Mindfulness
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RESEARCH

Mindful Exploration of the Vulva Through the Mirror Exercise Increases Genital Self-Image in College Students

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Abstract

Objectives The mirror exercise, an intervention instructing women to mindfully self-observe their vulva, has been shown to improve sexual functioning in clinical populations when couched within larger interventions. The current study examined the efficacy of this exercise *in isolation* in a non-clinical population (college students), as well as the role of mindfulness in predicting intervention benefits.

Method Participants ($n = 415$; after exclusion criteria) were undergraduates who self-reported having a vulva. They were randomly assigned to the vulva mirror exercise or a control condition (foot exercise), then divided by whether mindfulness instructions were present vs. absent (four total conditions: two exercise types x two mindfulness instructions). Before and after the intervention, participants completed online questionnaires measuring vulva self-image (VSI) and state mindfulness, the latter consisting of retrospective reports about mindfulness experienced during the exercise.

Results Participants in the vulva condition showed larger improvements in vulva self-image than participants in the foot condition ($\beta = 0.06$, $p = 0.025$), and significant increases in VSI pre- vs. post-intervention ($d = 0.25$, $p < 0.001$). Although there was not a significant effect of mindfulness instructions on vulva self-image at the group level, at the individual level, participants who reported being more mindful during the exercise showed larger benefits from the vulva mirror intervention ($\beta = 0.11$, $p = 0.003$).

Conclusions Our findings provide preliminary efficacy of the vulva mirror exercise on improving vulva self-image among healthy young adults and highlight the importance of cultivating a mindful, non-reactive stance while engaging in this exercise.

Preregistration The study design, hypotheses, and analyses were preregistered on the Open Science Framework (OSF): https://osf.io/f948t/.

Keywords Genital self-image · Mirror exercise · State mindfulness · Non-reactivity · Sex therapy

The way cisgender women perceive their genitals can have a profound impact on their mental and physical health. For example, correlational studies have shown that women who have positive feelings, attitudes and perceptions of their genitals (hereafter referred to as vulva self-image) report greater body image satisfaction (Malary et al., 2024) and body appreciation (Koçak & Aksoy, 2024). With respect to their sexual lives, these women also report greater sexual well-being (Gillen & Markey, 2019), sexual function (da Silva et al., 2024; Gillen & Markey, 2019, for reviews), self-esteem in sexual situations (Malary et al., 2024), sexual comfort (Fudge & Byers, 2020), and sexual satisfaction (Komarnicky et al., 2019). In a converse fashion, women with lower vulva self-image tend to report sexual distress (Benabe et al., 2022) and less optimal sexual functioning, including lower sexual desire, arousal, satisfaction, and vaginal lubrication, as well as greater pain and more difficulties achieving orgasms (Berman & Windecker, 2008; Herbenick & Reece, 2010; Komarnicky et al., 2019). The finding that some women experience poor vulva self-image is likely linked to how women, in general, feel and talk about their

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genitals. Indeed, qualitative studies have shown that women often report feelings of embarrassment about their vulva and internal reproductive structures (DeMaria et al., 2019) and use strong negative language when discussing their vulva (Fahs, 2014; Mullinax et al., 2015). These negative attitudes about one's vulva are likely to affect health outcomes, such as preventing young women from seeking women's preventative health care (DeMaria et al., 2012, and see Holland et al., 2020 for discussion).

Despite evidence demonstrating that women's attitudes/perceptions about their vulva contribute to their well-being and sexual function (see Gillen & Markey, 2019 and da Silva et al., 2024 for reviews), the topic still receives only limited empirical attention (Berman & Windecker, 2008). The fact that vulva self-image is crucial to sexual well-being is demonstrated through sex therapy, which involves behavioral interventions to target sexual dysfunction. For many years, sex therapists have been using the "mirror exercise" (hereafter referred to as the "vulva mirror exercise") to help increase vulva self-image among women with sexual desire and arousal disorders. This exercise, which falls under the umbrella of general body awareness exercises developed for sex therapy (LoPiccolo & LoPiccolo, 1978), instructs women to self-observe their genitals with the aid of a handheld mirror. One of the goals of the exercise is to allow women to become more "in tune" with their bodies by taking an active role in exploring and experiencing one's own intimate body parts (Bitzer & Brandenburg, 2009; LoPiccolo & LoPiccolo, 1978).

The vulva mirror exercise also encourages women to adopt a mindful, nonjudgmental attitude in the present moment, which is thought to play a key role in improving their sexual well-being (Brotto & Basson, 2014; Brotto et al., 2008a, b, c). Indeed, the mindfulness component is considered a key feature of Brotto's version of the mirror exercise (Heiman & LoPiccolo, 1988; Brotto, 2022). This emphasis is well-supported, as researchers have gathered a wealth of evidence demonstrating the benefits of incorporating mindfulness into the treatment of women with sexual dysfunction (Brotto et al., 2008a, b, c). For example, mindfulness-based interventions have been shown to improve sexual distress, rumination about sex, and relationship satisfaction (Brotto et al., 2021). With respect to women without sexual dysfunction, mindfulness has been shown to enhance sexual desire and arousal (e.g., Dickenson et al., 2019; Silverstein et al., 2011). These findings suggest that mindfulness may be an important mechanism underlying the benefits of the vulva mirror exercise, which we expand upon, below.

Conceptually, mindfulness involves paying attention to the present moment while cultivating nonjudgmental awareness towards one's thoughts, feelings, and surroundings (Kabat-Zinn, 1994; Segal et al., 2013). While some researchers characterize mindfulness as a unidimensional construct (e.g., Brown & Ryan, 2003), others propose a multifaceted structure. The Five Facet Mindfulness Questionnaire (Baer et al., 2006) operationalizes mindfulness along five dimensions: acting with awareness (i.e., paying deliberate attention to the present moment), nonjudging (i.e., accepting thoughts and emotions without criticism), observing (i.e., attending to internal and external experiences), describing (i.e., labeling internal experiences), and non-reactivity (i.e., allowing thoughts and emotions to come and go without attachment). Of particular relevance to body and vulva self-image is non-reactivity, which may be seen as an operationalization of acceptance (Baer et al., 2006). Indeed, higher levels of non-reactivity towards inner experience have been shown to predict greater body satisfaction among female college students through reduced thought suppression (Barrington & Jarry, 2019). Additionally, past research has found that women with higher trait levels of *describing* and *nonjudging* report higher vulva self-image and sexual satisfaction, as well as lower cognitive distractions during sex (Dunkley et al., 2015). Taken together, these findings suggest that fostering certain aspects of mindfulness, more than others, may help increase vulva self-image and overall body satisfaction.

Although the vulva mirror exercise has been used on its own in the clinic (see Heiman & LoPiccolo, 1988 for a collection of mindfulness-based exercises that includes the mirror exercise), many adaptations of the mirror exercise are couched in a larger intervention. Most of these interventions consist of multi-component treatments comprised of different techniques, including psychoeducation, body-centered interventions, cognitive-behavioral therapy, and couples therapy (see Bitzer & Brandenburg, 2009 for a review). For example, the vulva mirror exercise used in Lori Brotto's mindfulness-based group treatment for low desire and arousal includes psychoeducation, mindfulness training (including exercises focused on sexual sensations), and adaptations of sensate focus (Brotto & Basson, 2014; Brotto et al., 2008a, b, c, 2021; Paterson et al., 2017). Using this multi-component approach, Brotto et al. (2021) report quantitative improvements in sexual desire, arousal, sexual distress, and relationship satisfaction in women diagnosed with sexual dysfunction. However, because the intervention by Brotto et al. (2021) has multiple components, the unique effects of the vulva mirror exercise on sexual well-being – particularly on vulva self-image – remain unknown. Since this mindful vulva exploration exercise is easy to practice on one's own, demonstrating its efficacy in isolation would support its use as a standalone intervention for people without access to a full therapeutic program.

Thus, the primary goal of the current study was to test the efficacy of a 10-min vulva mirror exercise in improving vulva self-image in college-aged women. We chose this age group for two reasons. First, the vulva mirror exercise has been conducted almost exclusively in clinical populations

(i.e., women with sexual dysfunction), making it less generalizable to the broader population of women. Second, previous interventions have typically focused on relatively older, rather than younger, women. Targeting younger women instead could help prevent sexual issues later in life. To ensure that positive effects of the exercise were not the result of exploring *any* body part, a control condition was conducted in a separate set of participants who were instead instructed to explore their foot. We chose the foot, as we hypothesized that exploration of the foot and vulva might create similar levels of aversion.

A second goal of the current study was to investigate the role of mindfulness in three distinct ways. First, at the group level, we asked whether a condition that *removed* the mindfulness instructions resulted in less improvement in vulva self-image than Brotto's original condition that includes these instructions (Brotto, 2022). Second, we asked whether individual levels of self-reported state mindfulness (retrospective reports about the degree of mindfulness they experienced during the exercise) predict improvements in vulva self-image. Third, given that we expected to observe greater improvements in vulva self-image for women in the vulva mirror exercise vs. foot exercise condition, we conducted an exploratory analysis to ask whether these improvements could be accounted for by higher self-reported state mindfulness in the vulva condition.

Method

Participants

Participants were undergraduate students recruited through a pool run by the Psychology Department of the University of California, San Diego (UCSD). Students received academic credit in exchange for their participation in this research. In order to be eligible for the study, participants were required to self-report having a vagina/vulva, self-identify as female, have access to a handheld mirror (or the front-facing camera on a mobile device), and be in a private space while participating in the study. All participants were at least 18 years of age. Prior to commencing the study, participants read an online informed consent and agreed to participate in the study.

Sample Size

Sample size was determined by a priori power analysis conducted with G*Power based on the results from our pilot study, which showed improvements in vulva self-image for participants who were instructed to mindfully explore their genitals, as compared to those who were instructed to mindfully explore their foot (Cohen's $d = 0.43$). From this, it was determined that we would need a sample of approximately 400 to obtain a statistical power of 0.80. Because we expected about 50% attrition, based on what we observed in our pilot study, we aimed to recruit at least 800 participants. Data was collected during the Winter and Spring Quarters of 2024. The total number of participants was 894.

Exclusion Criteria

The following five exclusion criteria were implemented (see *preregistration* for further details). The *first* exclusion was an objective "attention check" to the items on the surveys. Specifically, in random places, participants were instructed to answer with a certain choice (e.g., "please select number 6 to show that you are paying attention"). If they failed any of these, they were excluded ($n = 95$). The next *four* exclusions were based on participants' self-reported levels of overall attention and compliance, which they were asked about at the very end of the study. This included the following: *One*, participants were excluded if they did not select the following response: "I read all instructions and questions carefully and answered honestly to the best of my ability" ($n = 210$). *Two*, participants were excluded if they reported not having read the handout that preceded, and was associated with, the 10-min exploration exercise (yes/no, $n = 22$). *Three,* participants were excluded if they reported not having performed the exploration exercise (yes/no, $n = 76$). *Fourth*, participants were excluded if they did not select the following response regarding the exercise: "I followed the instructions and participated the entire time to the best of my ability" ($n = 76$). We refer to these excluded participants as "non-compliers", noting that we were left with 415 (46.42%) "compliers" who were retained for our main analyses.

Procedure

General

This experimental study consisted of a fully factorial (i.e., between subjects) 2×2 design. The first factor was which exercise participants were instructed to participate in (with two levels: vulva mirror exercise vs. foot exercise), which we refer to as "exercise type". The second factor was instructions about being mindful during the exploration exercise (with two levels: present vs. absent), which we refer to as "mindfulness instructions". In this 2×2 design, participants were randomly assigned to one of the four conditions: (1) vulva mirror exercise (retained $n = 112$), (2) vulva mirror exercise without mindfulness instructions (retained $n = 110$), (3) foot exercise (retained $n = 102$), and (4) foot exercise without mindfulness instructions (retained $n = 91$). More detailed descriptions of each condition are presented below.

Note that the full script for each condition can be found in the Supplementary Information.

Vulva Mirror Exercise

This exercise was a prototypical mirror exercise adapted from Lori Brotto and colleagues' mindfulness-based sex therapy (Brotto, 2022; Brotto et al., 2021). Participants in this condition first read a handout containing information about the anatomy and function of the vulva and vagina, emphasizing appreciation of the different parts of the vulva.

Then, they were instructed to mindfully explore the different parts of their vulva using a handheld mirror for 10 minutes. Participants were encouraged to maintain a non-judgmental, mindful attitude (e.g., "allow your experience to simply be what it is, without trying to judge it or alter it in any way.").

Foot Exercise

Participants in this condition first read a handout containing information about the anatomy and function of the human foot. The handout was similar in length to the vulva handout, but was less imbued with language that promoted appreciation for the foot. After reading the handout, participants were instructed to engage in an exploration exercise with the same instructions as the Vulva Mirror Exercise, but targeting the foot, instead of the vulva. This condition included a set of instructions meant to elicit a mindful state, as above.

Vulva Mirror Exercise Without Mindfulness Instructions

This condition was identical to the Vulva Mirror Exercise, with the exception that the instructions to be mindful were deleted.

Foot Exercise Without Mindfulness Instructions

This condition was identical to the Foot Exercise condition, with the exception that the instructions to be mindful were deleted.

Protocol

Participants accessed the study through the participant pool in the Psychology Department. They signed the consent form online and then they were directed to a Qualtrics link that guided them through the study, which was conducted entirely online. Participants were then instructed to find a private place and have a handheld mirror nearby (or the front-facing camera of their cell phones) for the study. They were allowed to stop the survey before proceeding if they needed to change locations or grab their mirror. Participants were presented with a series of questionnaires (see *Measures,* below). First, they completed "baseline" measures, in the following order: state mindfulness, vulva self-image (VSI), and feet self-image (FSI).). In addition to these baseline measures, they rated their disgust towards their vulva and their feet.

After completing these questionnaires, participants began the intervention phase of the study (randomized to one of the four conditions, described above). For all conditions, they were instructed to read a handout and then engage in a 10-min exercise (timed over Qualtrics) of exploring either their vulva (which required the use of a mirror) or their foot (where they had the option of using a mirror or not).

After completing the 10-min intervention, participants once again completed measures of state mindfulness, VSI, and FSI. They then answered questions about their experience of the exercise (e.g., engagement/enjoyment in the exercise), whether they had any past experience using a mirror to view their vulva, and demographic questions. All survey items were required to be answered, so there was no missing data.

Measures

The following measures were collected in all conditions. All measures were adapted to a 7-point Likert response format to maintain consistency in resolution across items and to simplify the survey experience for participants (noting that this adaptation should have negligible effects on psychometric properties, see Alwin, 1997; Preston & Colman, 2000). For each measure, we averaged scores across items, regardless of the number of items within the scale. We report reliability estimates (i.e., Cronbach's alpha coefficients obtained in the current study) for all measures used in this study. All variables were visually inspected for normality and no variables showed extreme skew or kurtosis (cutoff value = 2).

Dependent Variables

Vulva Self-Image (VSI) Vulva self-image was measured with the Female Genital Self-Image Scale (FGSIS; Herbenick & Reece, 2010; Herbenick et al., 2011), which assesses feelings and attitudes towards one's vulva. Participants rated each item on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), with higher scores indicating higher vulva self-image. A sample item is "I feel positively about my genitals". The FGSIS has shown good psychometric properties and has been validated with female college samples (DeMaria et al., 2012). Cronbach's alpha coefficients for FGSIS at baseline vs. following the exercise were 0.87 and 0.89, respectively.

Feet Self-Image (FSI) Feet self-image was measured with an *in-house* questionnaire developed by the research team by adapting the FGSIS to target the feet, instead of the vulva. Participants rated each item on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), with higher scores indicating better feet self-image. A sample item is "I am satisfied with the appearance of my feet". Cronbach's alpha coefficients for FSI at baseline vs. following the exercise were 0.86 and 0.89, respectively.

State Mindfulness Measures

State Mindfulness Participants' levels of state mindfulness were assessed with the State Mindfulness Scale (SMS; Tanay & Bernstein, 2013). This 21-item questionnaire measures momentary levels of mindfulness and awareness during the exercise along two dimensions: mind and body. Participants rated each item on a 7-point scale ranging from 1 (*not at all*) to 7 (*very well*), with higher scores indicating higher levels of state mindfulness. A sample item is "I actively explored my experience in the moment". The SMS has satisfactory psychometric properties (Ruimi et al., 2022). The Cronbach's alpha coefficients for SMS at baseline vs. following the exercise were 0.97 and 0.96, respectively. This measure served as a manipulation check, allowing us to validate that our instructions to be mindful, indeed, resulted in participants reporting higher state mindfulness. State mindfulness scores were also used to predict VSI. Note that the SMS was administered pre- and post-intervention. When measured *pre*-intervention, participants were instructed to provide retrospective reports about the degree of mindfulness they experienced during the 10 min prior to joining the online study. When measured *post*-intervention, participants were instructed to provide retrospective reports about the degree of mindfulness they experienced while engaging in the exploration exercise.

State Non-Reactivity Non-reactivity towards one's body was measured with three *in-house* items adapted from the non-reactivity subscale of the Five Facet Mindfulness Questionnaire (FFMQ; Baer et al., 2006). It was measured only *post*-intervention (rather than both pre and post, as for the SMS, see above) as it was considered an exploratory variable. The FFMQ items were modified in two ways. First, they were rephrased to capture mindfulness as a state (vs. trait), with participants instructed to provide *retrospective* reports about the degree of mindfulness they experienced while engaging in the exploration exercise. Secondly, as opposed to asking about reactivity to thoughts and feelings (as in the FFMQ), the items specifically targeted thoughts and feelings about one's *body*. Participants rated each item on a 7-point scale ranging from 1 (*not at all*) to 7 (*very well*), with higher scores indicating higher levels of non-reactivity. The three items were: (1) "[During the exercise], I perceived my feelings and emotions about my body as a whole without reacting to them", (2) "I 'stepped back' and was aware of my thoughts about my body as a whole without being taken over by them", and (3) "I was able to just notice my thoughts about my body as a whole without reacting". The Cronbach's alpha coefficient was 0.84.

Descriptive Variables

Disgust Towards Genitals/Feet Disgust towards one's genitals and one's feet were assessed with two *in-house* items: (1) "How disgusted do you feel toward your genitals?" and (2) "How disgusted do you feel toward your feet?". Participants rated these two items on a 7-point scale that ranged from 1 (*not at all*) to 7 (*extremely*), with higher scores indicating higher disgust towards one's genitals/feet.

Exercise Engagement/Enjoyment Participant's levels of engagement and enjoyment of the exercise were measured with two *in-house* items: (1) "How engaged/focused were you during the exercise?" and (2) "How much did you enjoy the exercise?". Participants rated each item on a 7-point scale ranging from 1 (*not at all*) to 7 (*extremely*), with higher scores indicating higher engagement/enjoyment with the exercise.

Vulva Exploration Experience Participants' prior experience using a mirror to view their vulva was assessed with the following *in-house* item: "Have you ever used a mirror to look at your vulva in the past?" (response options: yes/no).

Demographic Variables Age, ethno-racial group, sex at birth, gender identity, and sexual orientation were collected for descriptive purposes.

Note that other variables were collected as part of the study (see OSF preregistration at https://osf.io/f948t/) in an effort to investigate correlates of vulva self-image. These data are not presented here.

Data Analyses

All statistical analyses were computed using *R* (Version 4.1.1; R Core Team, 2024). Basic descriptive analyses reported on means and standard deviations. Between-group differences in VSI were analyzed using multiple regression. VSI scores following the exercise were modeled as the dependent variable with baseline scores, exercise type (i.e., foot vs. vulva mirror exercise), mindfulness instructions (i.e., presence vs. absence), and the interaction between exercise type and mindfulness instructions as independent variables. Interaction terms that were not statistically significant were

dropped from the models. Because baseline levels of the dependent variable were entered as covariates to account for individual differences at baseline, a one-unit increase in the dependent variable can be interpreted as a one-unit change in scores following the exercise, accounting for baseline scores. Additionally, as preregistered, within-group differences of our dependent variables were analyzed with dependent t-tests to examine whether there were changes from baseline to following the exercise. To validate our mindfulness instruction manipulation, we conducted a multiple regression analysis. We also used regression analysis to assess whether state mindfulness (using the SMS and our *in-house* non-reactivity items) significantly predicted VSI following the vulva mirror exercise. Lastly, we conducted an exploratory mediation analysis using simulation-based inference to examine whether state mindfulness accounted for the effect of "exercise type" (vulva mirror exercise vs. foot exercise) on VSI. Estimates of the indirect effect were computed with the *mediation* package within R.

Results

Descriptive Statistics

Basic Demographics

All 415 participants retained for analysis self-reported being assigned female at birth and having a vagina/vulva. The average age of participants was 21.03 years ($SD = 2.96$). Regarding ethno-racial status, most participants self-identified as Hispanic/Latino (37.11%), followed by Asian (27.71%), White (19.28%), Mixed (8.92%), and Black/African American (2.65%). Regarding gender, 412 self-identified as "woman", 1 as "non-binary", and 2 as another gender (1 as "female/binary" and 1 identified as "woman/non-binary"). Regarding sexual orientation, 73% of participants self-identified as heterosexual, 23.86% as plurisexual (e.g., bisexual, pansexual), 2.17% as gay/lesbian, and 1% as other. Demographic differences between conditions were tested using independent samples t-tests for continuous variables (i.e., age) and chi-square tests of independence for categorical variables (i.e., ethno-racial status, gender, sexual orientation). The proportions of these demographics did not differ between women who participated in the vulva mirror exercise vs. the foot exercise (all t- and $\chi 2$-values < 7, all p-values > 0.10).

Baseline Attitudes and Previous Experiences

As stated in the *Introduction*, exploration of the foot served as a control condition to ensure that improvements in VSI were not due to exploring *any* body part. We chose the foot because we thought it likely that participants would feel equally averse to exploring their foot and vulva. In line with our intuition, participants' ratings of disgust towards their vulva ($M = 2.17$, $SD = 1.39$) and disgust towards their feet ($M = 2.16$, $SD = 1.48$) collected pre-intervention were relatively low (on a scale of 1 to 7) and did not differ from each other ($t(414) = 0.09$, $p = 0.932$).

With regard to the VSI scale, which was the primary variable of interest, baseline (i.e., before the intervention) scores for women who participated in the vulva mirror exercise ($M = 4.99$, $SD = 1.24$) and the foot exercise ($M = 4.98$, $SD = 1.20$) were moderate (midway on a scale of 1 to 7) and did not differ from each other ($t(413) = 0.06$, $p = 0.948$). Additionally, when asked to report at the end of the study whether they had previously explored their vulva with a mirror, 80.96% reported "yes", and this percentage did not differ between participants assigned to the vulva vs. foot conditions, χ^2 $(1, N = 415) = 0.89$, $p = 0.346$.

Engagement/Enjoyment in the Intervention

To explore participants' feelings about the exercise, we investigated how much enjoyment ("How much did you enjoy the exploration exercise" on a scale of 1 to 7) and engagement ("How engaged/focused were you during the exploration exercise?", on a scale of 1 to 7) participants reported regarding their experience. Participants who explored their vulva enjoyed the exercise ($M = 4.01$, $SD = 1.55$) and were significantly more engaged in the exercise ($M = 5.48$, $SD = 1.21$) than participants who explored their foot (enjoyment: $M = 3.48$, $SD = 1.51$; engagement: $M = 5.08$, $SD = 1.27$), $t(413) = 3.50$, $p < 0.001$, Cohen's $d = 0.34$, and, $t(413) = 3.29$, $p = 0.001$, Cohen's $d = 0.32$, respectively.

Is the Vulva Mirror Exercise Effective at Increasing Vulva Self-Image?

The main goals of the present study were (1) to determine whether a brief intervention commonly used in sex therapy – the vulva mirror exercise – increases vulva self-image when compared to an exercise in which participants were instructed to look at the foot, and (2) to assess whether removing instructions to be mindful decreases the effectiveness of the intervention. To test this, we conducted a Type II (i.e., simultaneous) multiple regression analysis, in which VSI scores following the exercise were modeled as a function of baseline VSI scores (i.e., before the intervention), exercise type (i.e., foot vs. vulva mirror exercise), mindfulness instructions (i.e., absence vs. presence of instructions), and the interaction between exercise type and mindfulness instructions. The interaction term was not significant ($p = 0.218$), and thus, we removed it from the model, in favor

of parsimony. The results, shown in Table 1, revealed a significant (yet small) main effect of exercise type ($\beta = 0.06$, $p = 0.025$), indicating that women who explored their vulva via the mirror exercise showed higher levels of VSI than women who explored their foot, irrespective of mindfulness instructions. However, there was no main effect of mindfulness instructions on VSI following the exercise ($\beta = 0.01$, $p = 0.856$), indicating that women who received instructions to be mindful had similar levels of VSI following the intervention as women who did not receive explicit instructions to be mindful.

Table 1 Regression Model with Changes in VSI Following the Exercise (DV) as a Function of VSI Before the Exercise, Exercise Type (Foot vs. Vulva Mirror Exercise), and Mindfulness Instructions (Absent vs. Present) (n = 415)

Predictor	β	β 95% *CI* [LL, UL]	p	Fit
Intercept			**< 0.001**	
VSI Baseline	0.86	[0.81, 0.91]	**< 0.001**	
Exercise Type (Foot vs. Vulva)	0.06	[0.01, 0.11]	**0.025**	
Mindfulness Instructions (Absent vs. Present)	0.01	[−0.04, 0.05]	0.856	
				$R^2 = 0.74$, 95% CI [0.70, 0.77]

Dummy coding was used for exercise type (0 = foot exercise, 1 = vulva mirror exercise), and mindfulness instructions (0 = absence of mindfulness instructions, 1 = presence of mindfulness instructions). β (beta) represents the standardized regression coefficient

Given that women who explored their vulva showed higher levels of VSI following the exercise than women who explored their foot, we then asked the more practically relevant question of whether women showed a significant change *before* vs. *after* the exercise. To address this, we first collapsed the data across mindfulness instructions (absent vs. present), separately for women in the vulva vs. foot condition, given that there were no effects of mindfulness instructions on VSI. We then computed a difference score for VSI (VSI before the exercise subtracted from VSI following the exercise), such that values greater than 0 indicate a numerical increase in VSI as a result of the intervention, and scores below 0 indicate a numerical decrease in VSI as a result of the intervention. The results, which are presented in Fig. 1, revealed that women who explored their vulva through the mirror exercise showed significant increases in VSI, ($t(221) = 3.67$, $p < 0.001$, Cohen's $d = 0.25$), while women who explored their foot did not ($t(192) = 0.65$, $p = 0.519$, Cohen's $d = 0.05$). Taken together, this analysis shows that the vulva mirror exercise significantly improves feelings about genital self-image, although the effect size may be small-to-moderate.

Did the Mindfulness Instructions Work to Increase Mindfulness?

The absence of an effect of mindfulness instructions on VSI (Table 1) could have resulted from the possibility that our instructions were not effective in cultivating a mindful state. To assess the validity of the manipulation, we conducted a Type II (i.e., simultaneous) multiple regression analysis modeling state mindfulness scale (SMS) following the intervention (i.e., participants' *retrospective* reports about

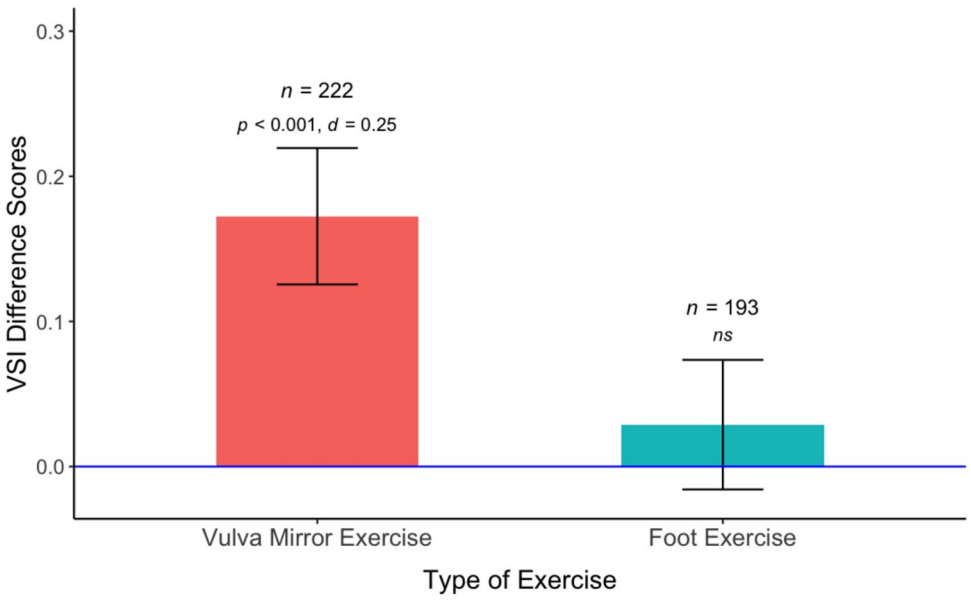

Fig. 1 VSI Difference Scores (After the Exercise – Before the Exercise) for Vulva and Foot Groups. *Note*. T-tests of VSI difference scores collapsing across mindfulness instructions. VSI was measured with the FGSI Scale. VSI difference scores are calculated as the change in VSI before vs. after the exercise. Values in the graph greater than 0 represent a numerical increase from baseline to following the exercise

the degree of mindfulness they experienced while engaging in the exploration exercise) as a function of baseline SMS scores (i.e., participants' *retrospective* reports about the degree of mindfulness they experienced before starting the intervention), exercise type (i.e., foot vs. vulva mirror exercise), mindfulness instructions (i.e., absence vs. presence), and the interaction term between exercise type and mindfulness instructions. The interaction term was not statistically significant ($p = 0.362$), and thus, it was dropped from the model, favoring parsimony. The results of this analysis (shown in Table 2) revealed a main effect of mindfulness instructions ($\beta = 0.13$, $p = 0.005$), such that women who received explicit mindfulness instructions reported higher levels of state mindfulness during the exercise compared to women who did not receive such instructions. It therefore appears that our mindfulness instructions manipulation successfully worked to increase state mindfulness (or, alternatively, that the removal of mindfulness instructions successfully lowered levels of state mindfulness).

Interestingly, we also found a main effect of exercise type ($\beta = 0.21$, $p < 0.001$), such that women who explored their vulva via the mirror exercise reported higher levels of state mindfulness than women who explored their foot. Because there was no interaction between exercise type and mindfulness instructions, we can say that the effect of exercise type did not significantly differ between the two levels of mindfulness instructions. This was further confirmed in post-hoc regression analyses showing that SMS scores were higher in the vulva (vs. foot) exercise in both the presence ($\beta = 0.24$, $p < 0.001$) and absence ($\beta = 0.17$, $p = 0.013$) of mindfulness instructions. This result suggests that the act of exploring one's vulva may naturally inspire feelings of mindfulness, which becomes relevant in our exploratory analyses, below, in which we ask whether greater improvements in VSI for women in the vulva vs. foot group may be accounted for (i.e., mediated) by state mindfulness.

Table 2 Regression Model with SMS Following the Exercise (DV) as a Function of State Mindfulness (SMS) Before the Exercise, Exercise Type (Foot vs. Vulva Mirror Exercise), and Mindfulness Instructions (Absent vs. Present) ($n = 415$)

Predictor	β	β 95% *CI* [LL, UL]	p	Fit
Intercept			**< 0.001**	
SMS Baseline	0.31	[0.22, 0.40]	**< 0.001**	
Exercise Type (Foot vs. Vulva)	0.21	[0.12, 0.30]	**< 0.001**	
Mindfulness Instructions (Absent vs. Present)	0.13	[0.04, 0.22]	**0.005**	
				$R^2 = 0.14$, 95% *CI* [0.08, 0.20]

Dummy coding was used for exercise type (0 = foot exercise, 1 = vulva mirror exercise), and mindfulness instructions (0 = removal of mindfulness instructions, 1 = presence of mindfulness instructions). β (beta) represents the standardized regression coefficient

With the knowledge that mindfulness instructions showed a significant impact on state mindfulness, we are left with two other explanations for the null effect of mindfulness instructions on VSI. First, it may be that although our manipulation was effective at increasing mindfulness, mindfulness simply does not affect VSI. Second, it may be that mindfulness does affect VSI, but our manipulation simply did not increase mindfulness *enough* to observe its benefits at the group level. Given that naturally occurring variations in state mindfulness create a greater range of mindfulness levels, it might instead be possible to observe the effects of mindfulness on VSI by using *individual* differences in state mindfulness rather than group differences of mindfulness instructions, which we turn to below.

Are Individual Levels of State Mindfulness Associated with VSI?

Having demonstrated that the vulva mirror exercise provides benefits in VSI over and beyond those of the foot control (Fig. 1) and having found no effect of mindfulness instructions (Table 1), the following analyses were conducted solely on participants who engaged in the vulva mirror exercise, combining data across the two levels of mindfulness instructions (absent vs. present, n = 222). Here, we conducted a Type II (i.e., simultaneous) multiple regression analysis in which VSI scores following the exercise were modeled as a function of baseline VSI scores (i.e., before the intervention) and state mindfulness (SMS) scores (i.e., participants' *retrospective* reports about the degree of mindfulness they experienced while exploring their vulva). The results, presented in Table 3 (*left panel*), revealed a significant (yet small) effect of SMS on VSI ($\beta = 0.11$, $p = 0.003$), indicating that participants who experienced higher levels of state mindfulness while engaged in the vulva mirror exercise showed greater VSI than participants who experienced lower levels of state mindfulness.

To visualize these effects, Fig. 2 presents a scatter plot of VSI difference scores (i.e., VSI score after the intervention – VSI before the intervention; values greater than 0 indicate that VSI was higher after having explored their vulva) as a function of retrospectively reported state mindfulness about their experience while engaged in the vulva mirror exercise.

The r-value was 0.15, which is small but significant ($p = 0.021$), mirroring the results of the regression analysis reported in Table 3 (left panel). To illustrate that the range in individual levels of state mindfulness was much greater than group-mean level differences driven by mindfulness instructions, we show mean mindfulness scores for women

Table 3 Regression Model with VSI Following the Vulva Mirror Exercise (DV) as a Function of VSI Before the Vulva Mirror Exercise, Retrospective Reports of State Mindfulness (SMS), and Retrospective Reports of the Non-Reactivity Facet of Mindfulness ($n = 222$)

Predictor	Predictive Model			Incremental Model		
	β	*β* 95% *CI* [LL, UL]	*p*	*β*	*β* 95% *CI* [LL, UL]	*p*
Intercept			0.049			0.722
VSI Baseline	0.83	[0.76, 0.90]	**< 0.001**	0.82	[0.75, 0.89]	**< 0.001**
SMS	0.11	[0.04, 0.18]	**0.003**	0.03	[−0.05, 0.11]	0.468
Non-reactivity				0.14	[0.05, 0.22]	**0.001**
Overall R^2	0.73***			0.74***		

β (beta) represents the standardized regression coefficient. *** indicates $p < 0.001$

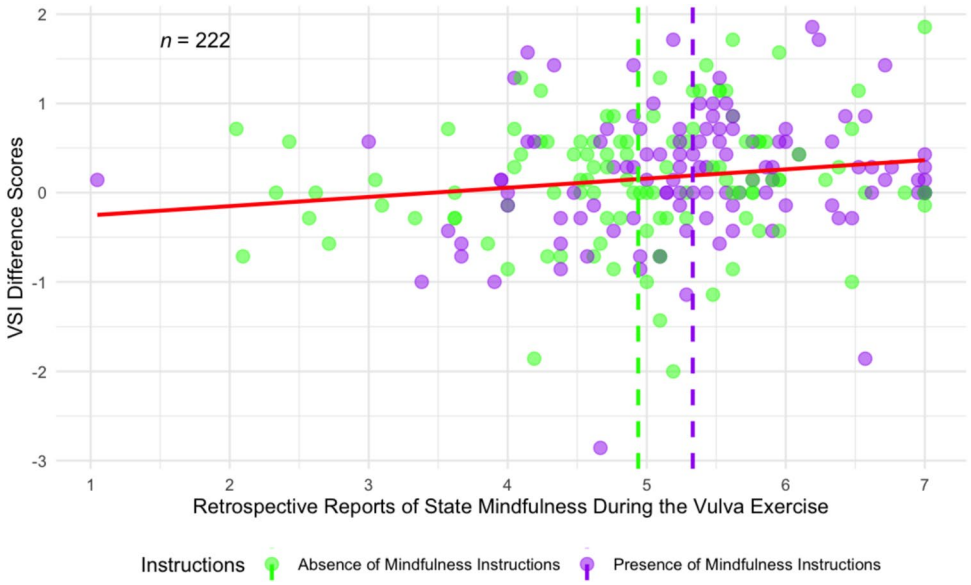

Fig. 2 VSI Improvement in the Vulva Mirror Exercise as a Function of Scores on the State Mindfulness Scale. *Note*. VSI difference scores are calculated as the change in VSI before vs. after the vulva mirror exercise. Values greater than 0 indicate a benefit on VSI as a result of the exercise. VSI and SMS scores range from 1 – 7. The solid line represents the line of best fit. Dashed lines represent SMS means for participants in the vulva mirror exercise condition who received mindfulness instructions and those who did not receive such instructions

in the mindfulness instructions present ($M = 5.33$, $SD = 0.99$) vs. absent ($M = 4.94$, $SD = 1.08$) conditions. We believe that it is the combination of (1) state mindfulness having a weak relationship with VSI ($r = 0.15$), and (2) mindfulness instructions not having a large effect on state mindfulness ($\beta = 0.13$, see above) that led to us finding a lack of an effect of mindfulness instructions on VSI, an issue we return to in the *Discussion*.

Because we found that state mindfulness was associated with increases in VSI, we conducted post-hoc analyses to investigate whether there was a significant benefit of being very *high* in mindfulness and a possible cost to being very *low* in mindfulness when exploring one's vulva. To address this practically relevant question, we restricted our analysis to women who scored very high (i.e., 1 *SD* above the mean: $n = 34$) and very low (i.e., 1 *SD* below the mean: $n = 31$) in state mindfulness, with the results presented in Fig. 3 (*left panel)*. The results revealed that women who were the most mindful showed a small-to-moderate (Cohen's $d = 0.39$) significant improvement in VSI following the vulva exercise (mean change = 0.29, $SD = 0.74$), ($t(33) = 2.25$, $p = 0.031$). By contrast, women who were the *least* mindful did not show a significant benefit of the vulva exercise (mean change = −0.08, $SD = 0.55$), ($t(30) = -0.84$, $p = 0.408$, Cohen's $d = 0.15$). In sum, a moderately sized benefit was seen in women who experienced high levels of state mindfulness, and fortunately, there was no obvious decrease in VSI in women who experienced relatively low levels of mindfulness during the vulva mirror exercise.

As explained in the preregistration, we explored whether "non-reactivity" – an *in-house* measure of mindfulness (based on the FFMQ; Baer et al., 2006) that was not captured on the SMS – was similarly related to increases in VSI as a result of the vulva mirror exercise. First, we verified that the zero-order correlation between the SMS and non-reactivity measure was not so strong to result in multicollinearity ($r = 0.57$, $p < 0.001$). We then repeated the abovementioned regression and added non-reactivity as a predictor variable. Results (shown in Table 3, *right panel*) demonstrated a significant (yet small) effect of non-reactivity on VSI ($\beta = 0.14$, $p = 0.001$) and the association between SMS and VSI following the intervention was no longer significant ($\beta = 0.03$, $p = 0.468$). We then performed a quantile analysis for non-reactivity (1 *SD* above the mean:

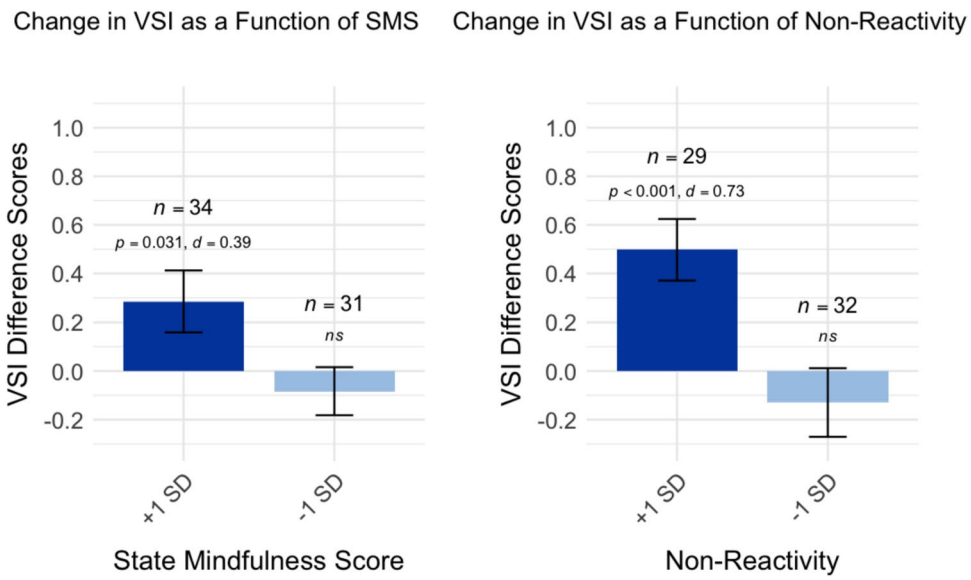

Fig. 3 Comparison of VSI Difference Scores between Participants who Retrospectively Reported High and Low Levels of State Mindfulness (*Left Panel*) and Non-Reactivity (*Right Panel*) while Engaged in the Vulva Mirror Exercise. *Note*. + 1 *SD* indicates 1 *SD* above the mean, and −1 *SD* indicates 1 *SD* below the mean. VSI difference scores are calculated as the change in VSI before vs. after the vulva mirror exercise. Values greater than 0 indicate a numerical increase in VSI as a result of the exercise. Error bars represent the standard error of the mean

$n = 29$, 1 *SD* below the mean: $n = 32$), as performed above for SMS. The results revealed that women who were the most non-reactive showed a large (Cohen's $d = 0.73$) significant improvement in VSI following the vulva mirror exercise (mean change = 0.50, $SD = 0.68$), ($t(28) = 3.93$, $p < 0.001$). By contrast, women who were the *least* non-reactive did not show a significant benefit of the vulva mirror exercise (mean change = −0.13, $SD = 0.80$), ($t(31) = 0.92$, $p = 0.366$, Cohen's $d = 0.16$). In sum, a large benefit was seen in women who experienced high levels of non-reactivity, and fortunately, there was no significant decrease in VSI in women who experienced relatively low levels of non-reactivity during the vulva mirror exercise.

Can the Greater Improvements in VSI for Women in the Vulva Mirror Exercise vs. Foot Exercise Be Accounted for by State Mindfulness?

In our above analyses (Did the Mindfulness Instructions Work to Increase Mindfulness?), we found that state mindfulness, as measured with the SMS, was significantly higher in the vulva mirror exercise vs. the foot exercise condition, and this was regardless of the presence vs. absence of mindfulness instructions. Given the observed positive relationship between SMS and VSI (Fig. 2 and Table 3, left panel), this raises the possibility that state mindfulness might account for VSI being higher for women in the vulva mirror exercise vs. foot exercise. To address this, we conducted an exploratory mediation analysis using simulation-based inference to assess whether the effect of exercise type (vulva mirror exercise vs. foot exercise) on VSI was reduced when SMS was included in the same model. Without SMS in the analysis, the effect of exercise type on VSI following the intervention had an effect size of $\beta = 0.06$ (Table 1). After adding SMS to the model, this effect became smaller and statistically non-significant ($\beta = 0.04$, $p = 0.100$). To conduct the simulation-based inference analysis, we employed the *mediation* package in R (Tingley et al., 2014), and included VSI at baseline as a covariate, to quantify the indirect effect. A 95% confidence interval (*CI*) of the indirect effect was computed via nonparametric bootstrapping using 1000 simulations. The results of the analysis confirmed that a significant indirect effect of exploring the vulva (vs. the foot) on changes in VSI following the intervention occurred through the level of state mindfulness achieved while engaged in the exercise (average causal mediation effect (ACME): 0.26; 95% *CI* [0.10, 0.51], $p < 0.001$). The proportion of the total effect accounted for by state mindfulness was 0.26. Although further evidence is needed to confirm a true mediation, these statistical findings suggest that state mindfulness might mediate the effectiveness of the intervention on VSI. That is, exploration of the vulva via the mirror exercise might naturally lead to increases in mindfulness, which in turn, improves VSI, an issue we return to in the *Discussion*.

Assessing Alternative Explanations of the Results

Are Our Results Due to Demand Characteristics? Exploring Differences in Feet Self-Image (FSI) Across Conditions

In the current study, we adapted the VSI into a new scale measuring one's feelings about their feet, referred to as feet self-image (FSI). Having such a measure allowed us to ask whether, in a reciprocal fashion to the VSI results above, FSI would be higher in the foot vs. the vulva condition. The analyses for this were identical to those employed for the VSI. The interaction term was not statistically significant ($p > 0.10$) and, thus, was dropped from the model. Results

from the regression analysis (Table 4) revealed that the main effects of exercise type ($\beta = 0.04$, $p = 0.185$) and mindfulness instructions ($\beta = 0.03$, $p = 0.324$) on FSI following the intervention were not statistically significant. The lack of an effect of the foot exercise on improving FSI suggests that exploration of any body part does not necessarily improve one's feelings about that body part. In addition, the lack of effect for FSI helps rule out the possibility that our observation of greater VSI for women in the vulva mirror exercise vs. foot exercise was not simply a demand characteristic. That is, if these improvements in VSI were solely due to participants feeling compelled to report an improvement, then we would expect to likewise have seen that FSI was greater for women in the foot vs. vulva mirror exercise, which we did not.

Discussion

The results of the current study conducted in a college sample reveal two main findings.

First, a simple 10-min vulva mirror exercise improves vulva self-image (VSI). Second, the extent of this improvement depends on how mindful people report feeling during the exercise. We turn to the significance of these findings, as well as limitations of the study, in the sections below.

The Effect of the Mirror Exercise

The results of the current study show, for the first time, that the isolated act of exploring one's vulva (using the mirror exercise) significantly increases VSI. This effect was over and above an active control of exploring one's foot, a body part that was matched in terms of feelings of disgust. This shows that improvements in vulva self-image as a result of participating in the vulva mirror exercise were not due to exploring *any* body part. We also think it unlikely that the benefit of the mirror vulva exercise is due to a demand characteristic (i.e., participants thinking they *ought* to say they feel better about their vulva after the exercise), since we did not find improvement in feet self-image (FSI) in participants who were asked to explore their foot. Although the absolute improvement in VSI from the mirror exercise was found to be small (Cohen's $d = 0.25$), it is in line with past research showing that single-session psychological interventions in the general population tend to yield small effects (see meta-analysis of van Agteren et al., 2021). Perhaps if participants were to engage in the vulva mirror exercise for a longer period or more frequently (e.g., several days a week), the benefit derived from this intervention would increase. In fact, it has been argued on theoretical grounds that small effect sizes, if reliably estimated, can accumulate over time, and eventually produce a large effect size (Funder & Ozer, 2019). In line with this claim, meta-analytical evidence has shown that longer vs. shorter well-being interventions result in stronger effects (Koydemir et al., 2021). Future research should investigate whether the effect of the mirror exercise can increase in magnitude with additional practice. Additionally, the observed effect size was smaller than anticipated. Future replication attempts will require larger sample sizes to achieve sufficient statistical power to detect differences between the vulva mirror exercise and foot exercise (or other body part) conditions.

The Importance of Being Mindful

In the current study, women who reported experiencing greater degrees of mindfulness while exploring their vulva showed larger improvements in VSI. This was observed for two different mindfulness measures. The first was a standardized scale called the State Mindfulness Scale (SMS; Tanay & Bernstein, 2013), which assesses the subjective experience of attention and awareness of present-moment experiences (both bodily sensations and mental events). The second was an *in-house* measure (3 items) that assessed

Table 4 Regression Model with Changes in FSI Following the Exercise (DV) as a Function of FSI Before the Exercise, Exercise Type (Foot vs. Vulva Mirror Exercise), and Mindfulness Instructions (Absent vs. Present) ($n = 415$)

Predictor	β	β 95% *CI* [LL, UL]	p	Fit
Intercept			**< 0.001**	
FSI Baseline	0.84	[0.79, 0.89]	**< 0.001**	
Exercise Type (Foot vs. Vulva)	−0.04	[−0.09, 0.02]	0.185	
Mindfulness Instructions (Absent vs. Present)	0.03	[−0.03, 0.08]	0.324	
				$R^2 = 0.71$, 95% *CI* [0.67, 0.74]

FSI = feet self-image. Dummy coding was used for exercise type (0 = foot exercise, 1 = vulva mirror exercise), and mindfulness instructions (0 = absence of mindfulness instructions, 1 = presence of mindfulness instructions). β (beta) represents the standardized regression coefficient

non-reactivity towards thoughts and emotions regarding one's body (e.g., "[During the exercise], I "stepped back" and was aware of my thoughts about my body as a whole without being taken over by them"). The non-reactivity items showed a stronger relationship with VSI improvement compared to the SMS. Moreover, for women in the *highest* quantile of non-reactivity, the effect size was quite large (Fig. 3, right panel, Cohen's $d = 0.73$). These results suggest that non-reactivity may be more important than attention and awareness for producing benefits from the vulva mirror exercise. However, these findings remain preliminary, as our measure of non-reactivity (adapted from the FFMQ; Baer et al., 2006) has not been formally validated. Furthermore, non-reactivity may not be a separate component of state mindfulness, as it did not load as a separate factor in a recent state-scale adaptation of the trait FFMQ (Raynes & Dobkins, 2025). Additionally, the current study did not test other aspects of mindfulness, such as non-judgment. It is possible that these other facets produce strong effects as well. Therefore, future research should more rigorously explore which specific mindfulness components work best to enhance VSI.

In addition to showing that the degree to which one cultivates a mindful and non-reactive stance when exploring their vulva predicts improvements in vulva self-image, our exploratory mediation analysis suggests that mindfulness may be mediating the greater VSI gains observed in the vulva condition, compared to the foot condition. That is, exploration of the vulva through the mirror exercise might naturally lead to increases in mindfulness, which in turn, improves VSI. This finding bolsters the notion that mindfulness is the important ingredient underlying the benefit. While our mediation analysis cannot establish true temporal precedence, we believe our proposed direction of causality (i.e., increases in state mindfulness lead to increases in VSI, rather than vice versa) is more parsimonious, not only because our measure of state mindfulness *preceded* the measure of VSI, but also because the state mindfulness questions specifically directed participants to reflect on their experience *during* the intervention itself. Still, future studies should employ other methods to shed light on the underlying mediating mechanisms (Pirlott & MacKinnon, 2016; Ge, 2023).

Limitations and Future Directions

Although the current findings are promising, there exist some limitations that can be addressed in future studies. First, despite our finding that higher levels of state mindfulness are associated with greater improvement in VSI following the vulva mirror exercise, we did not observe a group-level effect of mindfulness instructions on VSI. As explained in the results section, we believe this is due to our mindfulness manipulation not creating a large *enough* increase in mindfulness, in combination with the somewhat weak relationship between SMS and VSI, to show a group-level effect of mindfulness instructions on VSI. This is likely due to the fact that the only difference between the written mindfulness instructions was the presence vs. absence of a few sentences instructing participants to be mindful (see Supplementary Information), noting that we were trying to remain faithful to the original mindfulness wording of the Brotto exercise (which, likewise, contains only a few sentences about mindfulness). Future studies should test potentially stronger manipulations of state mindfulness, such as audio recordings where individuals are reminded the entire time to stay mindful.

Second, in the current study, while we make the claim that the degree to which one experiences a mindful state while exploring their vulva positively predicts improvements in VSI, we must entertain the possibility that this retrospective report (i.e., reflecting on their mindful state during the vulva mirror exercise using a validated scale of state mindfulness, i.e., SMS) partially reflected participants' trait, as opposed to state, mindfulness. We think, however, that this cannot fully account for our results for two reasons. First, the SMS has been validated as a state vs. a trait measure of mindfulness (and see Raynes & Dobkins, 2025 for similar statistical analyses supporting the state-like nature of the newly created state-4FMQ). Second, in the current study, we found that participants' mindfulness levels increased from baseline to following the intervention in both the vulva mirror exercise ($t(221) = 10.08$, $p < 0.001$), and foot exercise ($t(192) = 2.80$, $p < 0.01$) conditions, and this change is suggestive of the state- vs. trait-like nature of the SMS. Nevertheless, we recommend that future researchers incorporate a measure of trait mindfulness to better distinguish between state and trait effects.

Third, while the current study shows that the vulva mirror exercise increases VSI, we do not know the *specificity* of this effect. That is, it may be that the exercise affects other variables not explored in this study, such as other body-related attitudes. Future research should investigate whether the effects of the exercise are specific to vulva self-image or transfer to broader attitudes towards one's body.

Fourth, it is important to point out that another reason why we might have observed higher VSI in the vulva vs. the foot condition is that the *reading handout* in the vulva condition was imbued with more appreciative language than in the foot condition. However, we believe this unlikely to be the case since in our previous pilot study (reported in the preregistration), we found that reading the vulva handout in isolation did not produce a bigger improvement in VSI compared to the foot exercise. Instead, it was the combination of reading the vulva handout and the subsequent exploration exercise that led to significant improvements in VSI over the foot exercise. Nevertheless,

it will be important for future research to ensure equivalent emotional tone and sentiment across both experimental and control condition materials. Most importantly, the practical value of the current study lies in the pre- to post-intervention improvements we observed within the vulva mirror exercise group. These within-group changes demonstrate that the intervention enhances vulva self-image, which is the key outcome of clinical relevance.

A final limitation is that our sample was comprised of college students, which limits the external validity of the results. Additionally, we did not collect data on participants' levels of sexual function. Thus, our work cannot speak about the benefits of the mirror exercise in women who have been diagnosed with sexual dysfunction. Moreover, it remains unknown whether similar results would be obtained in other populations, such as individuals of different ages and ethnicities, as well as in people of different sexual orientations, sexual functioning, etc. As such, future studies should test the effects of the vulva mirror exercise on VSI across different demographics. In addition, while the current study worked with people who possess *a vulva* (and nearly all identifying as being a woman), future studies could examine whether the mirror exercise exerts similar benefits on genital self-image in people with different gender identities (e.g., people with female genitalia who identify as non-binary or identify as a man) or different genitalia (e.g., people with a penis). These and many different variables are likely to affect one's feelings about their vulva, and they may interact in ways hitherto unexplored. Future research should investigate such possibilities.

Despite these limitations, the findings of the current study provide clear evidence that the vulva mirror exercise, as adapted from standard interventions in sex therapy (e.g., Brotto et al., 2021), enhances vulva self-image. This suggests that the mirror exercise, as it is conducted in sex therapy (as a single session) can be a potent driver to increase self-esteem towards one's vulva. Additionally, fostering a mindful state while engaging in this experience appears to increase the derived benefit of this exercise. Based on these findings, we recommend that practitioners emphasize cultivating acceptance and non-reactivity when introducing the vulva mirror exercise to young adults, as these components appear particularly important for improving vulva self-image. The results of this study validate clinicians' experience that the mirror exercise is a promising avenue to increase vulva self-image. While this intervention could potentially be helpful for both clinical and nonclinical populations, our findings are based on a nonclinical sample, and more research is needed to explore the efficacy of the mirror exercise in individuals with sexual dysfunction.

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Author Contributions Silvia Gregori-Labarta: Conceptualization, Methodology, Data Curation, Formal Analysis and Investigation, Writing – Original Draft Preparation, Writing – Reviewing and Editing. Janna Dickenson: Conceptualization, Methodology, Writing – Original Draft Preparation, Writing – Reviewing and Editing, Supervision. Karen Dobkins: Conceptualization, Methodology, Writing – Original Draft Preparation, Writing – Reviewing and Editing, Supervision.

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Data Availability All data are available at the Open Science Framework (https://osf.io/2ny5b).

Declarations

Use of Artificial Intelligence Artificial intelligence was not used in the preparation of this manuscript.

Ethics Statement This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Institutional Review Board of University of California, San Diego (IRB approval: #806057).

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

Conflict of interest The authors declare no competing interests.

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