Positive Psychological Interventions for Sexual (Dys)Function and Their Efficacy: A Systematic Review and Meta-Analysis

Christel A. Bomhof

Faculty of Behavioural, Management and Social Sciences (BMS), University of Twente

Master's Thesis

Dr. J. Piano Simões, Dr. T.R. Vaessen

December 22, 2023

Positive Psychological Interventions for Sexual (Dys)Function and Their Efficacy: A Systematic Review and Meta-Analysis

Abstract

Introduction. Current psychotherapies for sexual health focus mainly on pathology, while sexual health's definition pertains to well-being. A focus on well-being is inherent to positive psychology, which might be better fitting in treating sexual function. *Aims*. This research aimed to uncover PPIs' effectiveness on sexual function and positive well-being compared to psychotherapies and waiting-list conditions. *Methods*. This review received no funding and was preregistered in PROSPERO (ID: 429755). Studies investigating PPIs were included from databases Scopus, Web of Science, PsycINFO, PubMed and ICTRP on December 12th 2023, if they had a randomised-controlled or quasi-experimental design. Risk of bias was assessed using the Cochrane ROB2 tool. Data was synthesised in forest plots following the random effects model. *Results*. Twenty-six studies yielded a total of 29 effect sizes and 2,165 participants. In heightening sexual function, PPIs were superior to no intervention (-), as well as treatment as usual (-). Merely, one study measured positive well-being. The outcomes are facing heterogeneity and were mostly reliant on and supportive of mindfulness-based interventions and female participants. *Conclusions*. The results promisingly portray PPIs' potential to heighten sexual function. However, further research should enable an understanding of heterogeneity and generalised conclusions.

Keywords: positive psychological interventions, mindfulness, acceptance and commitment therapy, sexual function, meta-analysis, systematic literature review

Introduction

The classification system of the Diagnostic and Statistical Manual of Mental Disorder-V (DSM-V) refers to sexual dysfunction as a grouping of disorders that is characterised by the inability to respond sexually or experience sexual pleasure (American Psychiatric Association, 2013). Sexual disordering can be caused by psychogenic and/or organic factors. However, distinguishing between the two has been criticised and deemed unhelpful (Jannini et al., 2010), as sexuality is now most often understood as an interplay between biological, psychological and social factors (Avasthi et al. 2017; Nimbi et al., 2022). It has been estimated that sexual dysfunction is prevalent in 43% and 31% of women and men, respectively (Avasthi et al., 2017). Those who experience sexual dysfunction are also more likely to suffer from impaired relationship functioning (McCabe & Connaughton, 2017) and lower quality of life (Anderson, 2013; Stephenson & Meston, 2013). It is, therefore, imperative that sexual dysfunction is treated effectively.

Current treatment options for sexual dysfunction comprise pharmacotherapy, (non-)genital sensate focus, practical adjustments to sex life and psychotherapy (Avasthi et al., 2017). Psychotherapies available are cognitive behavioural therapy (CBT), marital therapy, sex therapy, systematic desensitization, educational interventions, sexual skills training, psychodynamic therapy, hypnotherapy and rational emotive therapy (Frühauf et al., 2013). Frühauf et al. (2013) have shown that these are moderately effective as compared with wait-list-controls in addressing symptom severity ($g = 0.58$) and sexual satisfaction ($g = 0.47$). A major flaw of the available therapies, however, is their predominant consideration of pathology, disease and symptoms, rather than positive sexual health and well-being (Anderson, 2013; Nimbi et al., 2022). The working definition of sexual health as given by the World Health Organization (2002) encompasses physical, emotional, mental and social states of well-being, which pertains to more than the sole absence of sexual disordering. Surprisingly, the current therapies for sexual dysfunction do not pursue this. Experiencing the positive resources of sexual pleasure, satisfaction and positive sexual self-esteem can significantly improve not only sexual health but also mental and physical health and thus improve overall well-being (Anderson, 2013). Most clinicians agree that moving away from a pathology-centred approach to sexuality, towards a well-being approach is necessary (Nimbi et al., 2022).

Positive psychology is an approach that aims to heighten well-being, rather than just diminishing stress and pathology. Seligman and Csikszentmihalyi (2000) defined positive psychology as “A science of positive subjective experience, positive individual traits, and

positive institution's promises to improve quality of life and prevent the pathologies that arise when life is barren and meaningless" (p. 5). In its second and current wave, positive psychology has matured from only targeting hedonic well-being, to also cultivating eudemonic well-being (Keyes, 2008; Lomas & Ivtzan, 2016). Therapies in line with the positive psychological approach are referred to as positive psychological interventions (PPIs) and can be described as "treatment methods or intentional activities that aim to cultivate positive feelings, behaviors, or cognitions" (Sin & Lyubomirsky, 2009, p. 468). The distinction between well-being and mental illness is portrayed by Keyes (2005) in what he calls complete or positive mental health and is later referred to as 'flourishing' within the Two-Continua Model (Keyes, 2007). The author proposes that mental well-being and illness are not on the same continuum but rather two related, distinct continua. Thus, decreasing mental illness does not necessarily result in well-being. The definitions of positive mental health and sexual health are similar, as both rely on more than just the absence of pathology, but rather the presence of resources, resilience and/or well-being (Keyes, 2005, 2007; World Health Organization, 2002). In conclusion, sexual health pertains to a state of well-being, while available (psycho)therapies aim for the mere absence of ill-being.

In understanding how positive psychology is and can be integrated into mental healthcare, Bohlmeijer and Westerhof (2021) propose that psychotherapies exist on a spectrum, depending on the primary target of barriers or resources for successful adaptation. While traditional interventions such as CBT target barriers to adaptation, positive psychology aims to build resources, such as functional cognitions, emotions and behaviours. PPIs can be singular or multicomponent; examples of the former are interventions regarding the best possible self, character strengths, optimism, gratitude, pleasurable experiences and the three good things exercise (Van Agteren et al., 2021). Even though the frameworks of mindfulness and acceptance and commitment therapy (ACT) were originally not designed as PPIs, their aims fall under the denominator of building resources (Bohlmeijer & Westerhof, 2021). Furthermore, both intervention types have been argued to be able to fulfil the role of second-wave PPIs (Howell & Passmore, 2018; Shapiro et al., 2016). Next to PPIs (singular and multi-component), ACT and mindfulness, Van Agteren et al. (2021) found that other resource-building psychotherapies are successful at heightening well-being, namely expressive writing, compassion and reminiscence interventions. These have also been successfully used as positive psychotherapies (Neff et al., 2007; Ruini & Mortara, 2022; Westerhof et al., 2010). In sum,

PPIs, ACT, mindfulness and interventions aimed at expressive writing, compassion and reminiscence can be used in line with positive psychology.

Past reviews regarding the treatment of sexual health and (dys)function have focused on psychological therapies in general (Frühauf et al., 2013; Mestre-Bach et al., 2022), as well as on mindfulness-based psychotherapies (Stephenson & Kerth, 2017). However, a broader review aggregating the evidence of PPIs' effectiveness on sexual function has not yet been conducted. All the while, positive psychology considers and targets well-being and recovery beyond simply symptom reduction (Bohlmeijer & Westerhof, 2021), which better fits the definition of sexual health (World Health Organization, 2002). The current review and meta-analysis aims to uncover what PPIs are used for treating sexual dysfunction or complaints and their effects on sexual function and positive well-being as compared to waiting-list conditions or other psychotherapies. By doing so, this review answers the following four research questions: Firstly, what PPIs, reported in scientific studies, are used to treat sexual dysfunction and which sexual disorders are they specifically used for? Secondly, what is the pooled effect of PPIs on sexual function reported in scientific studies? Thirdly, what is the pooled effect of PPIs for sexual function on positive well-being reported in scientific studies? Lastly, what are the different effects across the subgroups of sexual disorders, participants' gender and PPIs reported in scientific studies?

Methods

Data collection

The research questions were answered with a meta-analysis and systematic literature review, which was pre-registered in PROSPERO under the study ID 429755. The meta-analysis was reported following PRISMA guidelines (Page et al., 2021). As the use of multiple databases is preferable (Bramer et al., 2017), four databases were utilised in the systematic search; Scopus and Web of Science (Core Collection) were suitable because of their large multidisciplinary coverage, while PsycINFO and PubMed were used due to their specializations in psychology and biomedicine (including psychiatry; Gusenbauer & Haddaway, 2019). To reduce publication bias in the current research, a search was conducted in the International Clinical Trials Registry Platform (ICTRP) to identify not (yet) published research (McAuley et al., 2000). The search query in the text box below was deployed on December 12th, 2023, in the above-mentioned databases. Found studies were in- or excluded based on the criteria summarised in Table 1.

("positive psychology" OR "positive psychological intervention" OR "positive psychology intervention" OR "positive psychotherapy" OR "PPI" OR "mindfulness" OR "mindfulness-based cognitive therapy" OR

"acceptance?commitment therapy" OR "acceptance and commitment therapy" OR "well?being therapy" OR "positive cognitive behavio?ral therapy" OR "positive behavio?ral intervention" OR ("solution-focused" AND "therapy") OR "body?mind integration" OR "mind?body techniques" OR "gratitude intervention" OR (("positive body image" OR "positive narrative" OR "narrative exposure" OR "sexual mindfulness" OR "expressive" OR "body-based" OR "positive relationship enhancement" OR "positive interpersonal") AND (therapy))) **AND (**"sexual dysfunction" OR "sexual function" OR "sexual disorder" OR "sexual difficulty" OR "sexual impairment" OR "sexual problem*" OR "hypoactive sexual desire disorder" OR "female sexual interest/arousal disorder" OR "genito-pelvic pain/penetration disorder" OR "erectile disorder" OR "delayed ejaculation" OR "premature (early) ejaculation" OR "female orgasmic disorder" OR "male orgasmic disorder" OR "orgasmic disorder" OR "female arousal disorder" OR "vaginismus" OR "dyspareunia"**)**

Table 1

Inclusion and exclusion criteria for selecting studies

Inclusion	Exclusion
• Studies used a positive psychological intervention to heighten sexual function. • Studies used a control condition that was either passive or active, with the latter consisting of a psychological intervention without a positive psychological element (i.e., treatment-as-usual). • Studies used a randomised controlled trial or quasi-experimental design. • The study assessed either or both sexual function (*preferably operationalised as sexual function. In case of absence, measures of sexual well-being, sexual quality of life, sexual self-efficacy or sexual satisfaction are used*) or positive mental health (*preferably operationalised as (a combination of) psychological well-being, social well-being and/or emotional well-being. If not available, subjective well-being will be used*).	• There was no full text available of the study. • There was no English/Dutch translation available upon request. • The paper did not describe the original research. • The necessary data was not reported/retrievable. • Studies solely rely on pharmacotherapy, products, medical procedures and/or practical adjustments to sex life in the intervention or control condition.

Data extraction

The study selection was performed within the software package Covidence (Veritas Health Innovation, 2023). One reviewer (CAB) screened the search results for eligibility. First, the title and abstract were assessed to decide whether the studies aligned with the criteria. If the studies were not yet excluded, the papers went through the second phase of selection, in which the whole paper was read to determine the suitability of the study. When faced with uncertainty, the second reviewer (JPS) was asked to oversee the selection of the particular study. Per eligible

and thus included study, the relevant data were extracted manually and summarised using Excel by one reviewer (CAB) in line with the extraction list proposed in the research protocol. In the Excel file, it was recorded if the trial was focused on a specific sexual disorder and/or gender, and if so, which one. The study's design was recorded, as well as the used PPI and control conditions; it was listed whether an active or passive control was used. In the case of an active control, the specific intervention was described. Moreover, the used measures and the standardised mean differences (or data necessary for calculation) for both the primary outcomes of sexual function and positive mental health were noted, which were selected and recorded as described in Table 1. No restrictions were in place for the time points of assessments. If multiple time points were available, the latest one gained priority because this better portrays the longer-term effectiveness of the interventions. Other data that was recorded pertained to the authors' names, publication year, country of origin of the study and the number of participants. In the case of any missing data, the authors of the respective studies were e-mailed using the corresponding address reported in the paper. In case of a non-response, and the data were not convertible to a Hedges G effect size, the study was excluded.

Estimation of Bias in the Collected Data

To estimate whether biases were present, multiple tools were deployed. For publication bias, Egger's regression test was carried out to establish asymmetry in the funnel plot. This method assumes that small studies are more susceptible to publication bias, compared to larger ones (Harrer et al., 2021). Furthermore, the inclusion of low-quality studies could skew the data synthesis outcomes (Marušić et al., 2020). To estimate the quality of each of the included studies, one reviewer (CAB) used the Cochrane Risk of Bias 2 (ROB2) tool on the published papers to assess each study's quality (Sterne et al., 2019). To determine whether a study poses a high or low risk of bias or gives rise to some concerns, 22 signalling questions across five domains are used. The domains pertain to the risk of bias arising from 1. the randomization process, 2. deviations from intended interventions (focus was laid on the assignment to the intervention), 3. missing outcome data, 4. measurement of the outcome and 5. selection of the reported result. The decision tree of the fourth domain was altered because the self-reporting nature of outcome measures in all included studies resulted in the inability to blind the assessor. This has not been counted as introducing bias. In their guidance, Sterne et al. (2019) encourage altering domain judgement algorithms if appropriate.

Data analysis

Meta-analyses. Both the effects of PPIs on sexual function and positive mental health should have been meta-analysed in comparison to an active and/or passive control. Concretely, this meant that there were four potential comparisons. The first two comparisons pertained to the effect on *sexual function* in the positive psychological intervention condition compared with both 1. the active controls or treatment as usual (TAU) and 2. the passive controls. All the while, the second two possible comparisons focused on the different effects on *positive mental health* between the positive psychological intervention conditions and both the 3. active and 4. passive control conditions. Instead of assuming a common effect underlying the data, it was assumed that there were other sources of variance, next to sampling error, such as different genders, PPIs and sexual disorders. Correspondingly, a random effects model was fitted to the data, as opposed to a fixed effects model (Borenstein et al., 2010). The effect sizes were measured using Hedges' G (Hedges, 1981). Where necessary, F-values were converted to Hedges' G using the R-package 'esc' (Lüdecke, 2019) or additional data was requested from the respective authors. If this proved to be unsuccessful and no effect sizes could be retrieved from the study, studies were excluded from the analysis (see Table 1). Effect size multiplicity was resolved according to López-López et al.'s (2018) guidance in order to reduce statistical dependency. Such data preparation is further discussed in the Results section. The restricted maximum likelihood estimator (Viechtbauer, 2005) was used for calculating the heterogeneity variance τ^2, while Knapp-Hartung (Knapp & Hartung, 2003) adjustments were implemented when calculating the confidence interval around the pooled effect. Time intervals were not accounted for in the model. An analysis was performed if two or more effect sizes were available per comparison. In the forest plot, the studies were ordered in increasing effect sizes and their risk of bias was displayed. The descriptive tables used the same order.

Sensitivity analyses. For the main meta-analyses, studies of all levels regarding their introducing a risk of bias were included. A sensitivity analysis was used to investigate whether studies with a high risk of bias skewed the outcome crucially or if it remained robust (Marušić et al., 2020). Concretely, this means that the meta-analyses were repeated while omitting the studies that were rated as having a high risk of bias according to the Cochrane ROB2 tool. Similarly, to investigate whether the pooled effect and heterogeneity were not subject to a disproportionate influence of outlying effect sizes, sensitivity analyses were executed without the outliers. Outliers were detected and removed through basic outlier removal (Harrer et al., 2021), in which an effect size is seen as outlying when its 95% confidence interval (95%CI)

does not partially overlap with the 95%CI of the pooled effect. If the sensitivity analyses would illustrate disparate results, the outcomes were interpreted with extra caution.

Subgroup analyses. Next to the meta-analyses and sensitivity analyses, subgroup analyses were performed. Sexual dysfunction and PPIs are not unitary concepts, as they are both umbrella terms. Investigating umbrella terms introduces clinical heterogeneity across included studies, which is quantifiable. In fact, investigation of the sources of heterogeneity can valuably contribute to the understanding under which conditions an intervention is effective (Gurevitch et al., 2018). To examine this, subgroup analyses were planned a priori, which has been recorded in PROSPERO. However, due to the exploratory nature of the subgroup analysis, no effect directions were hypothesised. The *first* subgroup analysis focused on uncovering whether PPIs' effects on sexual function and positive mental health were different depending on the *sexual disorders* treated. The sexual disorders were categorised according to the DSM-V. Likewise, the *second* subgroup analysis examined whether different effects were observed for PPIs on sexual function and positive mental health, depending on the *gender* of the participants. The current study, however, solely extracted information on the study level. Therefore, only the studies that limited their analysis to a specific gender (male/female/*if applicable:* non-binary) were included in the subgroup analysis to prevent ecological fallacy (Reade et al., 2008). *Lastly*, a subgroup analysis was conducted to investigate whether different types of *PPIs* had distinctive effects on sexual function and positive mental health. Where possible, the interventions were clustered according to Van Agteren et al.'s (2021) categorization of interventions. In their meta-analysis on well-being, the authors divided interventions into the categories of ACT interventions, mindfulness interventions, compassion interventions, expressive writing, multi-component PPIs, singular PPIs, reminiscence interventions, other interventions and cognitive therapy/CBT interventions. We appraised the latter intervention as an active control; in this respect, the current research deviates from Van Agteren et al.'s (2021) proposed classification. In short, three subgroup analyses were performed exploring the modifying effects of sexual disorder, participants' gender and PPIs.

For the three subgroup analyses, mixed-effects models were deployed (Harrer et al., 2021). Borenstein & Higgins (2013) motivate researchers to specify the exact mixed-effects model chosen. Thus, the chosen model was the 'random effects within, fixed effects between' model. The 'random effects within' model was found to be appropriate, as the effects underlying the subgroups were not assumed to be identical, while the 'fixed effects between' model was deemed most fitting, as no additional sampling error was introduced when defining

the subgroups because they comprehensively reflect all possible subgroups (Borenstein & Higgins, 2013). Summarily, a 'random-effects within, fixed effects between' mixed-effects model was performed for all three priori-defined subgroup analyses, which used sexual disorder, gender and PPIs as the predictors, while the effect sizes were the dependent variables. Different time intervals were not accounted for in the models.

Software. All the analyses were conducted with R (version 4.3.1; R Core Team, 2023) and RStudio (version 2023.06.0-421; Posit Team, 2023). Guidelines were followed according to Harrer et al. (2021), with the support of the following packages: tidyverse (Wickham et al., 2019), esc (Lüdecke, 2019), meta (Balduzzi et al., 2019), readxl (Wickham & Bryan, 2023), metafor (Viechtbauer, 2010), ggplot2 (Wickham, 2016) and gridExtra (Auguie, 2017).

Results

Study Sample and Characteristics

From the systematic literature search, a total of 26 studies met the inclusion criteria. The complete screening process has been summarised in the PRISMA flowchart in Figure 1. From these 26 studies, 30 effect sizes were yielded. Of these, 16 compared the experimental intervention with an active control (k = 16; n = 1,344), while 14 compared with a passive control (k = 14; n = 821). In the former, one study contributed two separate effect sizes, while in the latter two studies did. This effect size multiplicity was addressed using the guidance offered by López-López et al. (2018). When addressing the multiplicity for the studies with passive controls, the two participant groups called 'patient and partner group' and 'patient, partner and healthcare provider group' in the study done by Lin et al. (2019) were averaged, as both were informative but equivalent for the purposes of the current study. Combining the effect sizes affected the level of precision of the average effect size, but prevented a placebo group from being counted double and that additional weight was attributed to the same study in the meta-analysis. For the actively controlled studies, the studies of Krieger et al. (2023) and Halvaiepour et al. (2020) were both included twice, as they studied two gender groups and two intervention types, respectively. Due to the explorative nature of the review, López-López et al. (2018) advise to include both effect sizes but to differentiate between the two in subgroup analyses. This overlapped with the subgroup section of the analysis plan. After attending to multiplicity, 29 included effect sizes remained and were summarised in Tables 2 and 3. Moreover, almost all studies investigated sexual function as an outcome, while only some alternatively focused on sexual quality of life or sexual satisfaction. Surprisingly, only Shi et al. (2020) measured

positive well-being as framed in Table 1, in which the Index of Well-Being was used as an outcome measure.

Figure 1

PRISMA Flow Diagram

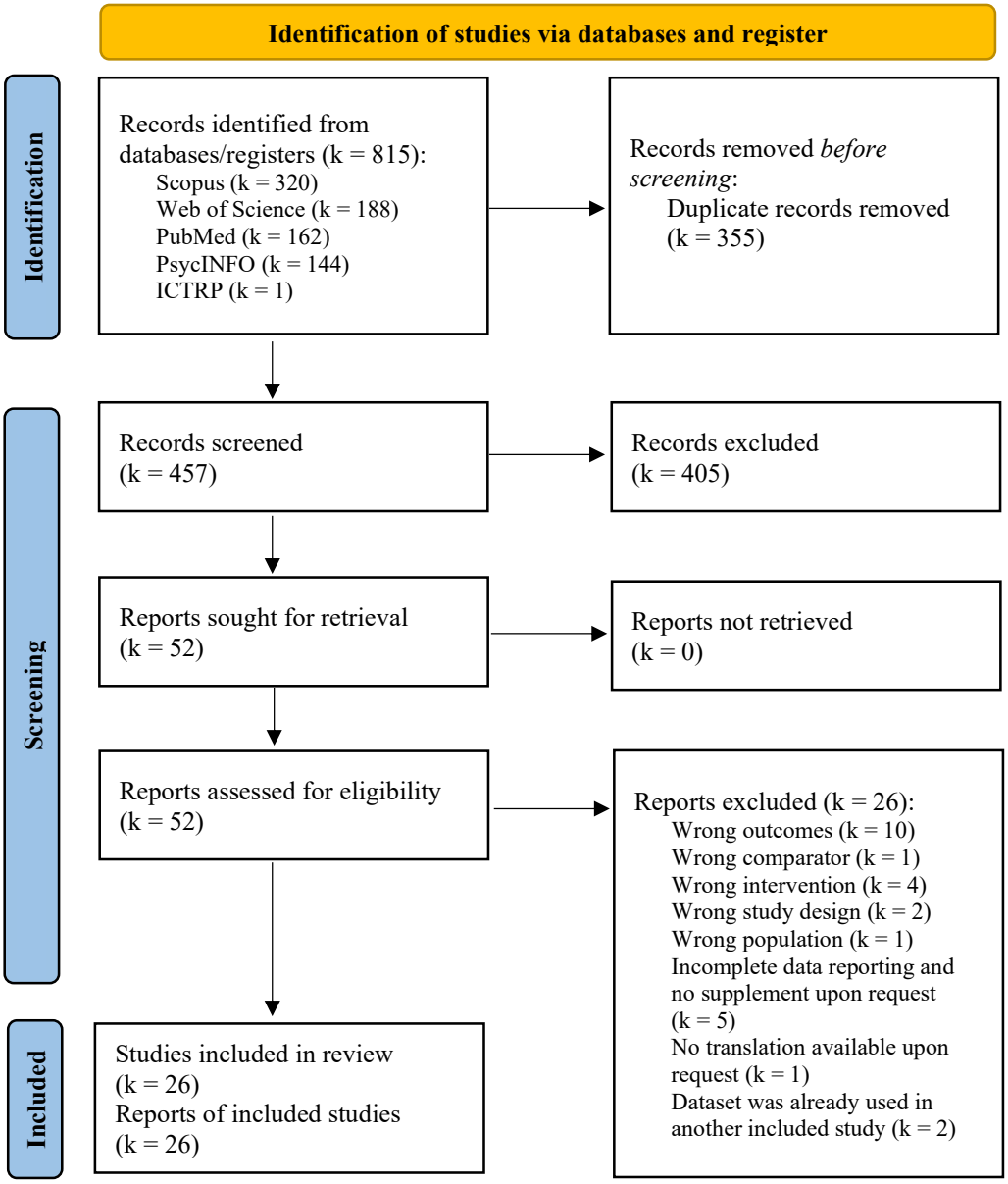

Table 2

Study Characteristics of Studies Comparing PPIs With TAU

Study	Study design	Country	Participants' gender (N)	Sexual disorder	Intervention (n; Classification according to van Agteren et al. (2021))	Active control (n)	Outcome	Other outcomes measured
1. -	-	-	-	-	-	-	-	-
2. -	-	-	-	-	-	-	-	-
3. -	-	-	-	-	-	-	-	-
4. -	-	-	-	-	-	-	-	-
5. -	-	-	-	-	-	-	-	-
6. -	-	-	-	-	-	-	-	-
7. -	-	-	-	-	-	-	-	-
8. -	-	-	-	-	-	-	-	-
9. -	-	-	-	-	-	-	-	-
10. -	-	-	-	-	-	-	-	-
11. -	-	-	-	-	-	-	-	-
12. -	-	-	-	-	-	-	-	-
13. -	-	-	-	-	-	-	-	-
14. -	-	-	-	-	-	-	-	-
15. -	-	-	-	-	-	-	-	-
16. -	-	-	-	-	-	-	-	-

Note. BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory-II; CSFQ-F = Changes in Sexual Function Questionnaire for Females; CSFQ-M = Changes in Sexual Function Questionnaire for Males; DAS-7 = Dyadic Adjustment Scale-7; FFMQ-SF = Five Facet Mindfulness Questionnaire-Short Form; FSDS = Female Sexual Distress Scale; FSDS-R = Female Sexual Distress Scale-Revised; FSFI = Female Sexual Function Index; GRA = Global Response Assessment; HADS = Hospital Anxiety and Depression Scale; IIEF = International Index of Erectile Function; ISS = Index of Sexual Satisfaction; MENQOL = Menopause-specific Quality of Life Questionnaire; MSQ = Multidimensional Sexuality Questionnaire; OSPI = O'Leary–Sant Symptom and Problem Index; PAIR = Personal Assessment of Intimacy in Relationships; PSEQ = Pain Self-Efficacy Questionnaire; SBAQ = Sexual Behaviors Assessment Questionnaire; SF-12 = 12-Item Short Form Health Survey; SQOL = Sexual Quality of Life; TAU = Treatment As Usual; VAS = Visual Analogue Scale; WHOQOL-BREF = Abbreviated Version of WHO Quality of Life.

Table 3

Study Characteristics of Studies Comparing PPIs With Passive Controls

Study	Study design	Country	Participants (N)	Sexual disorder	Intervention (n; Classification according to van Agteren et al. (2021))	Control (n)	Outcome	Other outcomes measured
1. -	-	-	-	-	-	-	-	-
2. -	-	-	-	-	-	-	-	-
3. -	-	-	-	-	-	-	-	-
4. -	-	-	-	-	-	-	-	-
5. -	-	-	-	-	-	-	-	-
6. -	-	-	-	-	-	-	-	-
7. -	-	-	-	-	-	-	-	-
8. -	-	-	-	-	-	-	-	-
9. -	-	-	-	-	-	-	-	-
10. -	-	-	-	-	-	-	-	-
11. -	-	-	-	-	-	-	-	-
12. -	-	-	-	-	-	-	-	-
13. -	-	-	-	-	-	-	-	-

Note. ATWGS = Attitude Towards Women's Genitalia Scale; BDI = Beck Depression Inventory; BIBCQ = Body Image after Breast Cancer Questionnaire; BIS = Body Image Scale; BSI-18 = Brief Symptom Inventory–18; CD-RISC-2 = Connor-Davidson Resilience Scale-2; DAS = Dyadic Adjustment Scale; DAS-7 = Dyadic Adjustment Scale-7; DASA = Detailed Assessment of Sexual Arousal; FACT-G = Functional Assessment of Cancer Therapy – General; FFMQ = Five Facet Mindfulness Questionnaire; FFMQ-SF = Five Facet Mindfulness Questionnaire Short Form; FSDS = Female Sexual Distress Scale; FSDS-R = Female Sexual Distress Scale-Revised; FSFI = Female Sexual Function Inventory; GAD-7 = Generalised Anxiety Disorder-7; GQ-6 = Gratitude Questionnaire-6; HADS = Hospital Anxiety Depression Scale; IIEF = International Index of Erectile Function; PRQC = Perceived Relationship Quality Components Inventory; PSS-4 = Perceived Stress Scale-4; RDAS = Revised Dyadic Adjustment Scale; SAGASF-F= Self-Assessment of Genital Anatomy and Sexual Function; SCL-90-R = Symptom Checklist-90 Revised; SDI-2 = Sexual Desire Inventory-2; SFQ = Sexual Function Questionnaire; SHS = Subjective Happiness Scale; SIDI = Sexual Interest and Desire Inventory; SIDI-F = Sexual Interest and Desire Inventory–Female; SSE = Sexual Self-Efficacy; SWLS = Satisfaction With Life Scale; WHOQOL-BREF = Abbreviated Version of WHO Quality of Life.

Bias in the collected data

To investigate publication bias, Egger's regression test, which is a measure of small study effect, was used to detect asymmetry in the funnel plots. Funnel plots were generated for studies that compared PPIs with active (see Figure 2), as well as passive controls (see Figure 3). With two non-significant Egger's tests (see Table 4), it may be assumed that the funnel plots are symmetrical. Therefore, there was no indication of a small study effect. In both funnel plots, a study is visibly asymmetrically outlying, which remained nonsignificant in Egger's regression. The effects of outlying studies are attended to below.

Figure 2

Funnel Plot and Egger's Test of Studies Comparing PPIs with TAU

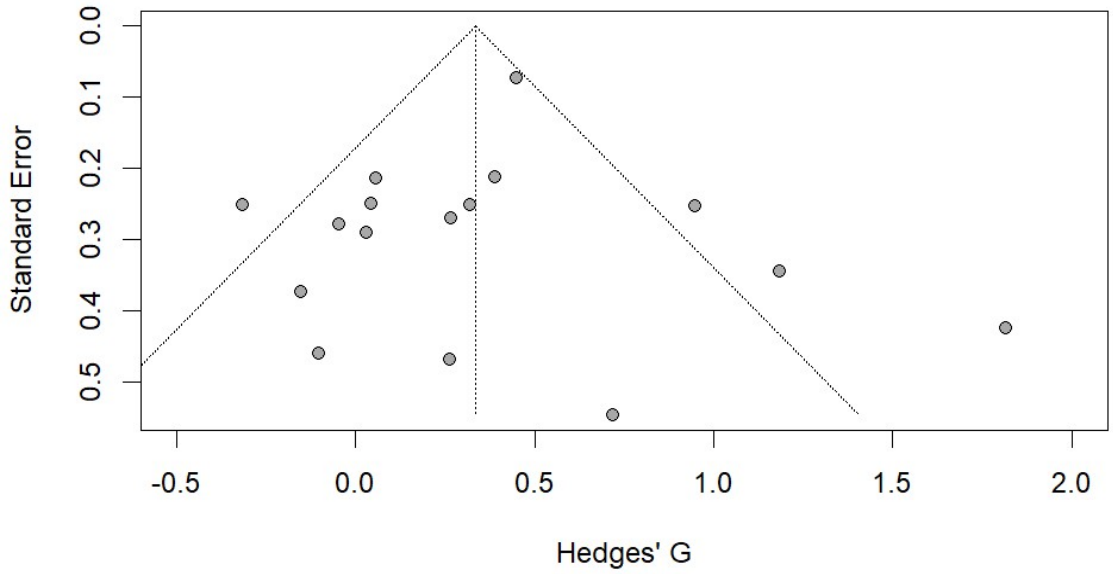

Figure 3

Funnel Plot and Egger's Test of Studies Comparing PPIs with a Passive Control

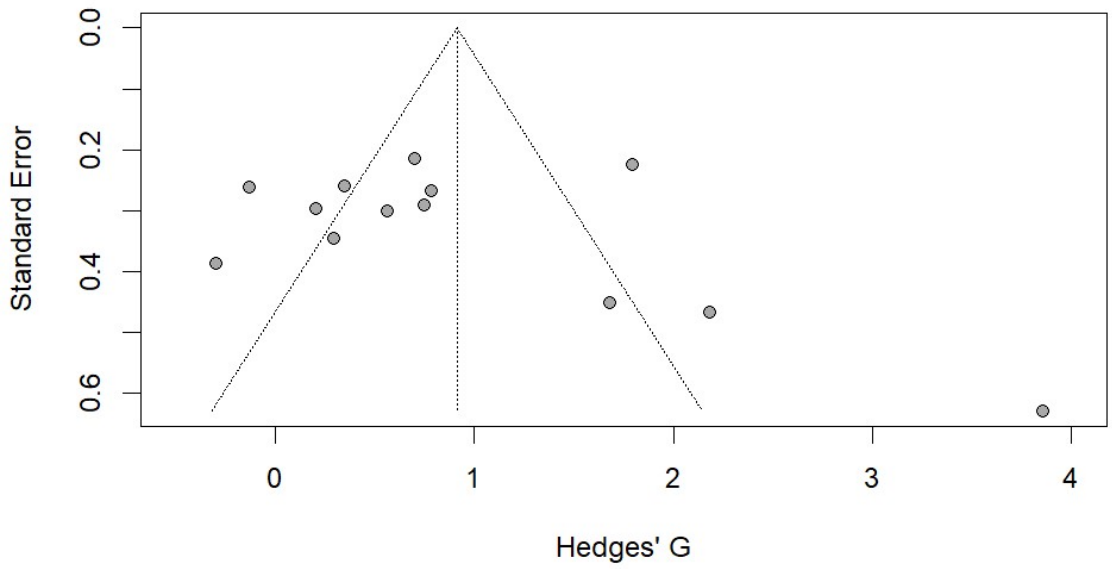

Table 4

Egger's Regression Test

	Intercept	95%CI	t	p
PPIs vs. TAU	-	-	-	-
PPIs vs. Passive controls	-	-	-	-

In assessing the quality of the included studies, and thus the internal validity of the current study, a risk of bias assessment was performed using the Cochrane ROB2 tool. The outcomes have been summarised in a traffic light fashion in Tables 5 and 6. Surprisingly, only five and six out of 26 studies introduced a low risk of bias and some concerns to the equation, respectively. Most studies reported limitations regarding the randomization process, missing data and deviating from the intended interventions (domains 1, 2 and 3). Measuring (domain 4) and reporting the outcomes (domain 5) seldom introduced bias in the included studies.

Table 5

Risk of Bias Assessment using the Cochrane ROB2 Tool for Studies Comparing PPIs with TAU

Study	ROB	D1	D2	D3	D4	D5
1. -						
2. -						
3. -						
4. -						
5. -						
6. -						

Table 5

Risk of Bias Assessment using the Cochrane ROB2 Tool for Studies Comparing PPIs with TAU

Study	ROB	D1	D2	D3	D4	D5
7. -						
8. -						
9. -						
10. -						
11. -						
12. -						
13. -						
14. -						
15. -						

Note. D1 = Domain 1 – the randomization process; D2 = Domain 2 – deviations from intended interventions (focus was laid on the assignment to the intervention); D3 = Domain 3 – missing outcome data; D4 = Domain 4 – measurement of the outcome; D5 = Domain 5 – selection of the reported result; ROB = risk of bias; = high risk of bias; = some concerns; = low risk of bias.

Table 6

Risk of Bias Assessment using the Cochrane ROB2 Tool for Studies Comparing PPIs with Passive Controls

Study	ROB	D1	D2	D3	D4	D5
1. -						
2. -						
3. -						
4. -						
5. -						
6. -						
7. -						
8. -						
9. -						
10. -						
11. -						
12. -						

Note. D1 = Domain 1 – the randomization process; D2 = Domain 2 – deviations from intended interventions (focus was laid on the assignment to the intervention); D3 = Domain 3 – missing outcome data; D4 = Domain 4 – measurement of the outcome; D5 = Domain 5 – selection of the reported result; ROB = risk of bias; = high risk of bias; = some concerns; = low risk of bias.

RQ 1: What PPI are Used and for Which Sexual Disorder

Of the 29 included effect sizes, 23 focused on mindfulness-based interventions. These interventions were most often deployed in samples that did not have a sexual disorder as described in the DSM-V (k = 13) but rather suffered from otherwise specified complaints. The mindfulness-based interventions were, however, also used for sexual interest and arousal disorder (k =8), female orgasmic disorder (k = 1) and genito-pelvic pain/penetration disorder (k = 1). Multi-component PPIs were used in three instances (k = 3), while ACT (k = 1) and relationship enhancement education and counselling (k = 1) were both only used once. All three aimed at heightening sexual functioning in otherwise described conditions than those included in the DSM-V. One study investigated the use of cognitive bias modification of interpretation (CBM) to heighten sexual functioning for women with sexual interest and arousal disorder. In summary, predominantly mindfulness-based interventions were investigated (k = 23), whilst otherwise specified conditions (k = 18) and women with sexual interest arousal disorder (k = 9) were most often treated in the included studies.

RQ 2: The Effect of PPIs on Sexual Function

The forest plot in Figure 4 summarizes the 16 effects of PPIs on sexual function compared with active controls. When pooling these, it became clear that the random effect was small, but significant (-). Moderate between-study heterogeneity was estimated at τ^2 = - (-), with an I^2 value of -% (-). The prediction interval ranged from g = - to -, meaning future negative effect sizes cannot be ruled out. Outlier detection prompted the omission of - et al.'s (-) study. After outlier removal analysis, heterogeneity remained, however, moderate (-) and the effect remained small and significant (-). In omitting the twelve studies that posed a high risk of bias, the pooled effect remained robust and small (-).

Figure 4
Forest Plot of the Effects of Studies Comparing PPIs with TAU on Sexual Function
-

The comparison of PPIs and passive controls on sexual function is summarised in Figure 5. Compared with no intervention, PPIs had a large significant effect on sexual function (-). Nevertheless, the large pooled effect contended with substantial between-study heterogeneity, as the τ^2 had been estimated at - (-) with an I^2 value of -% (-). In line with this, the prediction interval of g = - to - revealed that negative effect sizes cannot be deterred in the future. Upon outlier removal, which resulted in the omission of the MBCT effect size of - et al. (-), the between-study heterogeneity remained substantial (-). Meanwhile, the random effect shrunk to a significant moderate level (-). Furthermore, a sensitivity analysis confirmed the robustness of the pooled effect across risk of bias, as a large significant effect size remained (-).

Figure 5

Forest Plot of the Effects of Studies Comparing PPIs with Passive Controls on Sexual Function

-

Note. CBM = Cognitive Bias Modification; MBCT = Mindfulness-Based Cognitive Therapy.

RQ 3: The Effect of PPIs on Positive Well-Being

Only - et al. (-) measured positive well-being as indicated in Table 1 and found significant improvement due to their multicomponent PPI for sexual complaints. With one measurement, a meta-analysis appraising the effect of PPIs for sexual complaints on positive well-being was not possible.

RQ 4: The Difference in Effect on Sexual Function Between Subgroups

To investigate whether effects differ across sexual disorders, PPIs and gender, subgroup analyses were performed. The studies using active and passive controls were analysed separately. In most analyses, the subgroups were far from equivalent in size, with half of the groups only containing one or two effect sizes. In the actively controlled studies (see Table 7), the differences between the sexual disorder subgroups, consisting of sexual interest arousal disorder, female orgasmic disorder, genito-pelvic pain/penetration disorder and otherwise specified sexual complaints, were borderline non-significant. Regarding PPIs, a significant difference was found. The 'other' PPI group, consisting solely of a Relationship Enhancement Education and Counselling condition, yielded a higher effect, which was large and significant. There was, nevertheless, merely one study in this subgroup. Moreover, the mindfulness-based and multi-component PPI groups both aggregated to a small effect, but solely the former had a significant effect. Finally, in comparing gendered samples, there was a significant difference, with the small significant pooled effect only persisting in the female sample group.

Table 7

Subgroup Analyses (Mixed Effects Model) for the Active Controls Across Sexual Disorders, Gender and PPIs on Sexual Function

	g	95%CI	p	I^2	95%CI	$p_{subgroup}$
Sexual disorder						-
Other (k = 12)	-	-	-	-	-	
SIAD (k = 2)	-	-	-	-	-	
FOD (k = 1)	-	-	-	-	-	
GPPPD (k = 1)	-	-	-	-	-	
PPIs						-

Table 7

Subgroup Analyses (Mixed Effects Model) for the Active Controls Across Sexual Disorders, Gender and PPIs on Sexual Function

	g	95%CI	p	I^2	95%CI	$p_{subgroup}$
Mindfulness-based (k = 13)		-	-	-	-	
Multi-component PPI (k = 2)	-	-	-	-	-	
Other (REEC; k = 1)	-	-	-	-	-	
Gender						-
Female (k = 14)	-	-	-	-	-	
Male (k = 2)	-	-	-	-	-	

Note. FOD = Female Orgasmic Disorder; GPPPD = Genito-Pelvic Pain/Penetration Disorder; PPI = Positive Psychological Intervention; REEC = Relationship Enhancement Education and Counselling; SIAD = Sexual Interest Arousal Disorder.

For the studies with passive controls, the subgroup analyses were summarised in Table 8. The effect of PPIs on sexual function across sexual disorders, which covered sexual interest arousal disorder and otherwise specified sexual complaints, was non-significantly different. Contrarily, the PPI subgroups did differ significantly. The ACT, mindfulness-based and 'other' PPI groupings greatly and significantly affected sexual function. Meanwhile, the multi-component PPI group had no significant effect on sexual function. Likewise, the subgroups comparing genders did differ significantly; the female subgroup experienced a large significant effect on their sexual function, whereas the male subgroup experienced a negative small nonsignificant effect.

Table 8

Subgroup Analyses (Mixed Effects Model) for the Passive Controls Across Sexual Disorders, Gender and PPIs on Sexual Function

	g	95%CI	p	I^2	95%CI	$p_{subgroup}$
Sexual disorder						-
Other (k = 7)	-	-	-	-	-	
SIAD (k = 6)	-	-	-	-	-	
PPI						-
Mindfulness-based (k = 10)	-	-	-	-	-	
Other (CBM;	-	-	-	-	-	

Table 8

Subgroup Analyses (Mixed Effects Model) for the Passive Controls Across Sexual Disorders, Gender and PPIs on Sexual Function

	g	95%CI	p	I^2	95%CI	$p_{subgroup}$
k = 1)						
ACT (k = 1)	-	-	-	-	-	
Multi-component	-	-	-	-	-	
PPI (k = 1)						
Gender						-
Female (k = 12)	-	-	-	-	-	
Male (k = 1)	-	-	-	-	-	

Note. ACT = Acceptance and Commitment Therapy; CBM = Cognitive Bias Modification; PPI = Positive Psychological Intervention; SIAD = Sexual Interest Arousal Disorder.

Discussion

The current research aimed to systematically uncover, quantify and integrate the available evidence on the effectiveness of PPIs for sexual dysfunction on positive well-being and sexual function, compared with both waiting-list conditions and other psychotherapies. In most of the included studies, the effects of mindfulness-based therapies were investigated for treating sexual complaints not included in the DSM-V, as well as sexual interest arousal disorder to a lesser extent. The results suggest that PPIs can improve sexual function greatly and significantly when compared with no intervention (see Figure 5). For PPIs, a small, but still significant superiority remains in the effect on sexual function when compared with TAU (see Figure 4). This supports our notion that pathology-focused interventions for sexual function are less fitting compared to PPIs in their purpose of increasing sexual health, which entails a state of well-being rather than the absence of sexual complaints. Egger's regression and sensitivity analyses suggest that these outcomes are not observed due to small-study effects (see Table 4), low-quality studies or outliers. Another main finding is that the observed effect is different across types of PPIs and gender, but not sexual disorders (see Tables 7 and 8). The evidence is mainly available for and supportive of mindfulness-based interventions and women. Contrarily, the effect on positive well-being by PPIs for sexual function improvement was investigated only once. Therefore, no new aggregate information was uncovered through the current research for the effect on positive well-being.

Similar to our finding regarding sexual function, Carr et al. (2021) reported that PPIs were more effective than TAU, as well as no intervention, in treating depression, anxiety and

stress symptoms. The authors, furthermore, concluded that PPIs were also more effective in cultivating well-being. However, we found merely one study that included this as a measurement. Finding little well-being research with a focus on sexual health is in line with Van Agteren et al.'s (2021) findings for their systematic review on well-being heightening psychotherapies, as they found no studies on participants with sexual complaints. Moreover, our conclusion regarding mindfulness being effective for women corroborates Stephenson and Kerth's (2017) and Alahverdi et al.'s (2022) findings of improved sexual function through mindfulness for female sexual dysfunction. Within broader well-being research, Van Agteren et al. (2021) also found that mindfulness-based interventions were among the most frequently researched types of interventions, second only to PPIs, while also being effective. Surprisingly, our results were mostly available for, but also supportive of PPIs for women, whereas not for men. Little research is available on gender-based efficacy differences in PPI research; Rao and Donaldson (2015) concluded that female participants are overrepresented, while Thompson et al. (2014) identified women as a more suitable target audience than men, as they respond significantly better to PPIs than men. In the case of mindfulness interventions, women have been shown to benefit more than men in outcome measures such as self-compassion and negative affect (Rojiani et al., 2017). Comparably, sexual mindfulness is positively associated with sexual satisfaction in women, but not in men; it has been suggested to occur as a result of women's tendency to focus on their partner's pleasure rather than their own, while men have a better awareness of their physical arousal (Leavitt et al., 2019). Mindfulness interventions seem to further the concordance between subjective desire and genital arousal in women (Velten et al., 2017). Our findings, along with the limited existing research on the subject, indicate that PPIs and/or mindfulness affect men and women disparately.

Interpretation of the results should be done considering the inherent limitations of this research. While the current review is the first to cover the full scope of the available research on PPIs treating sexual (dys)function, it also uncovers research gaps, regarding male participants, various PPIs (e.g. compassion interventions) and numerous sexual disorders (e.g. male hypoactive sexual desire disorder), as these have been mostly or completely overlooked. Therefore, general conclusions about the effect of PPIs on sexual dysfunction *should be avoided*. As a result, the current outcomes give a promising portrayal of PPIs' ability to heighten sexual function, but is, with the lack of available evidence, not generalizable to all genders, disorders and PPIs. Additionally, of the included studies, only five introduced a low risk of bias. This shows that the quality of the available evidence falls short. The sensitivity analyses

ensured, however, that the effect remains robust when relying only on higher-quality evidence. Next to the limitations in the evidence used, there are also limitations in the review process. Our research framework exhibits clinical heterogeneity, illustrating the exploratory nature of this study. This aspect simultaneously acts as a strength given the novelty of the topic. Concretely, clinical heterogeneity was engendered by the comprehensive inclusion of all available PPIs, participants, genders, sexual complaints, measures, time points of measures, treatment intensities, treatment modalities and active comparators. The broad inclusivity allowed for the thorough examination of the available research but as a result, the measured heterogeneity was indeed substantial, even after dividing the data into subgroups on the basis of sexual disorder, PPIs and gender. Specifically, this signifies that, beyond these three aspects, no information is available on the characteristics that contribute to or suppress the impact of PPIs on sexual function. This furthers the point that current outcomes are preliminary evidence in favour of the effect of PPIs on sexual function but need further investigation. Moreover, no systematised measure is used to appraise the certainty of our outcomes; the GRADE approach is an example of such a measure (Schünemann et al., 2013), which is also recommended in the PRISMA guidelines (Page et al., 2021).

Based on this research, multiple recommendations can be made. For clinical application, it can be recommended that the use or addition of a mindfulness-based approach is considered for sexual complaints in women. There seems to be a sufficient body of evidence in and beyond this study that argues for this practice. As for future research, plenty of research gaps have been uncovered. Researchers are invited to contemplate studying the so far (mostly) overlooked PPIs (i.e. ACT, compassion interventions, reminiscence interventions, expressive writing, multi-component PPIs, singular PPIs), sexual disorders (i.e. female orgasmic disorder, genito-pelvic pain/penetration disorder, male hypoactive sexual desire disorder, erectile disorder, premature (early) ejaculation, delayed ejaculation) and male population suffering from sexual complaints. Additionally, especially when researching PPIs, the effect on both symptoms, *as well as* positive well-being, should be measured to enable the holistic appraisal of the intervention's impact (Keyes, 2007). Including a measure aimed at assessing positive mental health, such as the Mental Health Continuum – Short Form by Keyes (2008), in future research would facilitate such a holistic appraisal.

Conclusion

While the definition of sexual health matches positive psychology and PPIs, their effect on sexual (dys)function and positive well-being had never been systematically appraised. Through means of a systematic search, we found that, except for one, studies on PPIs for sexual complaints have paid no attention to the effect on positive well-being. As a result, the effects therein remain unclear. Nonetheless, through meta-analysing the effect of PPIs on sexual function, this study found that PPIs are more effective than no intervention in heightening sexual function. Even compared with TAU, PPIs remain superior in heightening sexual function. The generalizability of the conclusion is, however, limited, as we faced substantial heterogeneity in the observed effect. Moreover, the included research mainly focused on mindfulness-based interventions targeting female participants. Therefore, future research on PPIs' effect on sexual function should aim to focus on the so far overlooked PPIs, sexual disorders, male participants and assessment of positive well-being.

Supplementary Materials

The research protocol for the current study is preregistered with PROSPERO and is available under study ID 429755. The raw data files used were an Excel file for the extracted data and the RStudio code for the analyses and figure generation. These are available upon request.

Funding, Interests and Contributions

This research received no funding. The authors declare that there were no competing interests. Moreover, the authors' contributions are summarised according to the CRediT statement; **Christel A. Bomhof**: Conceptualization, Methodology, Software, Formal analysis, Investigation, Resources, Writing - Original draft, Writing – Review & Editing, Visualization, Project administration. **Jorge Piano Simões**: Software, Supervision, Resources, Writing – Review & Editing. **Thomas Vaessen**: Supervision.

References

Adam, F., De Sutter, P., Day, J. M., & Grimm, E. (2019). A Randomized Study Comparing Video-Based Mindfulness-Based Cognitive Therapy With Video-Based Traditional Cognitive Behavioral Therapy in a Sample of Women Struggling to Achieve Orgasm. *The Journal of Sexual Medicine, 17*(2), 312-324. https://doi.org/10.1016/j.jsxm.2019.10.022

Alahverdi, F., Shahbaztabari, N., Nayeri, R. D., & Nayeri, S. D. (2022). Effect of Mindfulness-based Intervention on the Treatment of Women's Sexual Dysfunction: A Literature Scoping Review. *Journal of Clinical and Diagnostic Research, 16*(6), 1–6. https://doi.org/10.7860/jcdr/2022/54896.16463

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

Anderson, R. M. (2013). Positive Sexuality and its Impact on Overall Well-Being. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz, 56*(2), 208–214. https://doi.org/10.1007/s00103-012-1607-z

Auguie, B. (2017). *gridExtra: Miscellaneous Functions for "Grid" Graphics* (R package version 2.3) [Computer software]. https://CRAN.R-project.org/package=gridExtra

Avasthi, A., Grover, S., & Rao, T. S. (2017). Clinical Practice Guidelines for Management of Sexual Dysfunction. *Indian Journal of Psychiatry, 59*(5), 91–115. https://doi.org/10.4103/0019-5545.196977

Bagherzadeh, R., Sohrabineghad, R., Gharibi, T., Mehboodi, F., & Vahedparast, H. (2020). Effect of Mindfulness-Based Stress Reduction Training on Revealing Sexual Function in Iranian Women With Breast Cancer. *Sexuality and Disability, 39*(1), 67–83. https://doi.org/10.1007/s11195-020-09660-1

Balduzzi, S., Rücker, G., & Schwarzer, G. (2019). How to Perform a Meta-Analysis With R: A Practical Tutorial. *Evidence-Based Mental Health, 22*, 153-160. https://doi.org/10.1136/ebmental-2019-300117

Bohlmeijer, E. T., & Westerhof, G. J. (2021). The Model for Sustainable Mental Health: Future Directions for Integrating Positive Psychology Into Mental Health Care. *Frontiers in Psychology, 12,* Article e747999. https://doi.org/10.3389/fpsyg.2021.747999

Bokaie, M., Hejazi, N., Jafari, M., & Shabani, M. (2023). Effect of Online Solution-Focused

Counseling on the Sexual Quality of Life of Women With a History of Breast Cancer: A Clinical Trial. *BMC Women's Health, 23*, Article e326. https://doi.org/10.1186/s12905-023-02468-z

Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2010). A Basic Introduction to Fixed-Effect and Random-Effects Models for Meta-Analysis. *Research Synthesis Methods, 1*(2), 97–111. https://doi.org/10.1002/jrsm.12

Borenstein, M., & Higgins, J. P. T. (2013). Meta-Analysis and Subgroups. *Prevention Science, 14*(2), 134–143. https://doi.org/10.1007/s11121-013-0377-7

Bramer, W. M., Rethlefsen, M. L., Kleijnen, J., & Franco, O. H. (2017). Optimal Database Combinations for Literature Searches in Systematic Reviews: A Prospective Exploratory Study. *Systematic Reviews, 6,* Article e245. https://doi.org/10.1186/s13643-017-0644-y

Brotto, L. A., & Basson, R. (2014). Group Mindfulness-Based Therapy Significantly Improves Sexual Desire in Women. *Behaviour Research and Therapy, 57*, 43–54. https://doi.org/10.1016/j.brat.2014.04.001

Brotto, L. A., Erskine, Y., Carey, M., Ehlen, T., Finlayson, S., Heywood, M., Kwon, J. S., McAlpine, J. N., Stuart, G., Thomson, S., & Miller, D. (2012). A Brief Mindfulness-Based Cognitive Behavioral Intervention Improves Sexual Functioning Versus Wait-List Control in Women Treated for Gynecologic Cancer. *Gynecologic Oncology, 125*(2), 320–325. https://doi.org/10.1016/j.ygyno.2012.01.035

Brotto, L. A., Zdaniuk, B., Rietchel, L., Basson, R., & Bergeron, S. (2020). Moderators of Improvement From Mindfulness-Based vs Traditional Cognitive Behavioral Therapy for the Treatment of Provoked Vestibulodynia. *The Journal of Sexual Medicine, 17*(11), 2247–2259. https://doi.org/10.1016/j.jsxm.2020.07.080

Carr, A., Cullen, K., Keeney, C., Canning, C., Mooney, O., Chinseallaigh, E., & O'Dowd, A. (2021). Effectiveness of Positive Psychology Interventions: A Systematic Review and Meta-analysis. *The Journal of Positive Psychology, 16*(6), 749–769. https://doi.org/10.1080/17439760.2020.1818807

Derakhshan, D., Ja'Farzadeh, L., & Solati, K. (2018). The Effectiveness of Mindfulness-Based Cognitive Therapy on Psychiatric Symptoms, Marital Satisfaction, and Sexual Function of Women aged 25-45 Years Old with Candidal Vaginitis in Shahrekord County. *Pakistan Journal of Medical & Health Sciences, 12*(4), 1813-1816.

Enjezab, B., Rejaezadeh, M., Bokaie, M., & Salimi, H. (2021). The Effectiveness of

Acceptance and Commitment Therapy (ACT) on Sexual Self-Efficacy and Sexual Quality of Life in Reproductive-Age Women: A Randomized Controlled Trial. *Journal of Sex & Marital Therapy, 47*(8), 764–772. https://doi.org/10.1080/0092623x.2021.1944938

Esplen, M. J., Wong, J., Warner, E., & Toner, B. B. (2018). Restoring Body Image After Cancer (REBIC): Results of a Randomized Controlled Trial. *Journal of Clinical Oncology, 36*(8), 749–756. https://doi.org/10.1200/jco.2017.74.8244

Frühauf, S., Barth, J., Schmidt, H. W., & Munder, T. (2013). Efficacy of Psychological Interventions for Sexual Dysfunction: A Systematic Review and Meta-Analysis. *Archives of Sexual Behavior, 42*(6), 915–933. https://doi.org/10.1007/s10508-012-0062-0

Gunst, A., Ventus, D., Arver, S., Dhejne, C., Görts-Öberg, K., Zamore-Söderström, E., & Jern, P. (2018). A Randomized, Waiting-List-Controlled Study Shows That Brief, Mindfulness-Based Psychological Interventions are Effective for Treatment of Women's Low Sexual Desire. *Journal of Sex Research, 56*(7), 913–929. https://doi.org/10.1080/00224499.2018.1539463

Gurevitch, J., Koricheva, J., Nakagawa, S., & Stewart, G. B. (2018). Meta-analysis and the Science of Research Synthesis. *Nature, 555*, 175–182. https://doi.org/10.1038/nature25753

Gusenbauer, M., & Haddaway, N. R. (2019). Which Academic Search Systems are Suitable for Systematic Reviews or Meta-Analyses? Evaluating Retrieval Qualities Of Google Scholar, Pubmed, and 26 Other Resources. *Research Synthesis Methods, 11*(2), 181–217. https://doi.org/10.1002/jrsm.1378

Halvaiepour, Z., Yazdkhasti, F., Oreyzi, H., & Nosratabadi, M. (2020). Developing Cognitive Bias Modification Scenarios for Women With Sexual Interest Arousal Disorder and Comparing Effectiveness With Mindfulness Therapy. *Journal of Sex & Marital Therapy, 47*(2), 162–173. https://doi.org/10.1080/0092623x.2020.1842572

Harrer, M., Cuijpers, P., Furukawa, T.A., & Ebert, D.D. (2021). *Doing Meta-Analysis with R: A Hands-On Guide.* Chapman & Hall/CRC Press.

Hedges, L. V. (1981). Distribution Theory for Glass's Estimator of Effect Size and Related Estimators. *Journal of Educational Statistics, 6*(2), 107–28. https://doi.org/10.3102/10769986006002107

Hojjata Najafabadi, S., Vakilian, K., Ghaemmaghami, M., Zmaniia, M., & Beigi, M.

(2023). Investigating the Effect of Mindfulness Counselling on Sexual Functioning of Women With Premenstrual Syndrome. *Sexual & Reproductive Healthcare, 37*, Article e100886. https://doi.org/10.1016/j.srhc.2023.100886

Hosseini Nejad, S., Bokaie, M., & Ardekani, S. M. Y. (2023). Effectiveness of Sexual Health Counseling Based on Mindfulness Approach on Sexual Satisfaction in Women Suffering From Infertility: An RCT. *Iranian Journal of Reproductive Medicine, 21*(2), 147-158. https://doi.org/10.18502/ijrm.v21i2.12805

Howell, A. J., & Passmore, H.-A. (2018). Acceptance and Commitment Training (ACT) as a Positive Psychological Intervention: A Systematic Review and Initial Meta-Analysis Regarding ACT's Role in Well-Being Promotion Among University Students. *Journal of Happiness Studies, 20*(6), 1995–2010. https://doi.org/10.1007/s10902-018-0027-7

Jannini, E. A., McCabe, M. P., Salonia, A., Montorsi, F., & Sachs, B. D. (2010). Controversies in Sexual Medicine: Organic vs. Psychogenic? The Manichean Diagnosis in Sexual Medicine. *The Journal of Sexual Medicine, 7*(5), 1726–1733. https://doi.org/10.1111/j.1743-6109.2010.01824.x

Javadivala, Z., Allahverdipour, H., Kouzekanani, K., Khoei, E. M., Jafarabadi, M. A., & Mirghafourvand, M. (2018). A Randomized Trial of a Relationship-Enhancement Approach in Improving Marital Intimacy in Middle-Aged Iranian Couples. *Journal of Sex & Marital Therapy, 45*(3), 190–200. https://doi.org/10.1080/0092623x.2018.1501447

Kanter, G. S., Komesu, Y. M., Qaedan, F., Jeppson, P. C., Dunivan, G. C., Cichowski, S., & Rogers, R. G. (2016). Mindfulness-Based Stress Reduction as a Novel Treatment for Interstitial Cystitis/Bladder Pain Syndrome: A Randomized Controlled Trial. *International Urogynecology Journal, 27*(11), 1705–1711. https://doi.org/10.1007/s00192-016-3022-8

Kemerer, B., Zdaniuk, B., Higano, C. S., Bossio, J. A., Santos, R. C. B., Flannigan, R., & Brotto, L. A. (2023). A Randomized Comparison of Group Mindfulness and Group Cognitive Behavioral Therapy vs Control for Couples After Prostate Cancer With Sexual Dysfunction. *The Journal of Sexual Medicine, 20*(3), 346–366. https://doi.org/10.1093/jsxmed/qdac038

Keyes, C. L. M. (2005). Mental Illness and/or Mental Health? Investigating Axioms of the Complete State Model of Health. *Journal of Consulting and Clinical Psychology, 73*(3), 539–548. https://doi.org/10.1037/0022-006x.73.3.539

Keyes, C. L. M. (2007). Promoting and Protecting Mental Health as Flourishing: A Complementary Strategy for Improving National Mental Health. *American Psychologist, 62*(2), 95–108. https://doi.org/10.1037/0003-066X.62.2.95

Keyes, C. L. M., Wissing, M. P., Potgieter, J., Temane, M., Kruger, A., & Van Rooy, S. (2008). Evaluation of the Mental Health Continuum–Short Form (MHC–SF) in Setswana-Speaking South Africans. *Clinical Psychology & Psychotherapy, 15*(3), 181–192. https://doi.org/10.1002/cpp.572

Knapp, G. & Hartung, J. (2003). Improved Tests for a Random Effects Meta-Regression with a Single Covariate. *Statistics in Medicine, 22*(17), 2693–2710. https://doi.org/10.1002/sim.1482

Leavitt, C. E., Lefkowitz, E. S., & Waterman, E. A. (2019). The Role of Sexual Mindfulness in Sexual Wellbeing, Relational Wellbeing, and Self-Esteem. *Journal of Sex & Marital Therapy, 45*(6), 497–509. https://doi.org/10.1080/0092623x.2019.1572680

Lin, C., Potenza, M. N., Broström, A., Blycker, G. R., & Pakpour, A. H. (2019). Mindfulness-based Cognitive Therapy for Sexuality (MBCT-S) Improves Sexual Functioning and Intimacy Among Older Women with Epilepsy: A Multicenter Randomized Controlled Trial. *Seizure: European Journal of Epilepsy, 73*, 64–74. https://doi.org/10.1016/j.seizure.2019.10.010

Lomas, T., & Ivtzan, I. (2016). Second Wave Positive Psychology: Exploring the Positive–Negative Dialectics of Wellbeing. *Journal of Happiness Studies, 17*(4), 1753–1768. https://doi.org/10.1007/s10902-015-9668-y

López-López, J. A., Page, M. J., Lipsey, M. W., & Higgins, J. P. T. (2018). Dealing With Effect Size Multiplicity in Systematic Reviews and Meta-Analyses. *Research Synthesis Methods, 9*(3), 336–351. https://doi.org/10.1002/jrsm.1310

Lüdecke, D. (2019). esc: Effect Size Computation for Meta-Analysis (Version 0.5.1). *Zenodo*. https://doi.org/10.5281/zenodo.1249218

Marušić, M. F., Fidahić, M., Cepeha, C. M., Farcaș, L. G., Tseke, A., & Puljak, L. (2020). Methodological Tools and Sensitivity Analysis for Assessing Quality or Risk of Bias Used in Systematic Reviews Published in the High-Impact Anesthesiology Journals. *BMC Medical Research Methodology, 20*, Article e121. https://doi.org/10.1186/s12874-020-00966-4

McAuley, L., Pham, B., Tugwell, P., & Moher, D. (2000). Does the Inclusion of Grey Literature Influence Estimates of Intervention Effectiveness Reported in Meta-

Analyses? *The Lancet, 356*(9237), 1228–1231. https://doi.org/10.1016/s0140-6736(00)02786-0

McCabe, M. P., & Connaughton, C. (2017). Sexual Dysfunction and Relationship Stress: How Does This Association Vary for Men and Women? *Current Opinion in Psychology, 13*, 81–84. https://doi.org/10.1016/j.copsyc.2016.05.007

Mestre-Bach, G., Blycker, G. R., & Potenza, M. N. (2022). Behavioral Therapies for Treating Female Sexual Dysfunctions: A State-of-the-Art Review. *Journal of Clinical Medicine, 11*(10), Article e2794. https://doi.org/10.3390/jcm11102794

Mojtehedi, M., Salehi-Pourmehr, H., Ostadrahimi, A., Asnaashari, S., Esmaeilpour, K., & Farshbaf-Khalili, A. (2022). Effect of Aromatherapy With Essential oil of Lavandula Angustifolia Mill-citrus Bergamia and Mindfulness-Based Intervention on Sexual Function, Anxiety, and Depression in Postmenopausal Women: A Randomized Controlled Trial With Factorial Design. *Iranian Journal of Nursing and Midwifery Research, 27*(5), 392–405. https://doi.org/10.4103/ijnmr.ijnmr_129_21

Neff, K. D., Rude, S. S., & Kirkpatrick, K. L. (2007). An Examination of Self-Compassion in Relation to Positive Psychological Functioning and Personality Traits. *Journal of Research in Personality, 41(*4), 908–916. https://doi.org/10.1016/j.jrp.2006.08.002

Nimbi, F. M., Galizia, R., Rossi, R., Limoncin, E., Ciocca, G., Fontanesi, L., Jannini, E. A., Simonelli, C., & Tambelli, R. (2022). The Biopsychosocial Model and the Sex-Positive Approach: An Integrative Perspective for Sexology and General Health Care. *Sexuality Research and Social Policy*, *19*(3), 894–908. https://doi.org/10.1007/s13178-021-00647-x

Page, M. J., Moher, D., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., . . . McKenzie, J. E. (2021). PRISMA 2020 Explanation and Elaboration: Updated Guidance and Exemplars for Reporting Systematic Reviews. *BMJ, 372*(n160). https://doi.org/10.1136/bmj.n160

Posit Team. (2023). *RStudio Desktop IDE* (Version 2023.06.0-421) [Computer software]. PBC. https://posit.co/products/open-source/rstudio/

Rao, M. A., & Donaldson, S. I. (2015). Expanding Opportunities for Diversity in Positive Psychology: An Examination of Gender, Race, and Ethnicity. *Canadian Psychology, 56*(3), 271–282. https://doi.org/10.1037/cap0000036

Rashedi, S., Maasoumi, R., Vosoughi, N., & Haghani, S. (2021). The Effect of Mindfulness-

Based Cognitive-Behavioral Sex Therapy on Improving Sexual Desire Disorder, Sexual Distress, Sexual Self-Disclosure and Sexual Function in Women: A Randomized Controlled Clinical Trial. Journal of Sex & Marital Therapy, 48(5), 475–488. https://doi.org/10.1080/0092623x.2021.2008075

R Core Team (2023). *R: A Language and Environment for Statistical Computing* (Version 4.3.1) [Computer software]. R Foundation for Statistical Computing. https://www.R-project.org

Reade, M. C., Delaney, A., Bailey, M., & Angus, D. C. (2008). Bench-to-Bedside Review: Avoiding Pitfalls in Critical Care Meta-Analysis – Funnel Plots, Risk Estimates, Types of Heterogeneity, Baseline Risk and the Ecologic Fallacy. *Critical Care, 12*(4), Article e220. https://doi.org/10.1186/cc6941

Rojiani, R., Santoyo, J. F., Rahrig, H., Roth, H. D., & Britton, W. B. (2017). Women Benefit More Than Men in Response to College-Based Meditation Training. *Frontiers in Psychology, 8*, Article e551. https://doi.org/10.3389/fpsyg.2017.00551

Ruini, C., & Mortara, C. C. (2022). Writing Technique Across Psychotherapies—From Traditional Expressive Writing to New Positive Psychology Interventions: A Narrative Review. *Journal of Contemporary Psychotherapy, 52*(1), 23–34. https://doi.org/10.1007/s10879-021-09520-9

Rullo, J., Sood, R., Fokken, S. C., Sood, A., Frohmader, K. S., Croghan, I. T., Schroeder, D. R., & Faubion, S. S. (2021). Couples' Use of Online Stress Management and Resiliency Training For Sexual Health Concerns: A Randomized Controlled Trial. *Sexual Medicine, 9*(4), Article e100404. https://doi.org/10.1016/j.esxm.2021.100404

Saniei, S., Fahami, F., Samouei, R., & Tehrani, H. G. (2022). Investigation of the Effect of Mindfulness on Sexual Desire and Sexual Satisfaction in Primigravida Pregnant Women. *Journal of Education and Health Promotion, 11*, Article e61. https://doi.org/10.4103/jehp.jehp_176_21

Shapiro, S. L., Jazaieri, H., & De Sousa, S. (2016). Meditation and Positive Psychology. In C.R. Snyder, S. J. Lopez, L. M. Edwards, & S. C. Marque. *The Oxford Handbook of Positive Psychology* (3rd ed., pp. 862–877). Oxford Academic. https://doi.org/10.1093/oxfordhb/9780199396511.013.50

Schünemann, H., Brożek, J., Guyatt, G., & Oxman, A. (Reds.). (2013). *GRADE Handbook*. https://gdt.gradepro.org/app/handbook/handbook.html

Shi, Y., Cai, J., Wu, Z., Li, J., Xiong, G., Gan, X., & Wang, X. (2020). Effects of a Nurse-Led

Positive Psychology Intervention on Sexual Function, Depression and Subjective Well-being in Postoperative Patients With Early-Stage Cervical Cancer: A Randomized Controlled Trial. *International Journal of Nursing Studies, 111*, Article e103768. https://doi.org/10.1016/j.ijnurstu.2020.103768

Sin, N. L., & Lyubomirsky, S. (2009). Enhancing Well-Being and Alleviating Depressive Symptoms With Positive Psychology Interventions: A Practice-Friendly Meta-Analysis. *Journal of Clinical Psychology, 65*(5), 467–487. https://doi.org/10.1002/jclp.20593

Stephenson, K. R., & Kerth, J. (2017). Effects of Mindfulness-Based Therapies for Female Sexual Dysfunction: A Meta-Analytic Review. *Journal of Sex Research, 54*(7), 832–849. https://doi.org/10.1080/00224499.2017.1331199

Stephenson, K. R., & Meston, C. M. (2013). The Conditional Importance of Sex: Exploring the Association Between Sexual Well-Being and Life Satisfaction. *Journal of Sex & Marital Therapy, 41*(1), 25–38. https://doi.org/10.1080/0092623x.2013.811450

Sterne, J. A. C., Savović, J., Page, M. J., Elbers, R. G., Blencowe, N. S., Boutron, I., Cates, C. J., Cheng, H., Corbett, M., Eldridge, S., Emberson, J., Hernán, M. A., Hopewell, S., Hróbjartsson, A., Junqueira, D. R., Jüni, P., Kirkham, J. J., Lasserson, T. J., Li, T., … Higgins, J. P. T. (2019). ROB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ*, Article el4898. https://doi.org/10.1136/bmj.l4898

Thomas, H. N., Brotto, L. A., De Abril Cameron, F., Yabes, J. G., & Thurston, R. C. (2023). A Virtual, Group-Based Mindfulness Intervention for Midlife and Older Women With Low Libido Lowers Sexual Distress in a Randomized Controlled Pilot Study. *The Journal of Sexual Medicine, 20*(8), 1060–1068. https://doi.org/10.1093/jsxmed/qdad081

Thompson, R. B., Peura, C., & Gayton, W. F. (2014). Gender Differences in the Person-Activity fit for Positive Psychology Interventions. *The Journal of Positive Psychology, 10*(2), 179–183. https://doi.org/10.1080/17439760.2014.927908

Van Agteren, J., Iasiello, M., Lo, L., Bartholomaeus, J., Kopsaftis, Z., Carey, M. E., & Kyrios, M. (2021). A Systematic Review and Meta-Analysis of Psychological Interventions to Improve Mental Wellbeing. *Nature Human Behaviour, 5*(5), 631–652. https://doi.org/10.1038/s41562-021-01093-w

Van Driel, C., De Bock, G. H., Schroevers, M., & Mourits, M. (2018). Mindfulness-Based Stress Reduction for Menopausal Symptoms After Risk-Reducing Salpingo-Oophorectomy (PURSUE study): A Randomised Controlled Trial. *BJOG: An*

International Journal Of Obstetrics And Gynaecology, 126(3), 402–411. https://doi.org/10.1111/1471-0528.15471

Velten, J., Margraf, J., Chivers, M. L., & Brotto, L. A. (2017). Effects of a Mindfulness Task on Women's Sexual Response. *Journal of Sex Research, 55*(6), 747–757. https://doi.org/10.1080/00224499.2017.1408768

Veritas Health Innovation. (2023). *Covidence Systematic Review Software* [Computer software]. www.covidence.org

Viechtbauer, W. (2005). Bias and Efficiency of Meta-Analytic Variance Estimators in the Random-Effects Model. *Journal of Educational and Behavioral Statistics*, 30(3), 261–293. https://doi.org/10.3102/1076998603000326

Viechtbauer, W. (2010). Conducting Meta-Analyses in R with the Metafor Package. *Journal of Statistical Software, 36*(3), 1-48. https://doi.org/10.18637/jss.v036.i03

Weitkamp, K., Hänisch, I., & Heesch, S. (2020). A Controlled Pilot Study to Test the Online Intervention Self:Cervix Focusing on Cervical Pain, Numbness, Sexual Pleasure and Well-Being. *Psychology and Sexuality, 12*(3), 279–288. https://doi.org/10.1080/19419899.2020.1713874

Westerhof, G. J., Bohlmeijer, E. T., & Webster, J. D. (2010). Reminiscence and Mental Health: A Review of Recent Progress in Theory, Research and Interventions. *Ageing & Society, 30*(4), 697–721. https://doi.org/10.1017/s0144686x09990328

Wickham, H., Averick, M., Bryan, J., Chang, W., McGowan, L. D., François, R., Grolemund, G., Hayes, A., Henry, L., Hester, J., Kuhn, M., Pedersen, T. L., Miller, E., Bache, S. M., Müller, K., Ooms, J., Robinson, D., Seidel, D. P., Spinu, V., … Yutani, H. (2019). Welcome to the Tidyverse. *Journal of Open Source Software, 4*(43), Article e1686. https://doi.org/10.21105/joss.01686

Wickham, H. (2016). *ggplot2: Elegant Graphics for Data Analysis*. Springer. https://doi.org/10.1007/978-3-319-24277-4

Wickham, H., & Bryan, J. (2023). *readxl: Read Excel Files* (R package version 1.4.3) [Computer software]. https://CRAN.R-project.org/package=readxl

World Health Organization. (2002). *Defining Sexual Health: Report of a Technical Consultation on Sexual Health 28-31 January 2002, Geneva*. https://www.cesas.lu/perch/resources/whodefiningsexualhealth.pdf

Appendices

Appendix A: Glossary

95%CI = 95%-Confidence Interval

ACT = Acceptance and Commitment Therapy

ATWGS = Attitude Towards Women's Genitalia Scale

BAI = Beck Anxiety Inventory

BDI-II = Beck Depression Inventory-II

BIBCQ = Body Image after Breast Cancer Questionnaire

BIS = Body Image Scale

BSI-18 = Brief Symptom Inventory–18

CBM = Cognitive Bias Modification

CBT = Cognitive Behavioural Therapy

CD-RISC-2 = Connor-Davidson Resilience Scale-2

Cochrane ROB2 Tool = Cochrane Risk Of Bias 2 Tool

CSFQ-F = Changes in Sexual Function Questionnaire for Females

CSFQ-M = Changes in Sexual Function Questionnaire for Males

DAS = Dyadic Adjustment Scale

DAS-7 = Dyadic Adjustment Scale-7

DASA = Detailed Assessment of Sexual Arousal

DSM-V = Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition

FACT-G = Functional Assessment of Cancer Therapy – General

FFMQ = Five Facet Mindfulness Questionnaire

FFMQ-SF = Five Facet Mindfulness Questionnaire-Short Form

FOD = Female Orgasmic Disorder

FSDS = Female Sexual Distress Scale

FSDS-R = Female Sexual Distress Scale-Revised

FSFI = Female Sexual Function Index

GAD-7 = Generalised Anxiety Disorder-7

GPPPD = Genito-Pelvic Pain/Penetration Disorder

GQ-6 = Gratitude Questionnaire-6

GRA = Global Response Assessment

HADS = Hospital Anxiety and Depression Scale

HK = Knapp-Hartung adjustments

ICTRP = International Clinical Trials Registry Platform

IIEF = International Index of Erectile Function

ISS = Index of Sexual Satisfaction

MBCT = Mindfulness-Based Cognitive Therapy

MENQOL = Menopause-specific Quality of Life Questionnaire

MSQ = Multidimensional Sexuality Questionnaire

OSPI = O'Leary–Sant Symptom and Problem Index

PAIR = Personal Assessment of Intimacy in Relationships

PI = Prediction Interval

PPI = Positive Psychological Intervention

PRISMA = Prevention and Recovery Information System for Monitoring and Analysis

PROSPERO = The International Prospective Register of Systematic Reviews

PRQC = Perceived Relationship Quality Components Inventory

PSEQ = Pain Self-Efficacy Questionnaire

PSS-4 = Perceived Stress Scale-4

RDAS = Revised Dyadic Adjustment Scale

REEC = Relationship Enhancement Education and Counselling

SAGASF-F= Self-Assessment of Genital Anatomy and Sexual Function

SBAQ = Sexual Behaviors Assessment Questionnaire

SCL-90-R = Symptom Checklist-90 Revised

SDI-2 = Sexual Desire Inventory-2

SF-12 = 12-Item Short Form Health Survey

SFQ = Sexual Function Questionnaire

SHS = Subjective Happiness Scale

SIAD = Sexual Interest Arousal Disorder

SIDI = Sexual Interest and Desire Inventory

SIDI-F = Sexual Interest and Desire Inventory–Female

SQOL = Sexual Quality of Life

SSE = Sexual Self-Efficacy

SWLS = Satisfaction With Life Scale

TAU = Treatment As Usual

VAS = Visual Analogue Scale

WHOQOL-BREF = Abbreviated Version of WHO Quality of Life