

The Relationship Between Emotion Regulation and Sexual Function and Satisfaction: A Scoping Review

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ABSTRACT

Introduction: Sexual problems are characterized by difficulties in the ability to respond sexually or to obtain sexual pleasure. Their etiology is assumed to be multifactorial, demanding a biopsychosocial treatment approach. Positive sexual experiences involve the dynamic interplay between cognitive, emotional, and motivational factors. Difficulties in emotion identification or impairment in emotion regulation may thus play a pivotal role in the development and maintenance of sexual problems.

Objectives: To conduct a scoping review of the literature on the effects of emotion regulation on sexual function and satisfaction.

Methods: We conducted a scoping review using Cinahl, Lilacs, Scielo, Scopus, PsycInfo and Pubmed electronic databases using search terms related to emotion regulation and sexual function and satisfaction.

Results: 27 articles met the inclusion criteria and were further analyzed. Overall, emotion regulation difficulties were associated with poorer sexual health outcomes, difficulties in the sexual response cycle and overall lower sexual satisfaction. Laboratory studies and intervention trials found positive effects of promoting emotion regulation change on sexual function and satisfaction.

Conclusions: Despite the methodological diversity of studies, it can be concluded from this review that difficulties in emotion regulation are related to sexual difficulties and sexual dissatisfaction. Future research should consider emotion regulation-focused interventions to mitigate sexual health problems.. **Fischer VJ, Andersson G, Billieux J, et al. The Relationship Between Emotion Regulation and Sexual Function and Satisfaction: A Scoping Review. Sex Med Rev 2021;XX:XXX–XXX.**

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Key Words: Emotion regulation; Sexual health; Sexual satisfaction; Sexual disorders; Systematic review; Scoping review

INTRODUCTION

Sexual health is “a central aspect of overall health and encompasses physical, emotional, mental and social well-being in relation to sexuality, and not only the absence of disease, dysfunction or infirmity”.¹ Sexual health “requires a positive approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences. Sexual health cannot be

understood without taking into consideration the definition of sexuality, which underlies important elements of sexual health, such as the experience and expression of thoughts, fantasies, desires, beliefs, attitudes, values, behaviors and practices”.²

In contrast to sexual health, sexual disorders are characterized by difficulties in the ability to respond sexually or to obtain sexual pleasure.³ Their etiology is assumed to be multifactorial, encompassing physiological, affective, interpersonal, and psychological, context-dependent-factors.⁴ Epidemiological data suggests that approx. About 40-45% of adult women and 20-30% of adult men in the general population fulfil the criteria for at least one sexual dysfunction during their lives.⁵

The recommendations for a high standard of sexological care and research recognize that sexual health should be assessed using a biopsychosocial approach, considering not only biological aspects but also psychological factors, partner-related factors, the social context, environmental factors and life stressors (daily hassles, critical life events). These factors are assumed to play a

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crucial role in rendering individuals susceptible to developing sexual difficulties, in triggering the onset of a sexual problem, and in maintaining sexual dysfunction in the long term.⁶

A shared element of these factors is emotion regulation (ER). ER refers to the way in which emotions are generated, experienced, and modulated. Such processes include emotional awareness (attention, differentiation, and labeling of emotions), their expression (suppression versus expression of emotions), and their experience (accessing and reflecting on one's emotions and their consequences).⁷

Different emotion regulation models have been proposed.^{8–10} Among the most influential model is Gross' extended process model of emotion regulation.⁸ This model defines the process through which individuals regulate their emotions at different points in the process of emotion generation (eg, situation selection, situation modification, attentional deployment, cognitive change, and response modulation). In this model, the type and timing of the emotion regulation strategy used by an individual impact what emotion one has and how it is expressed.⁸ This model has several elements in common with other ER models which place special importance on the strategies used by individuals to regulate the process via which emotions are generated and enacted in behavior.^{11,12} Considering sexual health, it is plausible that the ability to use ER strategies that are situation and context adequate (i.e. adaptive in terms of downregulating negative emotions), are beneficial for both sexual function and satisfaction. For example, unsatisfactory sexual encounters may be better dealt with reappraisal of the negative emotions and not with avoidance of future situations.

Functional components of efficient ER, includes: (i) awareness and understanding of emotions; (ii) acceptance of emotions; (iii) the ability to control impulsive behaviors and to behave in accordance with desired goals when experiencing both negative and positive emotions; and (iv) the ability to use situationally appropriate ER strategies to achieve personal goals and meet situational demands.^{9,13} ER strategies are not intrinsically adaptive or maladaptive. Instead, this depends on whether they enable social functioning, and what is appropriate in a given environment and context.^{9,14} Consequently, emotion dysregulation corresponds to the difficulty or inability to process emotions adequately, which has been associated with unhealthy coping strategies,¹⁵ and is often regarded as a transdiagnostic factor for psychopathology.¹⁶

ER can be assessed in different ways. The majority of studies use self-report measures, which offer important information on emotion regulation and dysregulation. Nevertheless, self-report measures are subject to bias and may reflect people's beliefs about their ER strategies (sensa meta-cognitive beliefs) rather than their actual ER behavior. Useful and complementary assessment methods are, therefore, experimental paradigms to assess behavioral, psychophysiological and neurological indices of ER.¹⁷

Emotions, as well as sexual problems, normally arise in the context of an interpersonal encounter and are often shared and

regulated within the relationship experience.¹⁸ Emotions affect sexual behavior either by strengthening or weakening feelings of sexual arousal and sexual desire.¹⁹ For instance, experiencing positive emotions and feelings such as high satisfaction with current sexual relationships and affection is associated with strong sexual desire,²⁰ while shame (eg, related to low performance or self-perceived attractiveness), fear (of genital pain), performance anxiety, or disgust (associated with signals of contamination threat) may hinder sexual arousal and desire.²¹

Sexual problems are commonly observed in complex relational environments, with relationship processes being involved not only in the generation and experience of sexual emotions, but also in their regulation.²² Sexual experience can be understood as an ER strategy that involves the dynamic interplay between cognitive, affective, and motivational responses. It is likely that partner variables, relationship processes, and the socio-relational context interact with these individual responses and eventually shape how sexual emotions are generated and regulated.²³ As a result, the dysregulation of sexual emotions most likely constitutes a vulnerability factor for developing sexual problems.^{24,25}

There are several studies on the association between ER and certain aspects of sexuality such as sexual frequency and partner selection,²⁶ sexual compulsivity and/or hypersexuality and risk behaviors.^{27–29} In contrast, the relationship between ER and sexual function and satisfaction has received much less attention in research.

The present scoping review³⁰ addresses this gap in research. We chose the format of a scoping review for this review as this approach offers the possibility to provide a broad synthesis of the current state of the art rather than a critique of methodological issues or strength of the evidence. A more quantitative systematic review attempting to assess the quality of the available evidence may be premature at this time, given the heterogeneity in research designs and reporting standards in this field.³⁰

In this review we investigated the relationship between ER and sexual function and satisfaction. Our aim was to identify and explore studies published to date, which have investigated the associations between ER and sexual health. The current review summarizes the current state-of-the-art of the literature regarding the associations between ER, and sexual functioning, disorders and satisfaction. We also provide an account of the methodology of ER research with respect to sexual health.

METHODS

Inclusion and Exclusion Criteria

To be included in the scoping review, studies were required to fulfill the following criteria: (i) original empirical study; (ii) psychological and/or physiological assessment of emotion regulation; (iii) psychological or physiological assessment of sexual function and/or sexual satisfaction; (iv) participants aged 18 years or older, and (v)

study published in English, Spanish, French, German or Portuguese (ie, the languages known by at least one of the authors).

The papers matching the inclusion criteria based on their title and abstract were then screened based on the following exclusion criteria: (i) studies not relating emotion regulation to sexual function or satisfaction and (ii) studies aiming at developing assessment instruments.

Databases Examined and Search Strategy

Studies were identified through searches in Cinahl, Lilacs, Scielo, Scopus, PsycInfo and Pubmed electronic databases. All searches were run in April 2021. An intersection of the search terms of the following groups was performed in all databases, group 1: emotion or emotion regulation and group 2: sexual function terms. No publication date limit was used. The search terms applied were: (“emotion regulation” (OR) “emotion”) (AND) (“sexuality”) (OR) (“sexual health”) (OR) (“sexual disorder”) (OR) (“sexual dysfunction”) (OR) “sexual problem” (OR) “sexual satisfaction”).

Data Collection Process and Data Items

Articles were screened by title and abstract applying the eligibility criteria for inclusion. After excluding duplicate articles, exclusion criteria were applied reading the full-text of the remaining articles. Data extracted included the following: (i) first author and year of publication, (ii) study participant characteristics (sample size, mean age, gender, groups, clinical status), (iii) study design, (iv) methods of assessment of emotional state or ER, (v) clinical status, (vi) method of assessment of sexual function or sexual satisfaction, (vii) statistical analyses performed, and (viii) results.

See [Figure 1](#) for the flow-chart summarizing the article inclusion process.

RESULTS

Twenty-seven articles matched the inclusion criteria and were included in the review. In terms of research design, 21 articles (77.7%) were observational, while six studies used an experimental and/or intervention design. Regarding the sample characteristics, nine studies were conducted with non-clinical participants, seven with participants with mental disorders, four with non-sexual clinical conditions, four with sexual disorders and three with victims of violence. [Table 1](#) summarizes the information from the included articles.

Observational Studies

Non-Clinical Samples. Nine studies addressed the role of ER in non-clinical samples. With regards to effects on sexual distress in women, ER was found to mediate the relationship between anxiety sensitivity and psychological distress, with the mediation

accounting for a large amount of the variance in psychological distress (51.3%), and anxiety sensitivity explaining a smaller proportion of the variance in ER (30.4%).³¹ Similarly, ER difficulties were associated with increased sexual dissatisfaction in women; however, such difficulties did not affect intimacy and affection expression.³² With regards to effects on sexual desire and arousal in men, a range of effects emerged. Anxiety sensitivity predicted sexual desire and was related to higher psychological distress.³³

Both in couples and single individuals, ER mediated the association between positive sexual outcomes and dispositional mindfulness - a quality of non-judgmental and present-focused awareness.^{34,35} Also, both men and women tended to accurately perceive their partners' sexual satisfaction, with emotion recognition being particularly important in cases where sexual communication was poor.³⁶ Difficulties in identifying bodily sensations and labelling the emotional experience correlated with sexual difficulties in the sexual response cycle of both men and women (arousal, lubrication, orgasm, pain, erection and ejaculation).³⁷

In summary, in non-clinical samples, difficulties in regulating emotions are associated with worse sexual health outcomes. These results hold for men and women, and across relationship status.

Sexual Disorders. Three studies examined the role of ER for sexual health in samples with various sexual disorders. One of the cross-sectional studies was conducted with a sample of women with different marital status³⁸ while the other included heterosexual couples.³⁹

Vasconcellos et al.³⁸ assessed how self-compassion related to difficulties in ER and with self-reported sexual dysfunction. Women with self-reported sexual dysfunction, especially women with self-reported sexual pain showed lower self-compassion and more difficulties in ER than women without sexual problems. Dubé et al.³⁹ assessed ER strategies (emotional suppression and reappraisal) in heterosexual couples in which the women were diagnosed with female sexual interest and/or arousal disorder. In women greater emotional suppression was associated with greater depression and anxiety, and lower relationship satisfaction. In contrast, emotional reappraisal was associated with lower depression and anxiety, and fewer dyadic conflicts with their partners. Similarly, in men reporting greater emotional suppression, this was associated with increased depression, lower relationship satisfaction, and lower levels of sexual desire. In contrast, higher self-reports of emotional reappraisal were related to lower depression and anxiety, higher relationship satisfaction, fewer dyadic conflicts, and higher levels of sexual desire. The female partners of these men reported higher relationship satisfaction and fewer dyadic conflicts.³⁹

In conclusion, for both genders, difficulties in ER and the predominant use of emotion suppression negatively impacted on sexual health.

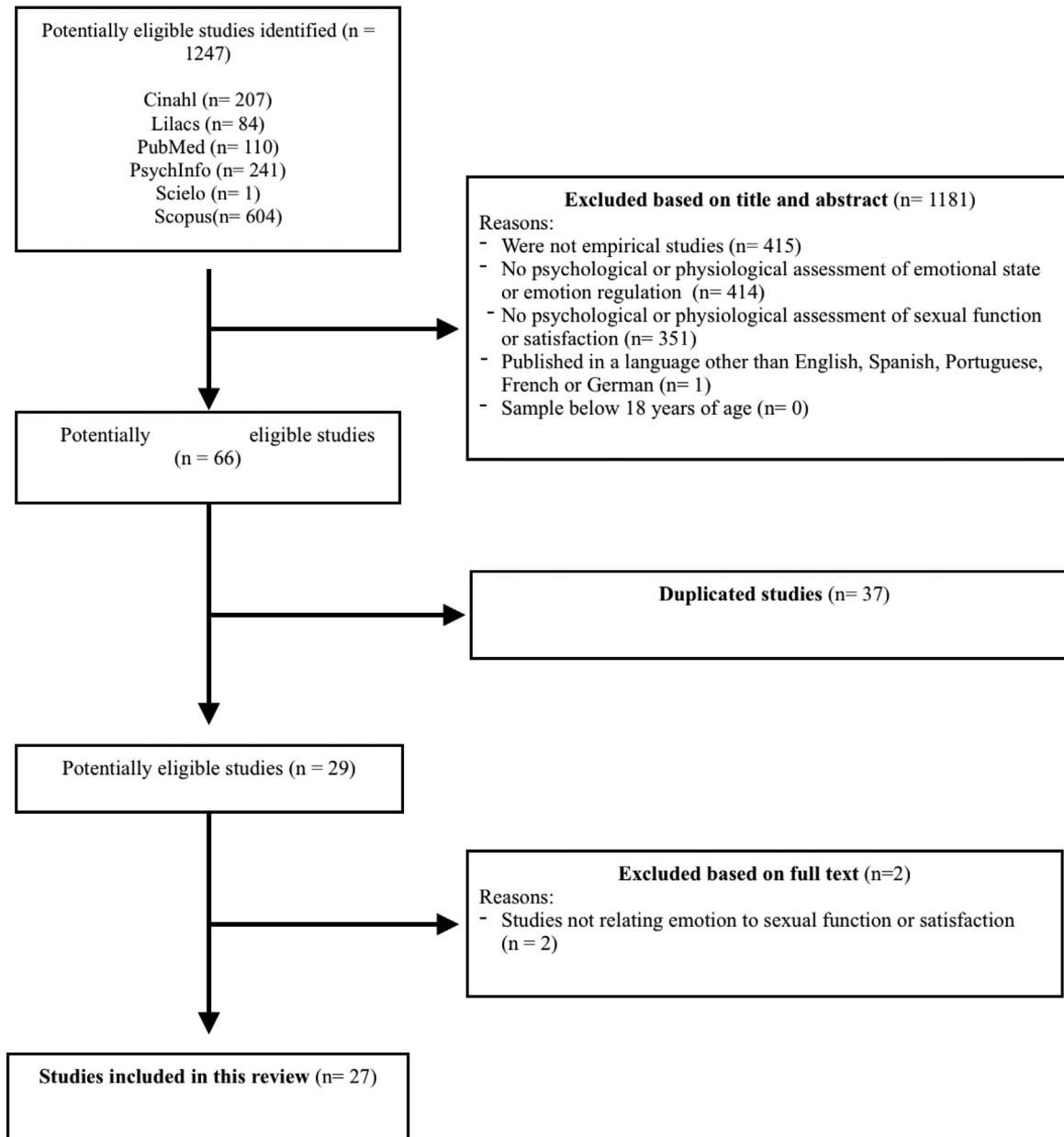


Figure 1. Flow chart.

Non-Sexual Clinical Conditions. Four studies analyzed the role of ER for sexual health in groups with a range of non-sexual clinical conditions (i.e., no sexual disorders). Two studies assessed women with vulvodynia, two studies with oncological samples.

With regards to vulvovaginal conditions, Connor et al.⁴⁰ found that, ruminative thinking predicted lower sexual satisfaction. In a similar vein, another study on persons with vestibulodynia⁴¹ showed that ambivalence over emotion expression was associated with reduced sexual satisfaction ($r = -0.21, P < .01$), sexual function ($r = -0.26, P < .01$), dyadic adjustment ($r = -0.29, P < .01$), and with higher pain ($r = 0.20, P < .01$), and depression scores ($r = 0.52, P < .01$).

With respect to studies including oncological patients or husbands of survivors, ER and communication difficulties co-occurred with sexual health difficulties. In a sample of prostate cancer participants, Wooten et al.⁴² found that emotion-focused coping and threat appraisal mediated the relationship between sexual difficulties and mood disturbance. Emotion-focused coping to handle sexual distress resulted in poor psychological adjustment. Another study focusing on husbands of breast cancer survivors, showed that lower caregiving burden, higher marital satisfaction, and lower harm and/or threat appraisals were associated with better sexual quality of life. Importantly, ambivalence over emotional expression moderated the association between protective buffering and sexual quality of life.⁴³

In summary, despite the range and specificities of the conditions included in these studies, overall negative emotions during sexual interactions, emotion-based rumination, emotion-focused coping and emotion dysregulation had a negative impact on sexual health and satisfaction. In contrast, emotion expression was positively related to sexual function and satisfaction both in oncological and in vulvovaginal patients.

Mental Conditions. Out of the 7 studies with participants with mental conditions, 2 were conducted with participants with anxiety or depressive disorders, 2 with post-traumatic stress disorder, 2 with a diagnosis of schizophrenia, and 1 with participants with eating disorders. Regarding medication-induced sexual dysfunction, and in accordance with the literature on side effects of selective serotonin reuptake inhibitors, there was an association between SSRI-induced sexual dysfunction and the blunting of emotions.⁴⁴ In another study including anxious and depressive participants, a trans-diagnostic ER intervention showed improvements in quality of life, anxiety and depression symptomatology as well as improvements in sexual functioning.⁴⁵ Opposed to these results are findings from a study with individuals presenting with comorbid post-traumatic stress disorder and tobacco use disorders, in which emotion dysregulation was not related to sexual function but negatively associated with sexual satisfaction. Emotional dysregulation independently explained sexual dissatisfaction even when controlling for anxiety sensitivity, negative affectivity, posttraumatic stress symptom severity, trauma type and daily smoking rate.⁴⁶

In patients with a diagnosis of schizophrenia, Westheide et al.⁴⁷ assessed sexual impairment and emotion regulation in patients treated with quetiapine and risperidone. Participants on quetiapine reported less severe sexual impairment and better emotion regulation. Similarly, another study found that individual sexual activity and desire was associated with better emotional reactivity, cognitive functioning, motivation, psychomotricity and sensory perception.⁴⁸

Regarding eating disorders, as compared with healthy controls, both clinical subgroups (anorexia nervosa and bulimia nervosa) reported higher scores in symptom severity, impulsiveness and emotion dysregulation. Comparing both clinical subgroups, and compared with the restricting subgroup, the binge-purging subgroup reported higher levels of emotion dysregulation than the restricting subgroup. When compared to the control group, eating disordered patients reported lower functioning in each Female Sexual Function Index subscale, with substantially lower levels of sexual functioning in the restricting as compared with the binge-purging group.⁴⁹

In summary, ER difficulties are associated with impaired sexual health in groups with a range of mental disorders, either in terms of sexual function or sexual satisfaction.

Victims of Violence. Three studies addressed ER in victims of violence (with a majority of women in these samples). Two

studies included victims of childhood sexual abuse, while one study was conducted with spousal victims of intimate partner violence. With reference to childhood sexual abuse, victims may differ in their self-reported responses regarding the violence experienced, and their self-perception and sexuality in adulthood.⁵⁰ Survivors of childhood sexual abuse involving touching only were at greater risk of reporting more negative sexual self-concept such as experiencing negative feelings during sex than were non-abused participants. Depending on the preferred ER strategies, the impact on psychological and sexual well-being also varies. Emotion-oriented coping strategies, ie, strategies aimed at managing negative emotional responses, have been shown to mediate outcomes related to a negative sexual self-concept (experience of negative feelings during sex.) Low levels of optimism, ie, the way individuals think and feel about their future,⁵¹ mediated outcomes related to both, more negative sexual self-concept and high-risk sexual behaviors. Low levels of optimism may lead to a more negative sexual self-concept and greater engagement in risky sexual behaviors.⁵² Sexual satisfaction is positively correlated with emotion regulation abilities.⁵¹

Finally, spousal victims of intimate partner violence showed more ER difficulties and sexual dissatisfaction than non-victims.⁵³

In conclusion, difficulties in ER were associated with impaired sexual health and lower satisfaction in victims of violence, with the degree of difficulties in psychological adaptation and with sexual health depending on the ER strategies used.

Experimental Studies. Six of the included studies used an experimental design. Four of these were laboratory experimental studies,^{54–57} while two were group intervention experiments.^{45,58}

Winters et al.⁵⁴ conducted an experiment investigating factors affecting the ability to regulate sexual arousal (emotion reappraisal) while watching erotic and humorous videoclips. Sexual excitation, inhibition, and desire correlated with sexual arousal regulation success. Increased sexual excitation and desire were associated with poorer regulatory performance, whereas a propensity for sexual inhibition due to fear of performance consequences was related to regulatory success. Another study investigated the regulation of sexual arousal by means of attentional focus in healthy, sexually functional men and women. The findings showed an attenuation of sexual feelings by attentional focus, with stronger sexual feelings under the hot focus (emotion information) condition than under the cool focus (cognitive) condition.

Sarin et al.⁵⁵ compared 3 groups (hypoactive sexual disorder, erectile dysfunction, healthy controls) on genital and self-reported arousal after watching a 15 minute film clip with neutral and erotic content. The healthy control group showed higher genital arousal than both clinical groups. Moreover, erectile dysfunction and hypoactive sexual disorder participants showed

lower agreement between self-reported arousal and genital arousal compared with healthy control participants. The 2 clinical groups also differed from healthy control group participants in terms of lower sexual excitation and sexual attitudes, and higher body image self-consciousness and alexithymia.

Van Overveld and Borg⁵⁶ examined the effects of a brief ER training designed to enhance arousal levels during the presentation of sexual stimuli. Participants were trained in the up-regulation of affect using either a sexual arousal film (ie, female-friendly erotic movie) or a threat arousal film clip (ie, horror movie), while control groups viewed the movie-clips without training instructions. Mood up-regulation enhanced arousal, suggesting that an ER training (increasing positive affect) may help with the management of affect-related sexual disorders.

With the aim to up-regulate sexual arousal and/or down-regulate disgust while watching pornography, a study⁵⁷ attempted to experimentally enhance sexual responses using instructions. As a result, up-regulation successfully enhanced feelings of sexual arousal, but this increase was not paralleled by reductions in feelings of disgust. Similarly, instructions to down-regulate successfully decreased disgust; however, this decrease was not paralleled by increases in sexual arousal.

Studies investigating the effects of multiple treatment sessions used a variety of intervention approaches and designs. A randomized intervention trial was conducted to enhance quality of life and sexual functioning in individuals with bipolar depressive disorder or anxiety disorder.⁴⁵ The psychological intervention was based on the Unified Protocol (UP), a transdiagnostic treatment approach targeting symptoms associated with a range of emotional disorders.⁵⁹ The UP was initially developed in response to high levels of comorbidity and the phenotypic overlap between emotional disorders while targeting the personality trait of neuroticism, ie, the tendency to experience frequent and intense negative affect, coupled with a perception of inadequate coping.^{59,60} The UP's main aims are to promote acceptance and a willingness attitude toward the experience of strong emotions to counter the processes that cause and maintain emotional disorders.^{59,60} Both intervention groups (UP group intervention + pharmacological treatment, and pharmacological treatment only group) showed significant improvements in quality of life, anxiety and depression. There were also improvements in sexual functioning with larger effects in the non-depressed group ($d = 2.62$) than in the depressed group ($d = 1.04$). Classen et al.⁵⁸ conducted a non-controlled trial to investigate the effects of a complex trauma intervention, consisting of an 8-week program using a multimodal treatment approach (inter-personal, psychodynamic, psycho-educational, cognitive-behavioral, creative arts, and somatically oriented groups) in a group of women with complex trauma. They found significant changes in posttraumatic stress disorder symptoms, dissociation, ER, interpersonal problems, sexual problems, alexithymia, and posttraumatic growth.⁵³

In summary, the research on ER using experimental designs, applied to sexual health suggests that ER interventions, both using single experimental treatments as well as multiple session designs (8 and 14 weeks) resulted in positive outcomes, in participants with mental and sexual disorders. Participants with better use of ER strategies, and better sexual and mental health, showed better sexual response identification and more adaptive behaviors towards sexual function and satisfaction.

SUMMARY OF FINDINGS AND DISCUSSION

The present scoping review aimed at providing a better understanding of the relationship between ER and sexual function and satisfaction, and at identifying the mechanisms underlying such an association. The articles included in this review cover a heterogeneous spectrum of research designs and participants, including both clinical and non-clinical samples.

Overall, and independent of the clinical status of the samples, difficulties in ER were related to negative outcomes, both regarding functionality and satisfaction. Emotion dysregulation was associated with poorer sexual health outcomes both with respect to function²⁸ and sexual satisfaction.⁴⁶

In this context, attention must be paid to the question of the direction of causality as it is likely that ER may causally contribute to sexual function and satisfaction, but the reverse may also be true. ER difficulties may be related to other variables contributing to sexual problems. For instance, emotion dysregulation can negatively affect the interpersonal connection with partners,^{61,62} but this also applies to depression (affecting interpersonal relationships).⁶³ In addition, and as can be seen from the variety of populations included in the reviewed studies (see the column diagnostic and/or symptomatology in the table), ER and emotion dysregulation do not exist in isolation and can be associated with a diversity of other factors (eg, health, relationship, communication). Importantly, and despite the heterogeneity of populations and variables investigated in previous research, a consistent pattern of poor ER associated with poorer sexual outcomes seems to emerge.

Among the articles that applied a mediation analysis, ER was found to mediate the relationship between dispositional mindfulness, and sexual health outcomes,³⁵ anxiety sensitivity, and psychological distress.³¹

Partners' emotion recognition abilities and negative emotions manifestations were important for dyadic adjustment, relational uncertainty and communication problems. This was found in patients with a diverse range of conditions as well as in non-clinical samples.^{36, 41, 42} These results are in line with the literature, suggesting that relational elements in addition to individual processes have to be taken into account when working with individuals with sexual problems.²²

Regarding mental health comorbidities, previous results from intervention studies have shown improvements in quality of life,

Table 1. Summary of included articles ordered by year of publication.

Authors and Year of Publication	Sample	Study Design	Diagnostic/Symptomatology	Emotion or Emotion Regulation Assessment	Sexual Health Assessment	Statistics	Main Results
Opbroek et al., 2002	15 men	Cross-sectional	Major depression, sexual dysfunction	LEIS - Laukes Emotional Intensity Scale, HAMD - Hamilton Depression Rating Scale	ASEX - Arizona Sexual Experiences Scale	ANOVA	80% of patients with SSRI-induced sexual dysfunction also describe clinically significant blunting of several emotions. Emotional blunting may be an under-appreciated side-effect of SSRIs that may contribute to treatment non-compliance and/or reduced quality of life.
Wootten et al., 2007	167 men (mean age = 70.90, SD = 7.18) who had undergone treatment for localized prostate cancer. 63 participants had undergone external beam radiotherapy (EBRT), 55 radical prostatectomy (RP), 27 EBRT plus hormone therapy (EBRT/HT),	Cross-sectional	Prostate cancer	POMS - Profile of Mood States, CISS - Coping Inventory for Stressful situation	UCLA-PCI - Los Angeles Prostate Cancer Index, DAS - Dyadic Adjustment Scale	Multiple regression analyses, hierarchical regression analysis	The majority of patients reported relatively positive adjustment in most domains except for sexual functioning. For those who reported ongoing psychological difficulty mood disturbance was associated with sexual bother, dyadic adjustment, threat appraisal, self-efficacy appraisal and emotion-focused coping. Emotion-focused coping and threat appraisal mediated the relationship between sexual bother and mood disturbance. Emotion-focused coping moderated the influence of dyadic adjustment on mood disturbance.
Westheide et al., 2008	102 patients divided in 2 groups. Group under Quetiapine (54% men, 46% woman, mean age = 37.3, SD = 13.3). Group under Risperidone (70% men, 30% women, mean age = 34.1, SD = 12.8)	Nonrandomized open label observational	Schizophrenia	SWN – Subjective well-being under neuroleptic treatment scale, PANSS – Positive and Negative Symptom Scale	Essener Fragebogen zur Sexualität	Pearson correlation, ANOVA, Wilcoxon test, Spearman rho	After 4 weeks, patients treated with quetiapine reported less severe sexual impairment, as well as lower PANSS negative and general score compared with patients treated with risperidone. Additionally, emotional regulation as measured with the SWN was higher in patients treated with quetiapine. In the group of patients treated risperidone, sexual impairment was significantly associated with the SWN subscale emotional regulation.
Winters et al., 2009	49 men (mean age = 27.7, SD = 10.1)	Experimental	Non-clinical	Self-report Amusement	Self-report Sexual Arousal, SIS/SES - Sexual Inhibition Scale/Sexual Excitation Scale, SDI-2 - Sexual Desire Inventory 2, DSFI-SE - Derogatis Sexual Functioning Inventory (Sexual experiences subtest), SCS - Sexual Compulsivity Scale, PPG - Penile Plethysmography	T-tests, ANOVA, Pearson Correlations coefficients	Participants, on average, were somewhat able to regulate their physiological and cognitive sexual arousal, although there was a wide range of regulation success. Whereas some men were very adept at regulating their sexual arousal, others became more sexually aroused while trying to regulate. Age, sexual experience, and sexual compulsivity were unrelated to sexual arousal regulation. Conversely, sexual excitation, inhibition, and desire correlated with sexual arousal regulation success. Increased sexual excitation and desire were associated with poorer regulatory performance, whereas a propensity for sexual inhibition due to fear of performance consequences was related to regulatory success
Rellini et al., 2010	43 trauma-exposed cigarette smokers: 17 women (mean age = 20.2, SD = 10.87)	Cross-sectional	PTSD and tobacco use disorder	SCID-I/NP -Structured Clinical Interview for DSM-IV Axis I Diagnoses/Nonpatient Version, PDS - Posttraumatic Stress Diagnostic Scale, DERS - Difficulties in Emotion Regulation Scale, ASI - Anxiety Sensitivity Index, PANAS - Positive and Negative Affect Schedule	CRISS - Golombok Rust Sexual Functions Scale	Hierarchical linear regression	When controlling for negative affectivity, type of trauma (sexual vs. nonsexual), daily smoking rate, posttraumatic stress symptoms, and anxiety sensitivity, emotion dysregulation provided an independent and unique contribution to sexual dissatisfaction but not to sexual function.
Lacelle et al., 2012	280 women victims of CSA	Cross-sectional	Childhood Sexual Abuse Victim	CISS - Coping Inventory for Stressful Situation	MSSCQ - Multidimensional Sexual Self-Concept Questionnaire, BISF -	ANOVA, MANOVA, Mediation analysis	CSA survivors involving touching only were at greater risk of reporting more negative sexual self-concept such as experiencing negative feelings during sex than were non-abused

(continued)

Table 1. Continued

Authors and Year of Publication	Sample	Study Design	Diagnostic/Symptomatology	Emotion or Emotion Regulation Assessment	Sexual Health Assessment	Statistics	Main Results
					Brief Index of Sexual Functioning for Women		participants. Results indicated that emotion-oriented coping mediated outcomes related to negative sexual self-concept while optimism mediated outcomes related to both, negative sexual self-concept and high-risk sexual behaviors.
Rellini et al., 2012	192 young adult women (mean age = 21.8, SD = 3.7, observed range = 18–25)	Cross-sectional	Non-clinical	DERS - Difficulties in Emotion Regulation Scale	SSS- Sexual Satisfaction Scale	Correlation, regressions	Difficulties in emotion regulation demonstrated an incremental effect with regard to sexual satisfaction, but not with intimacy and affection expression.
Fallis et al., 2013	84 married or cohabiting heterosexual couples	Cross-sectional	Non-clinical	Eyes Task - the Reading the Mind in the Eyes task revised version	ISS - Index of Sexual Satisfaction	t-tests, correlation, regression	Both men and women tended to be accurate in perceiving their partners' levels of sexual satisfaction. One sample t-tests indicated that men's perceptions of their partners' sexual satisfaction were biased such that they slightly underestimated their partners' levels of sexual satisfaction whereas women neither over- nor underestimated their partners' sexual satisfaction. However, the gender difference was not significant. Bias was attenuated by quality of sexual communication, which interacted with emotion recognition ability such that when sexual communication was good, there was no significant association between emotion recognition ability and bias, but when sexual communication was poor, better emotion recognition ability was associated with less bias.
Awada et al., 2014	254 couples	Cross-sectional	Women with provoked Vestibulodynia (PVD)	AEQ - Ambivalence Emotion Expression Questionnaire, BDI - Beck Depression Inventory	GMSEX - Global Measure of sexual satisfaction, FSFI - Female Sexual Functioning Index, R-DAS - Dyadic Adjustment Scale Revised	Descriptive, correlation, ANOVA, MANOVA	Couples, in which both partners were considered low on AEE, had the highest scores on sexual satisfaction ($p = .02$) and function ($p < .01$), the lowest depression scores ($p < .01$), and the best dyadic adjustment ($P = .02$).
Van Overveld and Borg, 2014	163 students (mean age = 20.73 years, SD = 2.35)	Experimental	Non-clinical	ERQ - Emotion Regulation Questionnaire, DPSS-R Disgust Propensity and Sensitivity Scale-Revised	SDQ - Sexual Disgust Questionnaire	MANOVA	Up-regulation of mood successfully enhanced general arousal in both groups, yet these arousal levels were not paralleled by reductions in disgust. The findings indicate that emotion regulation training by maximizing positive affect and general arousal could be an effective instrument to facilitate affect-related disturbances in sexual dysfunctions.
Sarin et al., 2014	71 men: 19 controls and 51 clinical	Experimental	Erectile Dysfunction and Hypoactive Sexual Desire Disorder	DERS - Difficulties in Emotion Regulation Scale, PANAS - Positive and Negative Affect Schedule, TAS - Toronto Alexithymia Scale, BDI- Beck Depression Inventory, STAIT - State-Trait Anxiety Inventory	IIEF - International Index of Erectile Function, SIS-SES - Sexual Inhibition and Excitation Scale, SADI - Sexual Arousal and Desire Interview, MSHQ - Male Sexual Health Questionnaire, TIC - Thermal Imaging Camera, SOS- Sexual	ANOVA, Pearson correlations	Genital temperature increased for all groups during the erotic condition, yet men with ED and ED/HSDDD showed less GA than men without erectile difficulties. All groups increased in SA during the erotic condition, yet ED/HSDDD men reported less SA than controls or ED men. SA and GA were highly correlated for controls, and less strongly correlated for clinical groups; men with ED showed low agreement between SA and GA. Groups also differed on body image, sexual inhibition/excitation, sexual attitudes and

(continued)

Table 1. Continued

Authors and Year of Publication	Sample	Study Design	Diagnostic/Symptomatology	Emotion or Emotion Regulation Assessment	Sexual Health Assessment	Statistics	Main Results
					Opinion Survey, Likert-style questions concerning mood, desire, and subjective appraisals of physical and mental arousal		alexithymia. Groups did not differ in general emotion regulation.
Classen et al., 2017	120 women	Experimental	PTSD Complex trauma	DERS - Difficulties in Emotion Regulation Scale; PTGI - Posttraumatic Growth Inventory; TAS - Toronto Alexithymia Scale; IIP - Inventory of Interpersonal Problems; DES - Dissociative Experiences Scale; AAP - Adult Attachment Projective Picture System; PCL - Posttraumatic Stress Disorder Checklist;	Trauma Symptom Checklist-40 — Sexual Problems subscale	ANOVA	Significant improvement over time was found for PTSD symptoms, dissociation, emotion regulation, interpersonal problems, sexual problems, alexithymia, and posttraumatic growth. A third of the women who completed the measures no longer had PTSD post-treatment, and 60% showed a clinically significant reduction in PTSD symptoms.
de Ornelas Maia et al., 2017	48 patients with unipolar depressive disorder and anxiety disorders	Experimental	Depressive and anxiety disorders	BAI - Beck Anxiety Inventory, BDI - Beck Depression Inventory	ASEX - Arizona Sexual Experience Scale	Descriptive, t-tests	Quality of life, anxiety and depression all significantly improved among participants treated with the UP. Some improvement in sexual functioning was also noted. The results support the efficacy of the UP in improving quality of life and sexual functioning in comorbid patients.
Tutino et al., 2017	327 women (mean age = 19.17, SD = 2.29, range = 17–38)	Cross-sectional	Non-clinical	ASI-3 - Anxiety Sensitivity Index 3, DERS - Difficulties in Emotion Regulation Scale, DASS - Depression Anxiety Stress Scale	FSFI - Female Sexual Function Index, Sexual Quality of Life Scale (female), SEQ - Sexual Experiences Questionnaire	Path analysis	Psychological factors predicted orgasm, sexual pain, sexual quality of life, and frequency of partnered sexual activity in women but predicted sexual desire, arousal, lubrication, and frequency of solitary sexual activity to a lesser degree. Emotion regulation significantly accounted for the relation between AS and psychological distress through mediation and moderation pathways.
Gahari et al., 2018	600 women: 300 spouse abused women were compared with 300 non-abused women; mean age = 33.76	Cross-sectional	Intimate partner violence	CERQ - Cognitive Emotion Regulation Questionnaire	Inventory of Sexual Satisfaction	MANOVA	Significant difference between two groups of spouse abused and non-abused women in terms of marital conflicts ($F(1,198)=65.8709$, $p < .000$, partial eta = 0.249), cognitive emotion regulation strategies ($F(1,198)=4.794$, $p < .000$, partial eta = 0.24), sexual satisfaction ($F(1,198)=33.201$, $p < .000$, partial eta = 0.144), and early maladaptive schemas ($F(1,198)= 15.378$, $p < .000$, partial eta = .072); Eta value of above 0.14 indicates high impact in this test.
Pepping et al., 2018	407 adults committed in romantic relationship and 400 adults long-term single	Cross-sectional	Non-clinical	DERS - Difficulties in Emotion Regulation Scale, The Mindful Attention and Awareness Scale	Sexual Satisfaction Scale, Sexual System Functioning Scale	Correlation, t-tests, mediation analyses	Across both samples, dispositional mindfulness predicted more adaptive sexual outcomes, and emotion regulation generally mediated these associations. The positive effects of dispositional mindfulness on sexual outcomes appear to generalize across relationship statuses, with both partnered and long-term single individuals displaying a similar pattern of results. High dispositional mindfulness may predict a range of

(continued)

Table 1. Continued

Authors and Year of Publication	Sample	Study Design	Diagnostic/Symptomatology	Emotion or Emotion Regulation Assessment	Sexual Health Assessment	Statistics	Main Results
							positive sexual outcomes in both partnered and single individuals.
Tutino et al., 2018	306 men (mean age = 19.97, SD = 3.62)	Cross-sectional	Non-clinical	DERS - Difficulties in Emotion Regulation Scale, ASI - Anxiety Sensitivity Scale	MSFI - Male Sex Function Index, SEQ - Sexual Experiences Questionnaire	Descriptive, correlation, path analysis	Men who reported higher anxiety sensitivity (AS) also reported greater difficulties with sexual desire and sexual arousal, and lower sexual quality of life, but not greater difficulties with erection, orgasm, pain, or frequency of partnered or solitary sexual activity. Men who reported higher AS also reported greater severity of psychological distress. Psychological distress appeared to account for some of the relationship (partially mediated) between AS and sexual quality of life and fully mediated AS's relationship to sexual arousal. AS continued to directly predict sexual desire.
Krindges & Habigzang, 2018	8 women over 18 (mean age = 38, SD = 12.7)	Cross-sectional. Mixed method: quantitative and qualitative	Childhood sexual abuse	DERS - Difficulties in Emotion Regulation Scale, semi-structured interview	GMSEX - Global Measure of sexual satisfaction, semi-structured interview	Mean scores	The sexual satisfaction scores presented M = 21.4 (SD = 10.4), and the scores of emotional dysregulation M = 108.2 (SD = 20.4). Qualitative analysis identified 3 subthemes related to emotional self-perception: emotional intensity, emotional dysregulation, difficulties handling emotions. Regarding sexuality: sexual satisfaction, premature sexual desire, hypersexuality, sexual aversion and sexual risky behaviors.
Berenguer et al., 2019	340 participants: 228 women and 112 men	Cross-sectional	Non-clinical	TAS - Toronto Alexithymia Scale, MAIA - Multidimensional Assessment of Interoceptive Awareness	FSFI - Female Sexual Functioning Index, FSIDS -R - Female Sexual Distress Scale - revised, IIEF - International Index of Erectile Function	Correlations	Greater alexithymia correlated with lesser interoceptive awareness. For women, greater alexithymia and lesser interoceptive awareness correlated with lesser arousal, lesser lubrication, more orgasm difficulties, more dissatisfaction, more pain, and more sexual distress. Higher female desire correlated with greater interoceptive awareness, but was unrelated to alexithymia. In men, lesser interoceptive awareness correlated with more difficulties delaying ejaculation, and greater alexithymia correlated with more erectile difficulties.
Dubé et al., 2019	87 couples (mean age of women = 31.52, SD = 7.83; mean age of men = 32.86, SD = 9.43)	Cross-sectional	Female sexual interest/arousal disorder	DERS- Difficulties in Emotion Regulation; ERQ - Emotion regulation questionnaire; BDI – Beck Depression Inventory; STAI – State-Trait Anxiety Inventory; DAS – Dyadic Adjustment Scale; CSI – Couples satisfaction Index	DSM-5 Clinical Interview	Bivariate correlations, APIM	Women report of greater difficulties regulating negative emotion, reported greater depression and anxiety, and when men reported more of these difficulties, they had greater depression, anxiety, and sexual distress. Women with FSIAD reported lower relationship satisfaction. When women reported greater emotional suppression, they reported greater depression and anxiety, and lower relationship satisfaction; when they reported greater use of emotional reappraisal, they had fewer symptoms of depression and anxiety, and their partners reported lower dyadic conflict. When men reported greater emotional suppression, they had greater depression, lower relationship satisfaction, and sexual desire; when they reported greater emotional reappraisal, they had lower depression and anxiety, higher relationship satisfaction, lower dyadic conflict,

(continued)

Table 1. Continued

Authors and Year of Publication	Sample	Study Design	Diagnostic/Symptomatology	Emotion or Emotion Regulation Assessment	Sexual Health Assessment	Statistics	Main Results
Yeung et al., 2019	176 men (mean age = 50.2 years, SD = 8.49; mean marriage years = 26, SD = 9.47)	Cross-sectional	Husbands of breast cancer survivors	AEQ - Ambivalence over Emotion Expression Questionnaire; CSI - Couple Satisfaction Index; CAS - Cognitive Appraisal Scale	IWQOL-Lite - Sexual Life subscale of the Impact of Weight on Quality of Life;	Descriptive, hierarchical regression	higher sexual desire and women reported higher relationship satisfaction and lower dyadic conflict. Lower caregiving burden ($\beta = -0.34, p < .001$), higher marital satisfaction ($\beta = 0.20, p < .001$), and lower harm/threat appraisals (β from -0.22 to $-0.20, p < .001$) were associated with better sexual QoL. Ambivalence over emotional expression was found to moderate between protective buffering and sexual QoL ($\beta = 0.20, p < .01$), such that the negative association between protective buffering and sexual QoL was only significant among those with higher AEE ($\beta = -0.38, p < .003$).
Kazour et al., 2019	30 men and 30 women, aged between 25 and 60 years old (20% aged between 25–35 years; 45% between 35–50 years and 35% more than 50 years)	Cross-sectional	Schizophrenia	MATHYS - Multidimensional assessment of thymic state	SBQ – Sexual Behavior Questionnaire	Descriptive, bivariate analysis	Patients who masturbate showed higher mean emotional score, higher cognitive functioning score, higher motivation score, higher motor deficit score, higher sensory perception score, higher SBQ score, and higher emotional reactivity compared to those who did not.
Vasconcellos et al., 2019	220 women (mean age = 27.73 years, SD = 8.46)	Cross-sectional	Self-reported sexual dysfunctions	SCS - self-compassion scale; DERS - difficulties in emotion regulation scale.	FSFI - Female Sexual Function Index),	MANOVAs	Women with self-reported sexual dysfunction and particularly women with self-reported sexual pain report lower self-compassion (p values ranging between 0.001 and 0.044) and more difficulties in emotion regulation (p values ranging between 0.003 and 0.023) than women without sexual problems.
Connor et al., 2020	207 participants	Cross-sectional	Vulvodynia	MRQ - Multidimensional Rumination Questionnaire; COPE scale; ratings of emotional satisfaction engaging in sexual activities and on sexual communication with partner	Vulvalgesiometer,	Correlations, linear regression models	Emotion-based rumination predicted lower sexual satisfaction.
Castellini et al., 2020	133 female participants, 72 with eating disorders and 61 controls	Cross-sectional	Eating disorders	DERS - Difficulties in Emotion Regulation Scale; BIS 11 - Barratt Impulsiveness Scale; SCL-90-R - Global Severity Index of the Symptom Checklist-90-Revised; CTQ - Childhood Trauma Questionnaire; EDE-Q - Eating Disorder Examination Questionnaire	FSFI - Female Sexual Function Index; HBI – Hypersexual Behavior Inventory	ANCOVA, ANOVA, moderation	Hypersexuality was associated with severe psychopathology, emotion dysregulation, childhood trauma, adverse consequences, and higher ghrelin levels. Moderation analyses showed that hypersexuality was associated with emotion dysregulation and psychopathology only in those patients reporting childhood traumatic experiences.
Pawlowska, Borg & de Jong, 2021	Women with no sexual difficulties (N= 255, Mage = 20.55; SD = 2.23)	Experimental	Non-clinical	DPSS-R -Disgust Propensity and Sensitivity Scale Revised; VAS- Visual Analogue Scale	SES/SIS-SF -The Sexual Excitation/Sexual Inhibition Scales – Short Form; BSSC - The Brief Sexual Symptom Checklist	t-tests, ANOVA	Instructions to up-regulate sexual arousal successfully enhanced feelings of sexual arousal in the unprimed group, but the increase in sexual arousal was not paralleled by reductions in feelings of disgust. Instruction to down-regulate disgust successfully decreased disgust; however, this decrease was not paralleled by increases in sexual arousal. Emotion regulation techniques can facilitate affective control in sexual contexts.

sexual functioning, decreased anxiety, depression and post-traumatic stress disorder.^{45, 58} This is supported by the notion that couples' sexual problems should be addressed focusing on the emotional life of the couple and on the ER abilities of each individual, supporting the notion that ER training may help in the management of affect-related sexual disorders.^{56, 64} Such ER management may facilitate sexual activity, and as observed during the COVID-19 pandemic, sexual activity may help to prevent or alleviate psychological distress and have a positive effect on relational and sexual health.⁶⁵

Indeed, the findings from the experimental studies support the application of current ER models (eg, Gross' model) to sexual health. Experimental manipulations of ER via attentional deployment, cognitive change (cognitive reappraisal) and response modulation indicate that ER processes can change sexual health outcomes, such as sexual arousal.^{54–57}

Based on this review we suggest that new intervention studies should be conducted applying existing, adjusted or newly designed emotion regulation-based interventions for sexual health difficulties. It stands to reason that particularly ER interventions should be investigated further, which have already shown promise in the treatment of the mental health comorbidities associated with sexual dysfunctions.^{15, 59, 66}

To date, and despite the few randomized controlled trials of ER interventions for sexual health, studies like the de Ornelas Maia⁴⁵ show promising results for the use of trans-diagnostic approaches, for instance the Unified Protocol, which encompasses psychoeducational components of emotions as well as strategies to cope with them. In addition, a recent systematic review on mindfulness meditation-based interventions for sexual dysfunctions⁶⁷ suggests positive effects, despite methodological weaknesses of the studies included in the review (eg, patient selection, small sample sizes, complex interventions and lack of homework assessment. In line with this finding, mindfulness-based and acceptance interventions have been proposed for prostate cancer survivors.⁶⁸ Mindfulness-based approaches may enhance ER capacity, as they reinforce being in the present moment and to not suppress any emotion or intrusive and/or uncontrollable thoughts.

As this scoping review shows, research on ER and sexual health has developed in the past few years with the vast majority of included studies being published since 2012.

Considering the application of the biopsychosocial model to the area of sexual health, and the necessity for trans-diagnostic approaches, we would expect the number of well-designed studies in this area to grow further in the next few years. These studies should include constructs not considered in the present review, which partially overlap with ER, such as alexithymia and emotion-related impulsivity traits (ie, urgency, see Billieux, 2017).¹³

While broad in scope the present review provides a first summary of the state of the art regarding the role and importance of

ER for sexual function and satisfaction. As previously suggested, more research is needed to investigate how the regulation of emotion is associated with sexual (dys-)function and distress.²² We feel it is important to acknowledge (i) the need for more research on the role of ER in the development and maintenance of sexual disorders and (ii) the need for randomized controlled trials investigating the efficacy of sex therapy interventions including emotion regulation-based interventions in the management of sexual health problems.

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