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FEMALE SEXUAL DYSFUNCTION IN THE CONTEXT OF MARITAL INTIMACY

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List of Abbreviations

a, b, c – Mediation pathways in Mediator model. a: independent variable → Mediator;

b: Mediator → dependent variable; c: Independent variable → dependent variable

B_{stand}, $B_{unstand}$ –B Regression Coefficient in the SPSS software; $B_{standardized}$ coefficient is used to compare the strength of the effect of each independent variable, the largest has the strongest effect (independent of the sign); $B_{unstandardized}$ Regression Coefficient indicates the average change in the dependent variable associated with 1 unit change in the dependent variable, (statistically controlling the others)

CBT- Cognitive Behavioral Therapy; CI - Confidence Intervals

Cronbach's alpha - is a coefficient of reliability (alpha > 0.7 acceptable)

CSI - Couples Satisfaction index; DSM - Diagnostic and Statistical Manual of Mental Disorders

E[Frequency] – Calculated expected frequency based on FSFI domain response

ER – Effect Ratio (indirect effect divided by total effect); FSD – Female Sexual Dysfunction, FSI and AD – Female Sexual Interest and Arousal Disorder

FGPPD -Female Genito-Pelvic Penetration Disorder

FSFI-6 – Female Sexual Satisfaction Index-6; HSDD- Hypoactive Sexual Desire Disorder

IOS - Inclusion of the Other in the Self ; IQR – The interquartile range is a measure of variability, based on dividing rank-ordered data set into4 equal parts. IQR = Q_3-Q_1

ISF- Impaired Sexual Functioning; MI – Marital (Relational) Intimacy ≡ Perceived Level of Intimacy: a sum of the standardized results of the SSSW-30, IOS, MSIS-17, and CSI-16 scores for each participant ≡ Intimacy in this study

LLV- life-long vaginismus

MNBR - Multivariable Negative Binominal Regression; MSIS - Miller Social Intimacy Scale

N – is the Number of the responses; NBR – Negative binominal regression

p value – probability value (between 0-1) (statistically highly significant $p<0.001$)

r – Pearson correlation coefficient ($-1 < r < 1$); SE – Standard Error; SD –Standard Deviation

SSS-W - Sexual Satisfaction Scale for Women

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Chapter 1: INTRODUCTION: CLINICAL RELEVANCE OF STUDYING MARITAL INTIMACY AND FEMALE SEXUAL DYSFUNCTION

The issue of female sexual dysfunction within the context of marital intimacy has long intrigued both researchers and clinicians. Theory after theory was born mainly within the context of a given theoretical orientation. Mark Twain once famously wrote: "To a man with a hammer, everything looks like a nail". This saying has been certainly true of research on female sexual function and dysfunction, starting from Sigmund Freud's psychoanalytic take of all pathology being traced back to conflict between sexuality and higher psychological functions (Van Haute, 2013), all the way to modern pharmacological approaches based on the role of androgens and agents focused on influencing the central nervous system (CNS) in increasing behaviors associated with increasing appetitive sexual desire in women (Pfaus et al 2007).

1.1 Purpose of Dissertation

The purpose of this dissertation is to examine female sexual dysfunction (FSD), especially desire and pain disorders, in the context of marital intimacy based on two original research studies the author carried out on a unique clinical sample and two reviews. Desire and pain disorders, the most frequent presenting problems of all female sexual problems in a clinical setting, were chosen as the focus of the dissertation in the context of marital intimacy.

The author reviews the history of diagnostic considerations for Female Sexual Interest and Arousal Disorder, the ongoing differences between psychiatric and other sexual medicine diagnoses. The opposing viewpoints between these two camps is nowhere as intense as when it comes to the conceptualization of female sexual desire. Psychiatric diagnoses of FSD and their psychological treatments are based on phenomenological conceptualizations of disorders using observations about symptomology and patient report. This method of categorizing disorders has been criticized as limited in reflecting relevant

hormonal, neurobiological, genetic and behavioral components underlying the particular disorder. It has also been noted as "impeding progress in psychiatry (Cuthbert et al 2013).

Since the goal of diagnosis is to determine the exact nature of a patient's presenting problem to administer the optimal treatment, different classification systems all reflect their own respective conceptualizations behind what the "exact nature of "a particular disorder is, in this case, female sexual disorders. To illustrate the diversity of such diagnoses, author includes a general overview of nomenclature of female sexual disorders with an eye to low sexual desire, called Female Sexual Interest and Arousal Disorder (FSIAD) in the DSM-5 and Hypoactive Sexual Desire Disorder (HSDD) in the ICD and ICSM.

Sexual pain disorders, namely Female Genito-Pelvic Penetration Disorder (FGPPD) will be explored in a systematic review. Author chose to use ICSM and ICD nosology for this review since both of those systems explore in more detail the cause of sexual pain disorders. The DSM does not integrate fundamental neurobiological and experiential components that comprise these disorders; consequently, the DSM lags behind these other classification systems when it comes to sexual pain diagnoses. Clearly, one reason for this is the nature of psychiatric diagnosis and clinical psychological treatment: to rule out hormonal or organic causes more diagnostic tests would need to be carried out, which is not practical in these settings. To bridge this gap in diagnosis and treatment, a widely promoted approach in the field is utilizing multidisciplinary teams, which involves a comprehensive approach, including a psychological and relational workup followed by medical treatment, if necessary. Multi-disciplinary treatment teams have become acknowledged as the ideal approach to complex FSD (Spoelstra et al., 2011; Tan et al., 2017). This will be discussed later in this dissertation in the context of FGPPD.

This dissertation also reports on two original research studies carried out by the author on a unique clinical sample in the context of heterosexual long-term relationships, namely the marriage relationship. The results of these studies point to the importance of taking the context and quality of the marriage relationship into consideration when choosing treatment methods for FSD.

Psychiatric disorders such as Major Depressive Disorder and Bipolar Disorder, have been associated with altered sexual function. Consequently, medications treating these psychiatric illnesses also affect sexual function, and in some cases, exacerbate it. Older

antidepressants such as tricyclic antidepressants, SSRIs, and monoamine oxidase inhibitors are frequently associated with sexual dysfunction (Lee et al., 2010)

Chapter 2: FEMALE SEXUAL DYSFUNCTION: COMMON PREDICTORS AND ASSOCIATIONS

2.1 Prevalence Rates

Based on published prevalence studies among women with sexual difficulty in the general population it has been reported that on average 64% experienced desire difficulty, 35% experienced orgasm difficulty, 31% experienced arousal difficulty, and 26% experienced sexual pain but only a portion of these women experienced distress about these difficulties (Hayes et al., 2006). Other meta-analytic studies have noted lesser prevalence in premenopausal women (40.9%) and prevalence rates of individual sexual disorders ranged from 20.6% (lubrication difficulties) to 28.2% (hypoactive sexual desire disorder) (McCool et al., 2016). Hormonal changes such as menopause and other medical problems will increase the likelihood of FSD (Addis et al., 2006; McCabe, Sharlip, Lewis, et al., 2016; Shifren et al., 2008).

However, prevalence rates will also vary across the globe based on geographical and cultural settings. For example, in a study of Muslim women in Iran, Haghi et al. found 73.7% of their sample complaining of sexual problems (Haghi et al., 2018). U.S.–based prevalence rates in a clinical setting were lower (7.4% for HSDD) when the diagnosis of Hypoactive Sexual Desire Disorder was made by a trained health-care professional instead of self-report (Rosen et al., 2012). The discrepancy in numbers between the Rosen study and other population-based studies illustrates a problem that researchers often run into; exact prevalence rates of diagnosable sexual disorders are difficult to determine. Self - report complaints often do not translate into a medical diagnosis made by a trained health care professional. DSM-5 diagnoses require a minimum duration of 6 months and significant distress associated with the problem. This is important to mention since the two original research studies detailed in this dissertation were carried out on a clinical sample using validated instruments.

While it is sometimes hard to distinguish between medical or psychological factors related to a sexual disorder, prevalence rates of FSD are 6.5 times higher among women with a self-reported mental health diagnosis and those women who experience pain during sex are 7 times more likely to develop an FSD (Kim et al., 2022) Kim et al, in this large, cross-sectional design study, correlated FSD as it is measured by sexual frequency, with lower socio-economic status. While this study does not detail the social determinants of being at risk for FSD and low sexual frequency, author of this dissertation speculates, based on her own research findings, that both social and relationship stressors may play a role in this correlation.

2.2 Common Predictors of FSD in Relationships

A sexual dysfunction is a disturbance in sexual functioning involving one or multiple phases of the sexual response cycle or pain associated with sexual activity. Consequently, various psychological, medical or physiological mechanisms may negatively influence one's sexual response to sexual stimuli. Relationship factors have been shown to be predictors of sexual function. Illustrative of this, research reports that starting a new relationship, where a person is more likely to have a positive perspective on their partner, is accompanied by stronger feelings of desire (Klusmann, 2002). Conversely, habituation, associations of sexual activity with negative outcomes such as physical pain or negative relational experiences will predict negative sexual responses. Relationship satisfaction declines over time however this does necessarily mean a decline in sexual satisfaction. More importantly, attitudes towards one's partner is a predictor of relationship satisfaction, which in turn is a predictor of sexual satisfaction. More positive automatic partner attitudes should lead to more positive evaluative judgments of the relationship and more negative automatic partner attitudes should lead to more negative judgments (Hicks & McNulty, 2019).

Love seems to be a stronger predictor for women for sexual activity than desire is, and this is also true for women with FSD (Vowels & Mark, 2020; (Neto, 2012).

Women's desire for sex appears to be motivated by relationship factors, such as ways to express love and not wanting to "hurt their partner's feelings" and "prioritize their partner's enjoyment before their own" even when FSD is present (Elmerstig et al., 2013)

2.3 Common associations of FSD

It is beyond the scope of this dissertation to provide a detailed overview of medical and psychological factors associated with FSD. However, it is important to mention at least the most typical medical conditions associated with sexual dysfunction. These include neurologic diseases such as multiple sclerosis, and spinal cord injury; atherosclerosis and other cardiac diseases; gynecologic conditions such as endometriosis, inflammation, fibroids, infections, and prolapse, as well as obstetrical conditions related to previous operative delivery, perineal tears, rectoceles, or episiotomy after delivery. Hendrickx et al. found that among women with provoked vestibulodynia, a chronic pain disorder, relational intimacy uniquely predicts better self-reported sexual functioning independent of sexual intimacy and partner intimacy (Hendrickx et al., 2015). This finding is in alignment with the results of author's own research studies, detailed later in Chapters 7-12.

Psychological factors such as individual trait factors, cognitive distractions, efficacy expectations, attentional focus, anxiety, trauma history and low mood are all important dimensions of sexual function (Bergeron et al., 2010). For menopausal women, it is recommended to initiate routine clinical investigation of psychological factors and life stressors and to address contextual factors that can precipitate and maintain sexual difficulties, including relationship quality, sexual experience, previous sexual function, mental and physical health (L Brotto et al., 2016; Lori Brotto et al., 2016; Worsley et al., 2017).

Women with a history of sexual trauma are more likely to report poorer relationship satisfaction and lower sexual function. For such women, who are already at a higher risk of developing FSD, lower sexual function and lower sexual satisfaction mediates the association of their trauma and their relationship satisfaction. (Blais, 2020).

Early attachment style and relationship attachment style are both associated with sexual function, dysfunction, most specifically sexual desire. Cherkasskaya and Rosario, in a description of their sexual desire theory, stated that "women's internalized representations of self and other that stem from childhood and their capacity to embody their sexual bodies are integral to our understanding of the phenomenology of sexual desire in women" (Cherkasskaya & Rosario, 2019). The primacy of attachment style in their theory was met

with some criticism as other authors emphasized factors such as cultural pressures and relations factors associated with women's sexual desire (Bogaert et al., 2019).

2.4 Age, Length of Relationship and Sexual Function

Age will inevitably impact sexual function. There are situational stressors, stage-of life stressors and hormonal issues that will change across the lifespan and influence sexual function for women of different ages. Some research shows a negative association between aging and sexual desire is particularly pronounced among women experiencing lower relational intimacy in their relationships with sexual intimacy mediating the association between relationship length and sexual excitement. (Birnbaum et al., 2007). Over time, women's sexual desire tends to decline more than men's, which doesn't decline on average. Declines in women's sexual desire is accentuated by childbirth and is a predictor in both partner's marital satisfaction. (McNulty et al., 2019).

Partners will often experience changes in the level of their sexual desire, their passion towards each other will likely wane over time. Regardless of this phenomenon, what seems to be a determining factor in couple sexual satisfaction is not so much the level of passion a partner has towards the other but more so how aligned the two partners are in their level of desire for each other. Sexual desire discrepancy (SDD), the difference in levels of desire between partners, is an important determinant of sexual satisfaction. Even though SDD is not a sexual dysfunction per se, and it may or may not be underlined by a clinically diagnosable sexual problem, it is an important building block in conceptualizing female sexual dysfunction in a dyadic setting. It is also one of the most frequent presenting problems in therapy given the levels of significant distress it can cause for partners (Jodouin et al., 2021).

2.5 Hormonal Associations of FSD

There is an ongoing debate about the amount of influence that androgens have on female sexual functioning. There is evidence for a link between sexual desire and particularly arousability with androgens, but the research findings are not univocal. Postmenopausal women seem to benefit from transdermal testosterone for low sexual desire, current available research supports a moderate therapeutic benefit, while this has not been proven

to be the case for premenopausal women. (Achilli et al., 2017; Both et al., 2010); Simon & Kapner, 2020). Interestingly, among these many factors that influence FSD and female sexual frequency is mate-guarding behavior. Fertile-phase, younger women are perceived by other women with attractive partners as a threat and are more often responded to with jealousy and mate-guarding (Hurst et al., 2017).

Since testosterone therapies have become highly popular in clinical practice among both primary care and sexual medicine practitioners, the International Society for the Study of Sexual Health (ISSWSH) has recently released its clinical guidelines for systemic use of testosterone in women with hypoactive sexual desire disorder (HSDD- nosology used by ISSWSH for low sexual desire). In its guidelines ISSWSH cautions practitioners to refrain from using total testosterone levels to diagnose HSDD (Handy et al., 2020; Parish, Simon, et al., 2021).

Chapter 3: FEMALE SEXUAL INTEREST/AROUSAL DISORDER: HISTORY OF DIAGNOSTIC CONSIDERATIONS AND THEIR IMPLICATIONS FOR CLINICAL PRACTICE

Low sexual desire, also called Hypoactive Sexual Desire Disorder or Sexual Interest/ Arousal Disorder, is a type of Female Sexual Dysfunction (FSD). This section reviews diagnostic considerations, a historical overview of how current DSM-5 diagnostic criteria was developed, including a crossover from DSM-IV-TR to DSM-5, diagnostic considerations in pharmaceutical treatments for low female sexual desire as well as the predominant sexual response cycle models that DSM-5 criteria was built on. It provides a historical overview of the two majorly divergent camps of perspective, namely the DSM-5 and the ICSM/ ICD classification systems, their theoretical and research basis. It concludes that female sexual desire is a rather complex phenomenon and a mechanism set in motion by intricate hormonal, emotional, relational and biological processes. Psychiatrists are well-suited in both recognizing, diagnosing and treating female sexual desire problems. Authors of this review encourage flexibility and a patient focused approach in clinical practice, which would both require utilizing a biopsychosocial perspective and the use of a multi-specialty team.

Female desire is more complex, flexible and more individualistic than male sexual desire (McCarthy et al., 2018). Baumeister in his discussion on gender differences and the plasticity of erotic drive, described the female sex drive as socially flexible and responsive to situations (Baumeister et al., 2000). Responsive desire is a concept that is described to take place within the incentive motivational model of desire. It does not occur spontaneously but rather responds to a given situation in which a diverse set of circumstances trigger sexual stimuli, subsequent sexual arousal and desire (Carvalheira et al., 2010) and measured by the recently developed Measure of Responsive Sexual Desire instrument (Velten et al., 2020).

Differences between male and female sexual desire are intricately complex, starting from hormonal underpinnings to social, religious and cultural expressions of it. For centuries it has been believed that female and male sexual desire are at stark contrast with each other and represent solidified stereotypes for each gender such as: “men always are ready to have sex” and “women seldom want it”. Many have grappled extensively with attempting to understand sexual desire both through scientific inquiry and through integration of religious and psychological aspects of human sexuality: “God created sexuality to reveal the value He places on intimate relating” is a traditional conceptualization among Christian psychologists (Rosenau & Sytsma, 2004). A similar focus on the intimate aspect of the sexual relationship has characterized psychological treatment approaches. Sexuality has been described as a dimension of various relationship constructs such as intimacy, love, exchange and maintenance behaviors (Sprecher & Cate, 2004).

Marriage and family therapists frequently work with their patients to strengthen commitment, increase intimacy and consequently increase sexual satisfaction. In fact, a bidirectional relationship between commitment and sexual satisfaction has been observed, with each variable predicting the other (Seiter et al., 2020). Even though people in well-maintained and committed long term relationships tend to construe their partners more positively (de Jong & Reis, 2015), this does not necessarily result in more sexual satisfaction or better sexual function. This means that even couples with high relationship satisfaction and feelings of intimate connection may suffer from sexual problems.

Conversely, family conflict, relational conflict and comorbid psychiatric disorders are highly correlated with sexual dysfunction (Boddi et al., 2015) .

Along with some shifts in Western cultures and with more scientific research on sexual problems, came the recognition of both men and women complaining about desire problems and in similar numbers (Lau et al., 2005). Baumeister et al reviewed gender differences in sex drive ("the *sex drive* refers to the sexual motivation, usually focused on craving for sexual activity and sexual pleasure") and concluded from several sources that men "want more sex than women" and a tentatively concluded that "men have higher sex drive than women" (Baumeister et al., 2001). More recent research attempts to fine tune Baumeister's conclusions explaining that sexual desire emerges similarly in men and women and that other factors may influence the observed gender difference in sexual desire (Dawson & Chivers, 2014).

The notion of men "always being ready" was challenged by common male sexual disorders gaining more visibility: erectile dysfunction, anejaculation, premature ejaculation, chronic neurological illness and a host of other problems (Bancroft & Janssen, 2000).

As some of these male disorders were offered pharmaceutical solutions attention shifted to low female sexual desire, which is still the most prevalent complaint in sexual medicine clinics. Unlike male desire problems, which are often secondary to a medical condition, female sexual desire is typically primary, subject to shifts in circumstances and the relational context. The late author and sexual medicine specialist, Sandra Leiblum, writes "certainly, a serious flaw in the "drive" theory of desire is the erroneous belief that the internal or spontaneous experience of desire is not only ubiquitous but a necessary prerequisite to the experience of sexual arousal. In fact, several sex researchers persuasively argue the opposite, namely, that desire is more often secondary to arousal. It is the awareness of arousal, whether genital or subjective, that is basic in both triggering and maintaining sexual desire" (Leiblum, 2010). This assertion of desire being secondary to arousal is in the backdrop of many psychological theories and treatments of female intimacy complaints. The validity of this approach is evident in the light of sexual issues being relational

Addressing such a complex and personal issue often poses difficulties in health-care settings. A study investigating clinical practices of Obstetrics and Gynaecology physicians in addressing sexual issues with their patients found that the majority of Ob/gyns do not routinely ask questions to assess for sexual problems or dysfunction. The same study also found that Ob/gyns who report to be religious tend to address sexual practices and are more likely to express concerns and disapproval of patient's controversial sexual practices (Sobecki et al., 2012).

While Ob/gyn doctors are an important point of contact in sexual healthcare so are psychiatrists. Psychiatrists, however, are even less likely than ob-gyn doctors to ask about patient's sexual health even when they suspect sexual difficulties, citing "lack of competence" and "not having a sexual medicine network to refer patients to" as reasons for not inquiring about patient's sexual practices or sexual function (Seitz et al., 2020). In a survey-based study among Austrian psychiatrists, Seitz et al found that psychiatrists who are trained in sexual health are more likely to ask about sexual issues. Their findings point out that psychiatrists tend to not initiate inquiries about a patient's sexual health even when they suspect such problems to be present, they are more likely to discuss sexual issues when the patient brings up the issue and none of the psychiatrists in the survey offered to provide sexual therapy to patients (Seitz et al., 2020). Clearly, familiarity with and training in sexual disorders could greatly enhance efficacy and patient care in psychiatric practice.

Sexual dysfunction may rarely present in a vacuum, apart from other mental illnesses or medication regimens, in a psychiatric setting. In fact, psychiatric disorders are the most important risk factors for female sexual dysfunction. In a sample of older patients, with a mean age of 75, Wang et al. reported the quality of a patient's sexual health is linked closely to mental health, more closely than physical function, anxiety, stress or age itself (Wang et al., 2015).

Comorbidity between depression, anxiety, bipolar disorder and sexual dysfunction is a common clinical observation among psychiatrists and has been subject to much research (Basson, 2018; Basson & Gilks, 2018). However, the link between these psychiatric disorders and sexual function is not yet clearly understood. Current research points in the direction of a "shared underlying latent psychiatric comorbidity", suggesting that when a

person is at risk for any of these psychiatric disorders, he or she is also at risk for sexual dysfunction (Forbes et al., 2016).

Given the fluid nature of female sexual desire, identifying diagnostic criteria which is objectively measurable, research-based and subject to the same stringent clinical trial standards as other medical conditions has been rather challenging, according to some, even unrealistic (Brotto et al., 2017). Creating diagnostic criteria, nomenclature and nosology for female low sexual desire has been subject to much debate and the sexual medicine community has grappled with finding a unified voice on it (Parish, Cottler-Casanova, et al., 2021; Parish, Simon, et al., 2021).

One manifestation of this division in the sexual medicine community has been the publication of reviews on female low sexual desire; typically, either written from a medical (hormonally supported biological drive) or a psychological / relational treatment perspective, the latter supportive of DSM-5 changes (Thomas & Gurevich, 2021). Opponents of DSM-5 changes intend to strengthen their arguments by basing their reviews on HSDD nosology and DSM-IV-TR criteria, focusing on "erroneous" changes in the new diagnostic system such as "distress" no longer being a criterion for FSIAD in the DSM-5 (Parish, 2016; Parish & Hahn, 2016). This review provides a historical overview of these divergent camps of perspective, their theoretical and research basis Table 1.

Table 1. Sexual Dysfunction Nosology

Models of Classification
ICD-10/11 (International Classification of Diseases) 10 is current (since 5/1990) — 11 use begins 1/2022
DSM-5 (Diagnostic and Statistical Manual)
AFUD (American Foundation for Urologic Disease)
ICSM (International Consultations on Sexual Medicine)

3.1 Prevalence Rates for Female Low Sexual Desire

Low sexual desire, also called Hypoactive Sexual Desire Disorder or Sexual Interest/Arousal Disorder is one of the most common presenting problems in sexual

medicine practices. For the sake of simplicity, we have chosen to follow DMS-5 nomenclature (Female Sexual Interest/Arousal Disorder, FSIAD) in this review when referring to low sexual desire among women.

The prevalence rates of FSAID are difficult to determine given that epidemiological studies tend to use a variety of diagnostic measures and rely on convenience samples and patient self-reports. However, studies show the highest prevalence rates of FSD in Africa and the lowest rates in the non- European West, where gender equality is the societal norm. (McCool-Myers et al., 2018). Most systematic reviews on female sexual dysfunction and low sexual desire in women have encountered a variety of obstacles, mainly the lack of a universally accepted nomenclature, nosology and diagnostic systems (McCool-Myers et al., 2018). The first systematic review scanned the epidemiological studies between 1921-1981 and reported prevalence rates for inhibited desire in women ranged from 1% to 35% (Nathan, 1986). In a systematic review of the literature on female sexual dysfunction prevalence and predictors, West et al. found rates of sexual dysfunction that ranged from 1% to 50% for desire disorders (West et al., 2004). In an epidemiological study, Laumann and colleagues have assessed the prevalence and risk of experiencing sexual dysfunction across various social groups in the US. Using a probability sample design, they estimated the prevalence rate of generalized Female Sexual Dysfunction, which encompasses a variety of sexual problems, and uses broad, heterogenous definitions, to be 43% in the U.S. population of women, 18 to 59 years old (Laumann et al., 1999). However, as Parish points out this often cited yet dated study did not assess the prevalence rate of low sexual desire according to current diagnostic criteria, did not measure distress and consequently was unable to asses frequency of low sexual desire as an actual sexual disorder (Parish, 2016; Parish & Hahn, 2016).

Another study (Table 1) of over 50 thousand US women found sexual problems to be affecting 22% of women and sexual distress affecting mainly women of ages 45-64 (14.8%). Younger women were less affected (10.8%) and so were older women (8.9%) (Shifren et al., 2008). A European study of patients attending primary care practices in London reported sexual problems to be common with 40% of women receiving one or more ICD-10 diagnosis (Nazareth et al., 2003). Parish reported that HSDD significantly affected the lives of approximately 8.9% of U.S. women between the ages of 18 and 44,

12.3% ages 45 to 64, and 7.4% over 65. (Parish & Hahn, 2016; Shifren et al., 2008). Low desire was the most common of the three sexual problems among women of all ages in this study.

A newer prevalence study carried out in Germany, using an instrument based on ICD-11 diagnostic guidelines, reported a 45.7% prevalence rate of some type of sexual dysfunction among sexually active women in the last 12 months (Briken et al., 2020). In a population based, cross -sectional study of 1000 Iranian women, using two validated diagnostic measures; the Sexual Interest and Desire Inventory- Female (SIDI-F) and the Female Sexual Distress Scale (FSDS), Hamzehgardeshi et al. observed several correlates of FSD. They reported that the age of first intercourse (young age indicated more sexual difficulties and higher likelihood of low sexual desire), financial dependency and financial problems all indicated risk for having sexual problems (Hamzehgardeshi et al., 2020).

In a systematic review and meta-analysis Koops et al selected studies that use one of the most widely used instruments to measure sexual dysfunction; the Female Sexual Function Index (FSFI) (Koops & Briken, 2018) reported prevalence rates are subjected to be influenced by the type of instrument and diagnostic criteria used to measure dysfunction, authors of the Koops study took an important step in the direction of assessing FSD worldwide by selecting studies that used the same instrument in order to allow for better comparability. However, numerous difficulties arose in this systematic review which disallowed for a final comparability across the sample: studies used varying cutoffs adopted to determine the prevalence rates, differences in the settings in which the data was collected, demographic restrictions, differences in inclusion and exclusion of data and the assumption of difficult to measure confounding factors, such as cultural differences. After all, the Koops et al study did observe a trend towards high prevalence rates of sexual difficulties and complaints, even though they may not necessarily be diagnosable.

To date, authors of this article do not know of any epidemiological studies and prevalence rates of female sexual problems in Hungary. While not directly related to the topic of low sexual desire, a large sample-based study on sexual behaviors was carried out in Hungary. In a community-based, online questionnaire study, which included 1043 participants in Hungary, Hevesi and colleagues investigated orgasmic behaviors, pornography use and sexual response (Hevesi et al., 2020; McNabney et al., 2020).

Rosen et al identified correlates of personal distress among women with low sexual desire based on a subset of a large epidemiological survey called the "The Prevalence of Female Sexual Problems Associated with Distress and Determinants of Treatment Seeking", PRESIDE, for short. The original PRESIDE study was a large, cross-sectional, nationally representative, mailed survey of U.S. adult women investigating the prevalence of self-reported sexual problems in women(Rosen et al., 2009; Shifren et al., 2008). The PRESIDE study found that distressing sexual desire problems typically peak in the middle years and decline as women age. More specifically, age-adjusted estimates for distressing sexual problems were desire 10.0% and 9.5%; arousal 5.4% and 5.1%; orgasm 4.7% and 4.6%; and any 12.0% and 11.5%, respectively. Another finding of the PRESIDE study, pertinent to psychiatric practice, is the odds of having a distressing sexual problem increasing with worse self-assessed health, compared to excellent self-assessed health, and being almost 20% higher in post-menopausal women. Not surprisingly, having a psychiatric disorder, depression and anxiety in particular, is highly associated with low sexual desire (odds ration 2.34 for depression) but so is thyroid disorder or urinary incontinence (Shifren et al., 2008). Comparing these prevalence rates of sexual problems to other studies is difficult, given the fact that both the PRESIDE study and numerous previous studies include self-report data (Koops & Briken, 2018).

In consistence with the original PRESIDE study, Rosen et al also found that sexual distress is less prevalent than the presence of sexual disorders in women. This finding is particularly important within the ongoing debate about diagnostic criteria and exactly how much weight should be given to clinically significant patient self-reported distress in determining the presence of sexual dysfunction. They also found that age was a common correlate of distress (the presence or absence of distress about one's low sexual desire) as well as having a partner was strongly correlated with distress. Women without sexual distress, who also have low sexual desire, tend to be older, in fact about 10 years older, than the average age of a woman (35-64) with low sexual desire and sexual distress.

Results of prevalence from the PRESIDE study are illustrated in Table 2.

Table 2 Prevalence of Female Sexual Dysfunction (PRESIDE)

Sexual Complaint	Sexual Problem	Sexual Problem Plus Distress
Desire	38.7%	10.0%
Arousal	26.1%	5.4%
Orgasm	20.5%	4.7%
Any Dysfunction	44.2%	12.0%

3.2 History of Diagnostic Criteria for FSIAD

Interest in the diagnosis and treatment of low sexual desire in women has been steadily rising since that late 80's, having reached new heights with the support of pharmaceutical interests. The success rates of attempts to find a pharmaceutical cure for women's sexual desire have been highly critiqued (Chivers et al., 2017). Consequently, the field of sexual medicine continues to be divided between two camps: advocates of psychological approaches, based on the DSM-5 (Diagnostic and Statistical Manual of Mental Disorders) and advocates of medicalized approaches based on ICSM (Fourth International Consultation in Sexual Medicine) and ICD (International Classification of Diseases and Statistics) diagnostic criteria, altogether the three most well-known classification systems in sexual medicine.

Sexuality is an integral part of a person's sense of self, identity, self-esteem, and the narrative one forms about attachment and relationships. Addressing such intimate details of a patient's life requires sensitivity, respect and a non-judgmental approach. Inevitably, however, a clinician will be faced with a decision whether the presenting sexual problem justifies a diagnosis or not. It is essential to understand that the diagnosing clinician's theoretical orientation will guide treatment choices and, as a result, will naturally include or exclude certain options.

Consequently, there has been much interest in identifying the best model for female sexual response which would help guide diagnostic efforts. A lot has happened in the field of sexual medicine since the ground-breaking work of Masters and Johnson in the 60's (Masters et al., 1966). They identified human sexual response to consist of four stages,

regardless of the person's gender, to be excitement/arousal, plateau, orgasm and resolution. These four stages were later expanded with the "desire phase" added by Helen Kaplan (Kaplan, 1974). Given the visual illustration of both of these models, they were naturally termed as "linear models" as opposed to the later developed "circular models". While linear models served as the groundbreaking pioneers to get the research on sexual response in motion, they have since been replaced by "circular models" in psychological treatment of female low sexual desire. Circular models are based on motivational theory, emotion theory and systems theory, all contributing from different angles to the model. Circular vs linear models also present a point of divergence between proponents of combined diagnoses of desire and arousal (DSM-5) and separate diagnoses of desire and arousal (ICD and ICSM), namely, Hypoactive Sexual Desire Disorder and Sexual Arousal Disorder. Circular models describe a sexual response starting with an anticipatory phase, characterized by a wish for intimacy based on relational benefits, rather than a spontaneous, hormonally driven need for sexual release (Basson, 2000). Table 3 and Table 4 illustrate current ICD-11 classification and qualifiers for sexual disorders.

Table 3 ICD-11 Sexual Dysfunction

HA00	Hypoactive sexual desire dysfunction
HA01.0	Female sexual arousal dysfunction
HA01.1	Male erectile dysfunction
HA02	Anorgasmia
HA03.0	Male early ejaculation
HA03.1	Male delayed ejaculation MF40.3 Retrograde ejaculation
HA20	Sexual pain-penetration disorder GA12 Dyspareunia

Table 4 ICD 11 Qualifiers

Dx can be qualified as lifelong/aquired, generalized/situational, or unspecified
HA*xx*.0 - lifelong, generalized

HA*xx*.1 - lifelong, situational
HA*xx*.2 - acquired, generalized
HA*xx*.3 - acquired, situational
HA*xx*.Z - unspecified
Dx can also be given etiological codes
HA40.0 - Associated with a medical condition, injury, or the effects of surgery or radiation treatment
HA40.1 - Associated with psychological or behavioral factors, including mental disorders
HA40.2 - Associated with use of psychoactive substance or medication
HA40.3 - Associated with lack of knowledge or experience
HA40.4 - Associated with relationship factors
HA40.5 - Associated with cultural factors
HA40.Y - Other specified aetiological considerations in sexual dysfunctions and sexual pain disorders

In a study of 111 nurse participants, Sand and Fisher tested three different types of sexual response models (Sand & Fisher, 2007). They argued that such testing of sexual response models is necessary since previous definitions of diagnosis were built on sexual response models based on expert opinion and not empirical research. They intended to assess the extent to which women in a community sample embrace two linear models (Master and Johnson, Kaplan) and a circular model (Basson) and whether there may be a difference between women with or without a sexual dysfunction. Women were asked to identify which one of these models best describe their own experience of sexual response. In their research they found that women tend to embrace all three models and not one model is consistently embraced by women. Basson's circular model, which starts out from a position of "sexual neutrality" and is set into motion by appropriate relational, emotional and physiological triggers, appears to be representative of women with a sexual disorder but not of sexually functional women. This was a rather significant and later debated finding, which essentially assumed that Basson's circular model is more representative of a woman with a "more disordered and more dissatisfied" sexual experience and may not

represent normative female sexuality. This latter finding was later confirmed by Giles and McCabe in an anonymous online survey, which resulted in the authors concluding that linear models of sexual response are a more accurate representation for women with normal sexual function. (Giles & McCabe, 2009).

In addition to the above-mentioned studies providing empirical research for the linear and circular sexual response models, several similar models have been formulated and tested in recent years. Giraldi et al included three models in a large sample-sized study of sexually active Danish Adults (Giraldi et al., 2015). They tested the Dual Control Model, The Sexual Tipping Point Model (arguing that it is applicable for women) and Basson's Responsive Sexual Desire Model. In their sample, most women with no sexual distress embraced the Masters and Johnson model and some the Kaplan model. 17% of their sample showed signs of sexual dysfunction and were categorized into a separate group called "manifest sexual dysfunction". Consistent with previous research mentioned above, the majority of women (75%) in the "manifest sexual dysfunction" group embraced the circular Basson model and only a meager minority of 7% endorsed the Masters and Johnson linear model.

Important to note, that this study was highly criticized both in its methodology and the content description of the models presented to study participants (description of the three models were presented in the same order to all participants, the three models are not mutually exclusive, two of the models are motivational models and one of them is not, therefore rendering comparability problematic) (Brotto et al., 2015). Not a surprise that the main critics of Giraldi's test of sexual cycle models were Canadian and British research psychologists, Lori Brotto and Cynthia Graham. Giraldi is a sexual medicine physician, President of the International Society for Sexual Medicine, which promotes hypoactive sexual desire disorder as a separate entity from sexual arousal disorder (McCabe, Sharlip, Atalla, et al., 2016; McCabe, Sharlip, Lewis, et al., 2016). Brotto is a clinical psychologist, a proponent and influential contributor to the DMS-5 changes and the combined diagnosis of FSIAD, has been a strong voice advocating for combining sexual desire and arousal disorders, basing her arguments on responsive sexual desire models, patient reports, treatment outcomes based on largely CNS driven CBT and experiential Mindfulness approaches (L Brotto et al., 2016; Lori Brotto et al., 2016).

DSM-5 criteria were formulated based on circular models while ICD and ICSM diagnoses maintained the linear model perspective. Authors of the DSM-5 diagnostic criteria have criticized linear models as errant in supposing that sexual desire/ excitement must be present for a woman at the onset of the sexual activity. They argued that women engage in sexual activity for a variety of reasons and the presence of sexually competent stimuli is needed in order for the woman to respond favorably. (Rosemary Basson, 2001; Basson, 2010). Basson emphasizes that desire may or may not be present initially and it may only be triggered in response to adequate sexual stimuli and consequent sexual arousal. In her recommendations for the revisions of past DSM-IV-TR diagnostic criteria of hypoactive sexual desire she stated "We recommend that desire be regarded as the result of an incentive (sexually competent stimulus) that activates the sexual system where subjectively perceived desire is one of many components" (Basson, 2010). In the light of this, FSIAD can only be diagnosed if a woman does not experience this responsive sexual interest and arousal even when the appropriate sexual and non-sexual triggers are present.

Given the above mentioned two diagnostics camps, the need for a widely accepted nomenclature (a classification system for assigning names or terms in a scientific discipline) and nosology (provides a scientific classification system for diseases or disorders) became evident around the time when the changes of the current DSM was released in 2013. After much theoretical discussion and somewhat limited empirical research, the new DSM-5 veered away from previous DSM-IV nosology and took the path of combining hypoactive sexual desire disorder with arousal disorder into one diagnosis of Female Sexual Interest / Arousal Disorder.

Table 5 illustrates diagnostic criteria for both the DSM-IV-TR to DSM-5 FSD diagnosis. Note that in DSM-IV-TR, absent or deficient sexual fantasies and desire for sexual activity are the hallmark feature of HSDD, accompanied by distress. The DSM-IV-TR definition of HSDD also requires that the clinician considers "factors that affect sexual functioning, such as age and the context of a person's life". (American Psychiatric Association, 2000). However, it is important to note that the influence of relationship duration on measures of sexual functioning is relatively small. It is likely that sexual functioning is influenced by a multitude of other variables as well (Carvalheira et al., 2010; Witherow et al., 2016).

Table 5 HSSD (DSM-IV-TR) and FSIAD (DSM-5) criteria

DSM-IV-TR	DSM-5
Persistently or recurrent deficient (or absent) sexual fantasies and desire for sexual activity. The judgment of deficiency or absence is made by the clinician, taking into account factors that affect sexual functioning, such as age and context of the person's life. The disturbances cause marked distress and interpersonal difficulty The sexual dysfunction is not better accounted for by another mental or medical disorder (except another sexual dysfunction) and is not due exclusively to the direct physiological effects of a substance (e.g., drug or alcohol abuse, a prescription medication) or a general medical condition.	Absence or significantly reduced sexual interest/arousal for at least 6 months (with at least 3 of the following symptoms): Absent/reduced interest in sexual activity Absent/reduced sexual/erotic thoughts or fantasies No/reduced initiation of sexual activity; unresponsive to partner's attempt to initiate sexual activity Absent/reduced sexual excitement/ pleasure during sexual activity in at least 75% of encounters Absent/reduced sexual interest/arousal in response to any internal or external cues (e.g., written, verbal, visual) Absent/reduced genital or non-genital sensations during sexual activity in at least 75% of sexual encounters

Table 6 Crossover from DSM-IV-TR to DSM-5 FSD diagnosis.

DSM-IV-TR Diagnosis	DSM-5 Diagnosis
Female Hypoactive Desire Disorder	Merged into Female Sexual Interest/ Arousal Disorder
Female Arousal Disorder	
Female Orgasmic Disorder	Unchanged
Dyspareunia	Merged into Genito Pelvic Pain/ Penetration Disorder

Vaginismus	

Table 6 illustrates the crossover from DSM-IV-TR to DSM-5 FSD diagnosis. Clearly, this divergence from previous DSM-IV-TR criteria of FSIAD is based on a significant change in the theoretical understanding of how female sexual desire works. Research on this subject was headed up by groups of researchers mainly in the US, Canada and the Netherlands (R. Basson, 2001; Rosemary Basson, 2001; Kleinplatz & Ménard, 2007; Metz, 2010; Toates, 2009). Table 7 illustrates diagnoses that are missing from the DSM-5.

Table 7 Missing from DSM -5

	Female	Male
Desire/Arousal Disorders	Sexual Aversion Disorder Sexual Anorexia PGAD - Persistent Genital Arousal Disorder	Sexual Aversion Disorder Sexual Anorexia
Orgasmic Disorders	Postcoital Syndrome (Post-orgasmic Illness Syndrome) Hypohedonic Orgasm	Retrograde Ejaculation Anejaculation Anhedonic Ejaculation Anorgasm Post-orgasmic Illness Syndrome Hypohedonic Orgasm
Pain	Painful Orgasm	Male Sexual Pain Painful Orgasm
Hypersexuality/Sexual Addiction		

Many have expressed a concern that this major revision on the diagnostic criteria would possibly inappropriately "raise the bar" for diagnosis, in other words, be too stringent. Women who would meet the criteria for Hypoactive Sexual Disorder but not for Sexual Arousal Disorder are now completely disqualified since they do not meet the combined diagnosis. This assertion was based on significant differences in the wording of the new

DSM-5 definition of low sexual desire, namely the addition of "no or reduced initiation of sexual activity; unresponsive to partner's attempt to initiate sexual activity" and "absent/reduced sexual excitement/pleasure during sexual activity in at least 75% of encounters". Both of these diagnostic criteria reflect the new perspective the authors of DSM-5 criteria placed over the DSM-IV-TR; namely the shift from the previous perspective, which was based solely on the clinician's judgment of deficiency or absence of sexual desire, taking into account factors that affect sexual functioning, such as age and context of the person's life. Basson and colleagues pushed back on this concern by evaluating the number of women with a diagnosis of HSDD who also met criteria for FSIAD. In a sample of 151 women, they found that 73.5% of women with a diagnosis of HSDD also met criteria for FSIAD (O'Loughlin et al., 2018). Derogatis et al. offered further criticism of the newly added diagnostic criteria of "absent or reduced sexual interest or arousal in response to any internal or external sexual or erotic cues (written, verbal, or visual)." (Derogatis et al., 2010). They argued that this criterion is not operationalized for evaluation in clinical practice since there are no validated measures to test for the number of sexual or erotic stimuli that can trigger sexual desire and therefore making it difficult to accurately assess these criteria (DeRogatis, 2011; Derogatis et al., 2011).

The applicability of DSM-5 FSD definitions was also challenged by the ICSM; and the considerations for developing a new nomenclature were discussed, including comorbidities, clinical thresholds, alternative etiologies, and validity (Derogatis et al., 2016). This debate is an ongoing one, with a variety of voices chiming in, with pharmaceuticals on one end of the spectrum all the way to feminist sociologists on the other. The latter calling against pathologizing female sexual desire due to political interests (Driscoll et al., 2017; Thomas & Gurevich, 2021). Some have called for collaboration between the different medical and psychological interest groups in order to find some common ground (Giraldi & Wåhlin-Jacobsen, 2016).

The Fourth ICSM concluded that hypoactive sexual desire dysfunction should be kept as a separate entity from female sexual arousal dysfunction. They recommended adopting some DSM-5 definitions, some DSM-1V-TR definitions, some ICD-10 definitions, and some new definitions developed by the consensus. Their conclusive definition for Hypoactive Desire Dysfunction is "persistent or recurrent deficiency or absence of sexual

or erotic thoughts or fantasies and desire for sexual activity (clinical principle) (Parish, Cottler-Casanova, et al., 2021; Parish, Simon, et al., 2021).

3.3 Diagnostic Considerations and Pharmaceutical Approaches for Female Low Sexual Desire

The debate around the diagnostic criteria of female sexual dysfunctions is not just theoretical, it has a rather practical bent to it, especially when it comes to pharmaceutical trials for low sexual desire. In 2003, Ray Moyhinah, a researcher and health journalist, published an article that posed a preliminary question that preceded the entire debate about low female sexual desire. He questioned if pursuing diagnostic criteria and consequent treatment of female sexual dysfunction is really as medically altruistic as it may appear to be. His rhetorical question "Is a new disorder being identified to meet unmet needs or to build markets for new medications?" implies that the push behind identifying measurable clinical diagnostic criteria is promoted and sponsored by pharmaceutical companies in hopes of creating drugs that can be marketed for large profits. (Moynihan, 2003).

Currently, neither the US Food and Drug Administration (FDA), the government agency in the United States overseeing the regulation of pharmaceutical trials, or the European Medicines Agency have published standards for trials for female sexual dysfunctions. In the United States before a clinician can prescribe a particular pharmaceutical to a patient, the drug would first have to be approved by the FDA. The FDA held a public meeting and scientific workshop in 2014 to hear scientific opinions, including patient accounts. Yet no official FDA statement was released indicating the DSM-5 or any other diagnostic definition to be the basis for drug trials for female sexual desire. This may be due to the fact that the particular division of the FDA that was appointed to oversee drug trials for Hypoactive Sexual Desire Disorder was the Division of Bone, Reproductive, and Urologic Products. This appointment was related to the fact that this above-mentioned division of the FDA oversees other drug trials for male vascular-sexual and urologic (both male and female) conditions such as PDE-5 inhibitors. However, when it comes to female sexual desire the locus of the problem lies in the Central Nervous System (CNS) and its mechanisms are not yet clearly understood.

The FDA has consistently favored patient reports over clinician's evaluation which tends to be more along the lines of DSM-5 viewpoints. They had defended this approach by reiterating their position to protect consumer interests against the "medicalization" of "everyday lifestyle problems" from the financial interests of "Big Pharma" (powerful, for-profit drug companies) (Pyke, 2021).

The question of whose interests should weigh the scale for the FDA, whether consumer interests or the interests of pharmaceutical companies, is somewhat convoluted in the case of Flibanserin. As evidenced by the ongoing lack of consensus in finding a common ground in diagnosis, several interest groups have claimed the right to have the determining voice at the table: Feminist sociologists have called against labeling and medicalizing women's sexuality and a coalition of pharmaceutical companies and women's right non-profits have touted Flibanserin as the answer to gender inequality in sexual health (Segal, 2015) and http://www.EvenTheScore.org.

This latter organization, called Even the Score, applauded the FDA with much fanfare, upon its approval of Flibanserin. Their celebration was backed up by a campaign of 60,000 signatures calling the FDA to "act for women" in approving the first HSDD medical treatment option for women. "Even the Score was established to serve as a voice for American women who believe that it's time for the FDA to level the playing field when it comes to the treatment of hypoactive sexual desire disorder (HSDD)" https://www.prnewswire.com/news-releases/even-the-score-fda-approval-of-first-ever-medical-treatment-option-for-hsdd-is-game-changer-for-women-300130406.html.

Even the Score erroneously claimed that the FDA had approved 20 drugs for sexual dysfunction for men and none for women, thus the name of the organization "Even the Score". While the FDA later rejected these false claims and published the list of medications for male sexual dysfunction; it could not avoid the aftermath of the claims and the advocacy war Even the Score had launched against it (Joffe et al., 2015).

Segal, in her critique of how the FDA has treated the case of Flibanserin, argues that Even the Score put political pressure on the FDA using strong rhetoric. She states: "Even the Score recruited and then ventriloquized, both health professionals and members of the public to pressure the FDA to approve a sex drug for women – claiming that not to do so was evidence of sexism" (Segal, 2018). This pressure on the FDA finally resulted in the

approval of the drug, after it had been rejected twice. Interestingly, the manufacturer of Flibanserin made an extraordinary concession, unheard of for a drug company, to not advertise the drug for 18 months. In addition to this difficulty in marketing the drug, its reputation as an "ineffective" treatment choice led the new owner of Flibanserin, Valeant Pharmaceuticals, to cut its entire sales force responsible for marketing the drug https://www.bizjournals.com/triangle/news/2016/04/05/report-valeant-cutting-addyi-sales-force.html . Thus Addyi, "the female Viagra" was never able to take off successfully. Only 4,000 prescriptions were written for it in the first 4 months of it on the market, which is rather marginal given the size of the vast US drug market (Pevzner & Klein, 2016). It has been consistently criticized as misleading in being called the "female viagra" (Shapiro et al., 2017)

While Addyi has proven to be a failed attempt to revolutionize the treatment of female low sexual desire, to its credit, it attempted to go about sexual desire in a different way than drugs for male dysfunctions: it is a psychiatric drug and not a performance drug, targeting the CNS driven female sex drive. (Pfaus & Jones, 2018)

Determining endpoints in clinical trials is not only necessary but also challenging for disorders as complex as female sexual desire. In conjunction with the "protective role" that the FDA plays to protect consumer interests, it has determined two co-primary endpoints for trials: "sexually satisfying events" (SSE) and "change in desire and arousal". Distress was determined to be a secondary endpoint (https://www.fda.gov/media/130001/download). Again, this is a significant shift towards a patient-report centered approach to diagnosis, however, it has consistently posed a challenge for drug trials. The end point of "sexually satisfying events" was extensively critiqued by sexual medicine specialists since it does not measure the level of desire Dooley (Dooley et al., 2017). Clinicians warned against measuring frequency of sexual events as a means to measure sexual desire for numerous reasons: women engage in sexual events for a plethora of reasons, many of them relational, both positive (such as pleasing or making their spouse "happy") and negative (such as avoiding the spouse's anger or hostility g Sexual Desire Disorders, writes this: "It should be pointed out that there is absolutely no frequency of sexual encounters that defines sexual "normality" and "many factors were found to be associated with differences in intercourse frequency: age, parity, relationship

duration, pregnancy, time, relationship status, fertility intentions, and use of contraception" (Leiblum, 2010).

Their initial recommendation to pharmaceutical sponsors of drug trials was to collect data about primary and secondary endpoints from patient diary reports and brief self-report questionnaires such as the Female Sexual Distress Scale (FSDS) (Pyke, 2021). They have consistently rejected attempts to use validated and widely used clinical measures to assess sexual desire. One of these measures, the Female Sexual Function Index (FSFI), perhaps is the most well-known clinical measure in this subject. They critiqued the FSFI as insufficient and having lack of breadth of the desire domain (frequency and intensity are two separate items) (FDA, 2015). An attempt to overcome the difficulty of conducting trials, based on patient diary reports and only two FDA accepted self-report instruments, has led to the development of a new screening tool: Elements of Desire Questionnaire (EDQ) (Pyke & Clayton, 2018). The EDQ (a self-rate measure) was first used in the trials of bremelanotide (Vyleesi), a melanocortin receptor agonist, which successfully obtained FDA approval in 2019. It was used to explore changes in the experience of desire over the course of the trial, having demonstrated excellent reliability (Revicki et al., 2017) .

Amidst much discussion and as a concession towards sexual medicine professionals advocating for more influence from clinicians in making the diagnosis, the FDA agreed to add some "entry points" before a patient's low sexual desire qualifies for a clinical trial. A group of panelists of sexual medicine clinicians recommended requiring significant sexual distress as an inclusion criterion for clinical trials, using the Female Sexual Distress Scale Revised (FSDS-R). (Fisher et al., 2017). The FDA reiterated its position to exclude women with major depressive disorder and that pre- and postmenopausal women should be evaluated in separate studies (https://www.fda.gov/media/130001/download).

The ongoing scientific and clinical debate about pharmaceutical treatment choices for FSIAD has been extensive and intense at times (O'Loughlin et al., 2018). A detailed overview of the subject is beyond the scope of this paper and a short summary will have to suffice. Advocates of pharmaceutical approaches such as Flibanserin (Addyi) and bremelanotide (Vyleesi) have consistently argued that these methods have indeed yielded clinically significant results and are safe (Clayton & Pyke, 2017).

Flibanserin, a postsynaptic 5-HT1A agonist/5-HT2A antagonist, an anti-depressant SSRI drug, was found to be ineffective to treat depression however it was observed during the clinical trials that Flibanserin contributed to an increase in sexual desire in depressed women with low sexual desire. (Clayton et al., 2018). While sceptics have questioned Flibanserin as a valid treatment agent given its efficacy was rated as "very low"; the mean difference in SSE-s was a 0.49 increase per month vs. placebo and a 0.27-point increase on the FSFI desire domain (Joffe et al., 2015). Regarding bremelanotide: there was no statistically significant difference in SSE-s between the treatment group and placebo (AHC MEDIA, 2020). During the DAISY (acronym for Dose Ascending Study over half a Year) Phase III trials of the drug, the SSE endpoint was the behavioral component of the study, and was reported to be statistical significant at the 100mg dosing. 25 mg and 50 mg dosing did not reach statistical significance. The percentage changes from baseline in SSE were 42.2% in the placebo group, 46.2% in the Flibanserin 25 mg twice daily group, 50.3% in the Flibanserin 50mg twice daily group, and 71.6% in the Flibanserin 100 mg once daily group. The effect size in the 100 mg once daily group was 0.3. While a numerical increase in sexual desire score was observed it was not statistically significant(Thorp et al., 2012). Practically speaking, women who take Flibanserin can expect to have maybe one more "sexually satisfying event" in a month than they otherwise would if they were not taking it.

As an interesting clinical opinion about the clinical use of Flibanserin (Addyi):

"Addyi's purpose is to increase openness and enthusiasm about sexuality. However, it is not a "magic pill," nor can it do it all sexually. The analogy many clients have found motivating is that in rebuilding desire, Addyi contributes 1/3, the woman's renewed sexual voice contributes 1/3, and the couple's new sexual style of intimacy and eroticism contributes the final third. Addyi alone will not cure desire problems. If thought of as the sole antidote to the issue of desire, it runs the risk of making the woman feel she is hopeless and helpless because she is an "Addyi failure." Using the criterion of a dramatic increase in sexual desire due to the medication, the majority of women would be classified as "failures." (McCarthy et al., 2018)

Lastly, it is important to mention testosterone, a hormonal medication, which has also been researched during both clinical drug trials in low sexual desire and observational

studies. Women with sexual dysfunction have decreased sensitivity to sexual cues yet no difference in reaction was shown in sexual arousal in response to PDE5 inhibitors and placebo (Basson, 2002).

However, testosterone may have an effect on preconscious attention for sexual cues in some women: in a group of women with no childhood history of sexual abuse testosterone increased already low levels of preconscious attention for sexual cues. Important to note, that the Van Der Made et al study used sublingual administering of 0.5 mg testosterone which is different than the usual chronic administration of testosterone gels, patches or pills (Van Der Made, Bloemers, Van Ham, et al., 2009; Van Der Made, Bloemers, Yassem, et al., 2009)**.** Another study demonstrated that sublingual testosterone combined with the PDE5 inhibitor vardenafil, induced higher physiological sexual responding in (non-abused) women suffering from low sexual desire (HSDD) by inducing increased allocation of attention to erotic cues (Van Der Made, Bloemers, Van Ham, et al., 2009; Van Der Made, Bloemers, Yassem, et al., 2009)

Currently, no government regulated testosterone product is approved in the US for the treatment of low sexual desire. Two testosterone-based products have undergone FDA trials, one of them "Libigel", a transdermal gel, failed to demonstrate efficacy over placebo while the other product, Intrinsa, a patch, showed sufficient efficacy compared to placebo. Despite its efficacy in clinical trials the FDA declined to approve Intrinsa due to some safety concerns raised during the approval process. Intrinsa was eventually approved by the European Medicines Agency for the use of HSDD with limited indication to women with surgically induced menopause taking concomitant estrogens (Parish, Simon, et al., 2021).

FSIAD, as defined in the DSM-5, has not yet been studied in the pharmacological interventional clinical trials of testosterone. All the controlled, published and randomized clinical trials of testosterone have used the definition of HSDD, a distinct diagnostic entity, as it is presented in the DSM-IV, ICD-10, ICD-11 and ICSM. The divergent paths between medically and psychologically based diagnostic criteria for low sexual desire is apparent here. HSDD is the choice for defining the problem of low sexual desire when it comes to drug trials while FSIAD is the preferred diagnosis in psychological treatment studies (Lori Brotto et al., 2016) .

3.4 Theoretical Models of Sexual Desire Informing Research on Diagnosis and Treatment

As a general starting point in determining whether a patient might be eligible for a sexual dysfunction diagnosis, we need to define what the terminology of sexual dysfunction (SD) stands for and what theoretical model we base this assumption on. In clinically operational terms, sexual dysfunction is typically defined as an impairment in one's desire for sexual gratification or one's ability to achieve gratification. This impairment usually adversely affects the enjoyment of sex by one or both partners. However, sexual dysfunction is not always accompanied by feelings of distress (important to note, distress is a diagnostic criterion for FSIAD).

Previous DSM classifications of sexual disorders characterized this impairment based on a linear model of the sexual response, in which the sexual desire phase precedes the sexual arousal, orgasm and resolution phases. In this model, libido precedes arousal, orgasm and is hypothetically regulated by the mesolimbic dopaminergic reward system (Stahl, 2001). This linear model implies that sexual desire occurs spontaneously and that it is independent of the sexual arousal response (Masters et al., 1966). The wording of the criterion in the DSM-5 as "unresponsive to partner's attempt to initiate sexual activity", signifies a shift in the conceptualization of female sexual desire as "responsive" as opposed to linear. This "responsive" and "circular" understanding was largely based on theoretical models of the female sexual response cycle proposed by Rosemary Basson and Ellen Laan. (Basson, 2008; Laan & Both, 2011).

Basson's argues that women may initiate or respond to sexual interaction for numerous reasons. Given that adequate sexual stimulation and attention to the stimulus are present, sexual arousal will follow. When this genital arousal is accompanied by a positive emotional experience about sex and the relationship in which it takes place, desire is triggered. This desire is labeled as "subjective desire" since it is based on a "conscious appraisal of sexual stimuli and their context in the presence of positive affective and cognitive feedback" (Basson, 2002). Based on this circular, responsive desire model, the complexity of the female sexual response cycle is better reflected by a combined diagnosis of desire and arousal (Basson, 2014)

Along the lines of subjective genital arousal, and contrary to the DSM-5 combined diagnosis of FSIAD, Althof and colleagues advocate for separating subjective arousal, genital arousal and desire, even to the point of suggesting adding a subtype of arousal disorder, namely subjective arousal disorder. Althof defines subjective arousal as "positive mental engagement in response to a sexual stimulus" (Althof et al., 2017). Important to note, that this view is widely accepted and supported by ICSM sexual medicine physicians and illustrates the point of convergence between the DSM-5 and other classification systems such as the ICD-11 and ICSM Meston, a co-author of this opinion paper followed these suggestions up by empirical research and demonstrated that vaginal pulse amplitude and subjective sexual arousal highly predicted each other. When using more current statistical methods, such as multi-level modeling, there is a significant in-between person difference between research subjects. She recommends that researchers would take into consideration the temporal nature of genital and subjective sexual arousal (SSA) at the person level and not condense research data across subjects and time. Meston concludes her study by stating that for some women SSA accompanied by vaginal pulse amplitude is a salient experience while it may not for others. Individual differences vary greatly (Handy et al., 2020; Parish, Simon, et al., 2021.

Justification for this argument of a combined diagnosis in the DSM-5 corresponds with modern incentive theories. These theories describe desire and arousal not as separate phases of the female sexual response cycle but as interplay between the sexual response system; stimuli (incentives) and anticipated rewards, which activate the system. This "incentive motivation" model is based on a sexual system that pushes the individual towards sex, and the situation, while the stimulus pulls the individual in its direction This model pre-supposes an intact sexual response system that can be activated by sexual stimuli but in which sexual stimuli is not intrinsically sexual: motivation emerges by the positive rewards offered by the sexual experience (Both, 2004). The circumstances must be suitable to pursue sexual activity, which assumes an adequate relational setting in which the sexual event can take place.

Incentive motivational theories rest on emotion theory, observational studies on information processing and their application to sexual response. They emphasize conscious and automatic processes in the appraisal of the emotion process (Janssen et al., 2000). When applied to sexual response, women's motivation for sexual experience stems from rewards that are not strictly sexual. These rewards are of more importance than the woman's biological urge. A woman, for intimacy-based reasons (to be emotionally close, to show love and affection, to share physical pleasure for the sake of sharing, to increase a sense of attractiveness and attraction, to increase a sense of commitment and bonding), deliberately finds or receives sexual stimuli that potentially could move her from neutrality to a state of sexual arousal. Consequently, sexual desire does not precede arousal, but it is either a consequent or simultaneous process. Motivational theory has inarguably generated the most research and interest in the recent years.

Further expanding on the wide variety of reasons that motivate women to engage in sexual activity, Cindy Meston and her colleagues have extensively researched motivational factors (Meston & Buss, 2007; Meston et al., 2020) and developed a widely used measurement tool called the YSEX questionnaire. Their research points beyond generalized cultural assumptions (love, procreation, intimacy) for seeking out sexual activity and clearly indicates that a woman may have multiple reasons at a time in choosing to engage or not engage in sex. These reasons encompass a wide spectrum of cognitive, emotional, relational, social and hormonally driven causes giving way to a need for a comprehensive understanding of the patient's situation when making a diagnosis of FSIAD.

3.5 Conclusions

The new DSM-5 standards for Female Sexual Interest and Arousal Disorder (FSIAD) reflect recent theories of female sexual desire such as motivational theory and responsive desire theory. While there is an ongoing debate about the extent to which these theories accurately describe female sexual desire, in general, mental health care providers agree that combining desire and arousal is a logical reflection of patient experience. Combining desire and arousal problems into one disorder also facilitates the development of effective psychological treatment choices for low sexual desire.

While further research is needed to investigate prevalence rates of low sexual desire using FSIAD criteria, an even more pressing need is for developing validated testing instruments using FSIAD diagnostic criteria. Without such tools, efforts to research low sexual desire using DSM-5 diagnostic orientation is not feasible and consequently FSIAD criteria is unlikely to take off to become widely used in research studies.

Even though the debate regarding the diagnostic divergence between the DSM-5 and other diagnostic systems is ongoing, there has been some consensus about the importance of a biopsychosocial approach to assessment and treatment (Kingsberg et al., 2017). Regardless, our viewpoint on diagnosing disorders of female sexual desire is to encourage flexibility and a patient focused approach in clinical practice, which would both require utilizing a biopsychosocial perspective and the use of a multi-specialty team.

Chapter 4: REVIEW OF PSYCHOLOGICAL ASSOCIATIONS FOR FEMALE GENITAL -PELVIC PAIN DYSFUNCTION- WHAT IS REALLY BEING TREATED DURING TREATMENT?

Female Genital -Pelvic Pain Dysfunction (FGPPD) is one of the most common female sexual dysfunctions encountered by sexual medicine clinicians. Prevalence rates of FGPPD have been reported between 1%-27% worldwide (McCabe, Sharlip, Atalla, et al., 2016). Exact prevalence rates are difficult to state given the difference in nomenclature and nosology used by research studies, in addition to a wide variance of age strata, classifications based on lifelong, primary or secondary occurrence, severity and self-reported vs. clinically confirmed diagnoses.

Despite its relatively straightforward presentation clinically, it often poses challenges for providers both in determining its etiology and in selecting an appropriate treatment approach. The path towards symptom resolution can be equally frustrating for the patient suffering with FGPPD. Women often spend years looking for knowledgeable providers and the right treatment. They seek out medical help believing that they would gain clarity about their condition, about its origin and that providers would give treatment alternatives which would permit them to avoid painful sexual activity. When not given an accurate (or any) diagnosis by health care providers, women with FGPPD often feel dismissed,

invalidated, and judged as psychosomatic patients, even victims of gender biases (Braksmajer, 2018).

Similar to other types of chronic pain patients, they have to cross numerous barriers before they get evidenced-based comprehensive care. The path forward for symptom resolution is often characterized by a sense of loss, loneliness, fears of abandonment and failure (Svedhem et al., 2013). The cost, risk and side effects of psychobehavioral treatments for FGPPD are rather insignificant in comparison to medical and pharmacological options; therefore, making services more accessible even for those without adequate resources. In the light of this, it is all the more important to provide a comprehensive review about the effectiveness of such treatments.

Given the ongoing inconsistencies defining a uniform nosological system and nomenclature we have decided to use the definition proposed by the ICSM for female genital pain problems, Female Genital-Pelvic Pain Dysfunction (FGPPD) for this review. The definition of FGPPD is broader than the DSM-5 definition of Genito-Pelvic Pain Disorder and is defined as Persistent or recurrent difficulties with at least one of the following: (i) vaginal penetration during intercourse; (ii) marked vulvovaginal or pelvic pain during genital contact; (iii) marked fear or anxiety about vulvovaginal or pelvic pain in anticipation of, during, or as a result of genital contact; or (iv) marked hypertonicity or overactivity of pelvic floor muscles with or without genital contact (Association, 2013; McCabe, Sharlip, Lewis, et al., 2016; Parish, Cottler-Casanova, et al., 2021; Parish, Simon, et al., 2021)

During their time of suffering many patients are recommended psychological treatment both for symptom management and in hopes of achieving symptom resolution. While the “it’s all in your head” blanket approach towards female pain disorders is now considered outdated there is still a lack of consensus about the role of underlying psychological contributors of FGPPD. This, in part, is due to the difficult nature of devising clinical trials in psychological research on par with the rigor of medical clinical trials, difficulty recruiting patients for research studies in female sexual problems, the frequent use of convenience samples and lack of universally accepted nomenclature for female sexual pain problem (Balon, 2017; Brotto et al., 2017; Pyke & Clayton, 2015).

In addition to the above-mentioned difficulties, there is not one treatment modality that would single-handedly trump other approaches. While CBT is considered a well-researched and widely accepted approach for sexual dysfunctions, including FGPPD, it is difficult to fairly compare the quality and efficacy of CBT techniques across research studies. For example, CBT approaches for sexual disorders often contain a variation of therapy techniques such as appraising the meaning of sexuality, altering dysfunctional beliefs or psychoeducation of the patient, which by nature, cannot be uniformly designed. While psychological treatment modalities, like CBT, can be categorized based on their theoretical origins and guiding principles, a lot is left up to the discernment of the individual clinician; their theoretical training, and their treatment manuals in utilizing a particular method.

While research on psychological treatments for FGPPD is typically carried out in teaching hospitals or medical universities still a large portion of treatment happens in outpatient private practice or at tertiary clinics, sometimes within the context of the patient receiving treatment for another mental health issue or a relational problem. Consequently, efficacy of treatment and treatment modalities used are seldom tracked and much valuable data falls through the cracks. When it comes to psychological treatment outcomes, the patient-clinician relationship also accounts for a large portion of success (Cuijpers et al., 2019). In addition to this, given the scarcity of RCT-s and research studies with an intent-to-treat design, it might be premature to draw a final recommendation for preferred modalities for psychological approaches in the treatment of FGPPD (Melnik et al., 2012).

With these above-mentioned difficulties in the backdrop, the International Consultation on Sexual Medicine recommends a thorough assessment of the patient including attachments style, history of sexual abuse, onset of sexual activity, personality, cognitive schemas, cognitive distractions, infertility concerns, sexual expectations, depression, anxiety, stress, substance use and PTSD. However, when it comes to treating the potentially arising mental health problems there is not one "proven" modality that guarantees a successful outcome for the majority of patients, especially for a dysfunction as complex in its etiology and pathophysiology as FGPPD.

The International Consultation on Sexual Medicine recommends that "Clinicians should attempt to ascertain whether the anxiety and/or depression is a consequence or a cause of

the sexual complaint, and treatment should be administered accordingly." (Parish, Cottler-Casanova, et al., 2021; Parish, Simon, et al., 2021) . It's important to note that such determinations require a trained mental health professional and typically lies beyond the possibilities of the initial patient assessment, which makes treatment choices even more specialized. Consequently, a widely accepted recommendation in the field is to treat FGPPD with a multidisciplinary approach for best patient outcomes, which typically includes urologist, gynecologist, primary care physician, physiotherapists, relationship and sex therapists, and various other specialists and health care providers. While this recommendation proposes an ideal treatment scenario for patients, accessibility of services has been a problem worldwide (Dufour et al., 2019; Hakim, 2006)

4.1. Rationale for this Study

In the light of these challenges surrounding psychological treatments for FGPPD we have assembled the following systematic review of current original studies of experimental and observational studies for contributing psychological factors of FGPPD. There have been several comprehensive meta-analyses and systematic reviews carried out on psychological treatments for female sexual dysfunction (Durna et al., 2020; Flanagan et al., 2015; Frühauf et al., 2013; Houman et al., 2018; Jaderek & Lew-Starowicz, 2019; Kane et al., 2019; Maseroli et al., 2018; Pereira et al., 2013; Tavares et al., 2020; Weinberger et al., 2019).

Therefore, we have decided to compile a systematic review of current (last ten years) of original studies that have reported on underlying psychological contributors to FGPPD. Psychological treatments do not focus on medical etiology but more so on symptomology and impact on functioning. They are designed to work towards symptom resolution by engaging with a variety of substratal contributors. FGPPD is indicated by analogous characteristics regardless of the genital pain type, making it an excellent candidate for psychological and behavioral treatments. Such a systematic review can potentially facilitate clinicians in choosing treatment models focusing on the individual problem set of the patient and any given contributing factors that need to be emphasized during treatment.

Psychological contributors are never one-dimensional and often require the clinician to use a variety of approaches. In an effort to facilitate clinicians' choices of treatment options of empirically supported treatment modalities, we have added three tables (Table 8 Effect

Sizes: Small; Table 9 Effect Sizes Medium; Table 10 Effect Sizes Large) and grouped psychological associations according to their effect sizes on FGPPD.

4.2. Aim

The systematic review was to collect all relevant information regarding psychological associations of Female Genital-Pelvic Pain Dysfunction (FGPPD), including data from observational, experimental, qualitative and phenomenological original studies.

4.3. Methods

This analysis was registered on PROSPERO (number X) and follows the reporting criteria put forth by the PRISMA statement.

Data Sources and Searches

We aimed to identify original research studies regardless of their design that identify and investigate psychological associations of FGPPD by performing an extensive EBSCOHOST, clinicaltrials.gov, Journal of Sexual Medicine, Sexual Medicine Reviews and Cochrane Library search using the following fields: “document type: article; publication type: academic journal; language: English, apply related words, apply equivalent subject, scholarly (peer reviewed) journals, published date: 2010.01.01.-2020.12.31.”.

4.4. Study Selection

Studies included in the systematic review were selected based on (1) study population being FGPPD; (2) testing for psychological associations underlying FGPPD regardless of study design, (3) being an original study and (4) was published in the last ten years. While the majority of these correlational studies utilized a control group, this was not a criterium in the selection process. Primary outcome measures among correlational studies were highly variable (**Hiba! A hivatkozási forrás nem található.**).

4.5. Data Extraction and Quality Assessment

We used the MOOSE Guidelines for Meta-Analyses and Systematic Reviews of Observational Studies in our reporting. The different studies selected tested different yet related correlates of FGPPD therefore effect sizes were not comparable item by item.

However, we included a table with categorizing each association based on the effect sizes as “small”, “medium” and “large”.

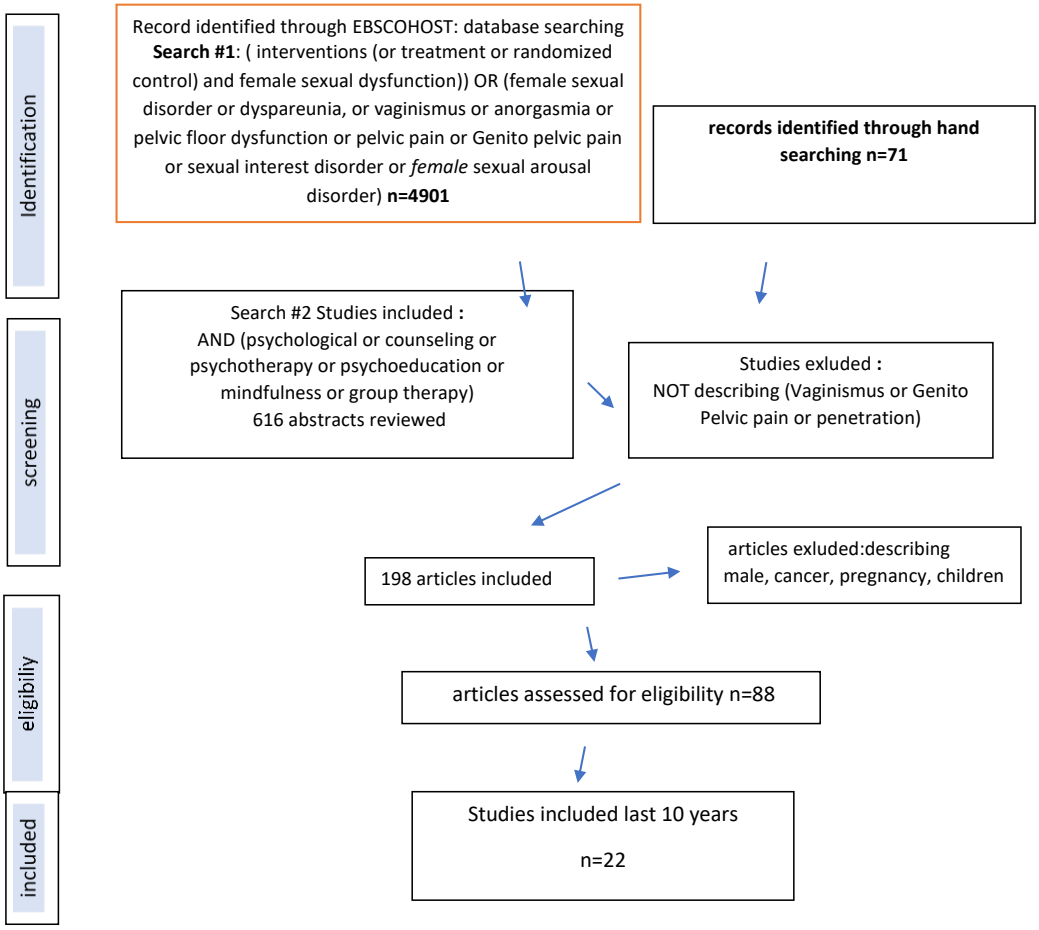


Figure 1 Depicts search criteria following PRISMA criteria.

The following strings were utilized in the literature search: Search #1: “interventions” OR “treatment OR “randomized control” AND female sexual dysfunction OR “female sexual disorder” OR “dyspareunia” OR “vaginismus” OR “anorgasmia” OR “pelvic floor dysfunction” OR “pelvic pain” OR “genito-pelvic pain” OR “sexual interest disorder” OR “female sexual arousal disorder”. This search yielded 4901 records without duplication.

Search #2 utilized the following strings: “interventions” OR “treatment” OR “randomized control” AND “female sexual dysfunction” OR “female sexual disorder” OR “dyspareunia” OR “vaginismus” OR “anorgasmia” OR “pelvic floor dysfunction” OR

“pelvic pain” OR “genito-pelvic pain” OR “sexual interest disorder” OR “female sexual arousal disorder” AND “psychological” OR “counseling” OR “psychotherapy” OR “psychoeducation” OR “mindfulness” OR “group therapy”. Search #2 yielded 616 records plus 71 records identified through hand searching. All 687 records were imported in EndNote X7.

198 records included “vaginismus” OR “genito-pelvic pain”. From this, 110 records were excluded based on irrelevant study population (male, cancer, pregnancy, children). Identification of relevant abstracts, selection of studies, and data extraction from full-text articles were carried out independently by the 2 authors. Articles were assessed for eligibility with the final count of n=88.

After reviewing the remaining 88 full-text articles 22 studies were selected (Figure 1).

4.6. Evidence Synthesis for Psychological Correlates

The study selection process is outlined in Figure 1.

As the result of the study selection process, 22 articles were identified as investigating psychological correlates of FGPPD as the main outcome and also having been published in the last 10 years.

Psychological Associations of Female Genital Pelvic Pain Dysfunction

The reviewed studies encompass a wide range of psychological and psychophysiological associations for FGPPD.

Cognitive associations

Include vaginal penetration cognitions (Goldfinger et al., 2016), attention for pain (Corsini-Munt et al., 2014), negative appraisals of sexual stimuli, automatic and deliberate threat and incentive associations, partner catastrophizing (Huijding et al., 2011), body image (Both et al., 2017), maladaptive beliefs regarding vaginal penetration, vaginal penetration cognitions and metacognitions (Pâquet et al., 2016), avoidance, sexual knowledge (Brauer et al., 2014) , the meaning of penile-vaginal intercourse (Pâquet et al., 2016), self-focused approach and avoidance approach to sexual goals (Bairstow et al., 2018) and concept of sexual self (Dewitte, Borg, et al., 2017; Dewitte, De Schryver, et al., 2017).

Studies on cognitive contributors to sexual pain, predominantly unconsummated marriages, were the first line of research studies for sexual problems. Focusing largely on women with lifelong vaginismus, attention has shifted from the behavioral aspect of vaginal penetration to cognitive and emotional factors that are involved in processing sexual stimuli. More recently, the focus on cognitive associations has been expanded to the effort to explain the role of negative cognitions, threat and incentive associations via observational and experimental studies, looking for a cognitive link to triggers in genital and pelvic pain.

DoĞAn (DoĞAn et al., 2018) and colleagues have investigated vaginal penetration cognitions and sexual function among women with vaginismus and dyspareunia. The vaginismus group, followed by the dyspareunia group, showed the highest cognitive score of loss of control during penetration, negative self-cognitions, catastrophizing, and genital incompatibility cognitions. Interestingly, both groups in their study were positively associated with anorgasmia, similarly to another study carried out in Turkey by KaragÜZel et al, (KaragÜZel et al., 2016) with the odds ratio of a woman with life-long vaginismus (LLV) also having anorgasmia to be OR= 1.27; 95% CI =1.01-1.61 (Laan & Both, 2008). This result could perhaps be related to cultural factors given the geolocation of these studies. In contrast to this finding, and indirectly supporting the significance of geolocation and culture being a moderator in orgasmic function, in a study on Italian patients, Maseroli et al. found that women with vaginismus scored similarly in orgasmic function to case-controls. In their study, pain was the only FSFI domain significantly associated with vaginismus (Maseroli et al., 2017). Further research is needed to compare anorgasmia rates to FGPPD populations in more sexually permissive Western cultures where orgasmic focused, non-penetrative sex is more widespread. (Nimbi et al., 2020) .

In consistence with the biopsychosocial approach, a common model used to conceptualize and guide therapeutic treatment choices in psychology; one study examined the impact of body image associated with sexual response and sexual avoidance and did not find a significant relationship to FGPPD (Engel, 1980; Fava & Sonino, 2017). Instead, Hossieni and colleagues point to the associations of religious and cultural beliefs as strong levers in shaping sexual behaviors in FGPPD (Hosseini et al., 2017). Pazmany (Pazmany, Bergeron, Oudenhove, et al., 2013) and colleagues have arrived at a similar conclusion

regarding sexual self-image and sexual schemas. In an online observational study with women with self-reported dyspareunia, they have concluded that only self-image cognitions about vaginal penetration contributed to pain intensity and not body image cognitions. Body image cognitions contributed to sexual distress. They found that only a small amount of the variance in pain, sexual function, and sexual distress was accounted for by women's sexual self-schema.

Another study carried out in Turkey (KaragÜZel et al., 2016) reported that "Sexual knowledge was significantly restricted and even catastrophic in women with vaginismus compared to the healthy group" even though there was no difference in the "forms of marriage" (traditionally arranged marriage vs. marriage initiated by the partners based on romantic interest) between the vaginismus group and the control group. Clearly, investigating overall sexual function of FGPPD patients in the light of cultural, religious and educational factors is essential in avoiding reducing FGPPD to a biomedical challenge only.

Still along the lines of cognitive and narrative contributors; exploring sexual self-concept, sexual self-efficacy and sexual ideals in women with FGPPD may contribute to better psychological treatments. Can women with FGPPD regulate their perceived levels of pain based on how they "feel about" themselves as sexual partners? Is there perhaps an ongoing discrepancy between their ideal and their actual self-concept and if so, could that explain emotions about their pain (Dewitte, Borg, et al., 2017; Pazmany, Bergeron, Van Oudenhove, et al., 2013). Unexpectedly, pain status did not moderate any of the associations between the sexual self and the outcome variables, expect for sexual frequency. Dewitte et all compared ratings of the explicit ideal self in high and low pain groups. Higher ratings were related to more frequent sex in the low pain group, whereas the high pain group showed no link between the sexual self and sexual frequency. They theorized that while for lower pain and pain-free women, beliefs about the current self and the desired self-esteem to play an important role in fueling engagement in sexual activity, this may not be true for higher-pain women (Bois et al., 2013).

There are aspects of chronic genital pain that is resemblant of other forms of chronic pain. Studies on chronic pain patients with musculoskeletal pain have observed associations between a sense of injustice, avoidance behaviors and mental health (Cherkin

et al., 2016). While Paquet and colleagues (Pâquet et al., 2016) found no association between levels of perceived injustice ("why me?"), pain intensity, and sexual satisfaction; they concluded that both the woman's and her partner's levels of sexual distress were affected by her perceived level of injustice and her narrative around it.

Vaginal penetration cognitions and metacognitive beliefs (maintenance, monitoring, control and appraisal of beliefs) about genito-pelvic pain could be important contributors to successful treatment outcomes. In a cross-sectional study of clinically symptomatic patients and a control group, Teksin Ünal and colleagues investigated how this set of factors leads the woman with FGPPD to focus continuously on the problem itself, in a maladaptive and unhelpful way, during sexual activity (Teksin Ünal et al., 2020). They detected a relationship between penetration cognitions and metacognitions and concluded that maladaptive metacognitions serve a protective aim for women with FGPPD. This protective mechanism ends up contributing to a pattern of negative thinking and to Cognitive Attentional Syndrome (CAS), which is described by various forms of misdirected coping and self-regulatory behaviors. Authors state that their findings support the application of a metacognitive model to FGPPD. It appears that patients with FGPPD aim to regulate their emotions and improve their sexual functioning by employing maladaptive meta- cognitive beliefs; subsequently, however, these thinking patterns and styles encourage recurrent negative thinking.

Interpersonal sexual goals resulting in either approach or avoidance were investigated in a cross-sectional design (limiting causal contributions) by Corsini-Munt et al (Corsini-Munt et al., 2020). The study concluded that when women engage in approach goals for self-focused reasons, instead of partner-focused reasons, they also experience less genital pain. Researchers concluded that when women have higher approach goals, they are likely to pay attention "to positive sexual cues such as pleasurable sensations, rather than the pain itself". It appears that interpersonal sexual goals are linked to pain via establishing attention to sexual cues.

4.7. Affective associations

Include global and deliberate negative affective appraisals, disgust responsivity (DoĞAn et al., 2018; Maseroli et al., 2017)}, fearful preoccupations (20), aversive pain conditioning (Melles et al., 2014), approach and avoidance motivational processes

(Lemieux et al., 2013) , affective temperaments, depression, anxiety(Brom et al., 2015), task-persistent and fear-avoidant pain behaviors (Hosseini et al., 2017). 6 studies utilized experimental designs to assess for the alleged importance of fear and pain conditioning in FGPPD. They assessed for attentional bias, threat and incentive associations by eliciting the characteristic defensive reactions in women suffering from vaginismus via visual analogue scales, single-target implicit association tasks, approach avoidance tasks, physiological measures of subjective arousal and visual search tasks. Melles and colleagues (Melles et al., 2016; Melles et al., 2014) investigated negative affective appraisals and found similar findings to Huijding et al (Huijding et al., 2011) in that women with vaginismus demonstrated more deliberate fear and less global positive affective associations. Patients with depression already seem to have lower pain threshold and pain tolerance than healthy controls but Borg et al (Borg et al., 2010) found that the difficulty of penetration experienced in FGPPD may at least partly be due to a disgust-induced defensive response (Zambito Marsala et al., 2015). They measured the extent to which the target visual stimulus of sexual penetration is associated with two attribute categories (disgusting/nice and threatening/safe). Once FGPPD is treated, anxiety and depressive symptoms decrease as well (Kabakçi & Batur, 2003).

Huijding et al (Huijding et al., 2011) adapted the information processing model to their investigation of penetration cognitions, first in a series of studies utilizing visual processing tests (Melles et al., 2016; Melles et al., 2014). It appears that deliberate appraisals (reflective, controlled, effortful) are most relevant to controllable behaviors. As in the case of women with vaginismus they tended to be more negative and manifest as “disgust responses” (i.e., activity of the levator labii muscles). While automatic appraisals (i.e., reflexive, spontaneous, efficient) are most relevant to reflexive behaviors, they tend to be more positive, both for women with vaginismus and dyspareunia. These observations point in the direction that global negative automatic appraisals and subjective disgust/ threat are involved in defensive responses for women with vaginismus. Consequently, the question whether FGPPD should perhaps be treated as a specific phobia to penetration has been raised (Melles et al., 2016; Melles et al., 2014).

Overall, it appears that fear contributing to coital pain and coital avoidance may be contributed to deficient safety learning, non-differential generalization of fear and higher

expectancy of pain, high anxiety personality traits and not to heightened distraction by pain or sex stimuli (Both et al., 2017). Such reactions to pain has been observed in other chronic pain conditions, namely that self-reported trauma, pain catastrophizing and perceived levels of pain appear to be correlated primarily due to the presence of psychiatric symptoms and manifest most notably in the context of psychological responses to pain (Darnall, 2019; Taub et al., 2020). A study by DeWitte and Kindermans applied regulatory focus (promotion and prevention) approaches to sexual goals and genital pain. Their experimental study found that when women think about their "ideals" that is, their hopes, wishes, and aspirations for themselves as a sexual person, they are less likely to experience potentially painful genital stimuli as painful. Conversely, when they think about sex as "their duty", vaginal pressure is experienced as painful. However, important to note, that the match between individual's predominant trait regulatory focus (state) and task (in the moment) regulatory focus was the strongest predictor of pain, "which suggests that merely activating a reward seeking vs harm avoidance mindset is not sufficient to determine how women appraise vaginal sensations by the VPI (vaginal pressure inducer), process sexual information, and respond to sexual stimuli" (Dewitte & Kindermans, 2021). This study was not included in Table 5 HSSD (DSM-IV-TR) and FSIAD (DSM-5) criteria5 since it was carried out on a non-symptomatic convenience sample.

A retrospective study by Maseroli et al showed significantly higher histrionic-hysterical symptoms and traits in women with vaginismus compared with subjects with other sexual complaints. Important to note though that this study failed to find an association between vaginismus and somaticized anxiety, which is, although rarely, the case for other forms of chronic pain patients. Although the rate of pain-related anxiety in women in general is not known, other personality traits such as neuroticism has been shown to be independently associated with greater pain catastrophizing and pain-related anxiety (Kadimpati et al., 2015). The Maseroli et al study evaluated the specific contribution of each psychological parameter significantly associated with vaginismus in more depth, via a multiple logistic regression analysis, and after adjusting for age, subjects with vaginismus showed an increased risk of higher pain and sexual distress and a higher MHQ-H score (histrionic-hysterical traits) (Maseroli et al., 2017). Likewise, on a clinically confirmed (both gynecological and psychological exam), controlled sample of women with vaginismus,

Ciocca et al. found alexithymic traits as in "a considerable number of women with vaginismus react in such a way as to suggest that their capacity for emotional processing is partly or completely absent" (Ciocca et al., 2013). This type of cognitive-emotional impairment, along with impaired emotional regulation, has been reported on psychosomatic disorders as well (Preis et al., 2017).

In addition to this, number of attempted and failed treatments may play a role in the fear and anxiety of FGPPD patients (Govind et al., 2020). Govind et al. found that women who arrived for consultation after failed treatments showed higher rates of pain-related anxiety and depression (Govind et al., 2020). Turan et al (Turan et al., 2020) confirmed previous findings that women with life-long vaginismus (LLV) tend to have cyclothymic or anxious temperament, harm-avoidance behaviors, perfectionistic and irritable personality traits, which reportedly has a negative effect on their sexual function (Brotto et al., 2003). Sexual depression, however, is affected by how one perceives herself as a sexual partner (Dewitte, Borg, et al., 2017; Dewitte, De Schryver, et al., 2017).

Anxiety, depression and adjustment disorders are frequent presenting symptoms in primary care and OB-GYN offices anyway; thus the collaboration between patient and provider in separating somatic complaints from medical illness is essential in finding the appropriate diagnosis and effective treatment options (Croicu et al., 2014). Therapist-aided exposure treatments have been used in the treatment of pain related fear anxiety in patients with FGPPD (Goldfinger et al., 2016; Ter Kuile et al., 2015).

Looking deeper into the pathogenesis of female genital pain conditions, it appears that similar emotional and cognitive mechanisms could be underlying the pain conditioning process as in other pain conditions (Basson, 2012). Pain avoidance tendencies, pain catastrophizing, lower pain threshold, higher magnitude estimation of pain, combined with a higher trait anxiety, increased somatization and depression are common psychological factors for both musculoskeletal chronic pain and sexual pain (Basson, 2012; Granot & Lavee, 2005). Farina et al. observed a strong association between somatoform disorders and FSD, asserting that some forms of FSD could be regarded as somatoform dissociative disorders (Farina et al., 2011).

This proposed connection between chronic pain and FGPPD is significant when it comes to psychological treatment since several new modalities have been developed in the

last decade for the treatment of chronic pain. While the connection between pain and affective responses is not linear, if indeed sexual pain bears such similarities to other types of chronic pain, the potential of borrowing psychological approaches from the world of chronic pain treatments could be promising for FGPPD (Reed et al., 2012). For example, as a typical "chicken or the egg" case, depression appears to moderate increase in genital pain over time as well as women who experience chronic genital pain also report higher depression levels (Burri et al., 2014). Vulvodynia is more likely among women with antecedent mood disorders but so is chronic back pain and hip pain, in other words, non-sexual types of chronic pain (Khandker et al., 2011; Schwarze et al., 2019).

Treating such patients from a multifactorial treatment perspective, similarly to patients with other non-sexual pain conditions, appears to be on a promising track. CBT has proven to be effective in ameliorating expectations about pain outcomes, while Mindfulness Self Compassion has been used to decrease clinical pain intensity among chronic pain patients (Berry et al., 2020; Derogatis et al., 2010; Desrochers et al., 2010).

As a form of anecdotal evidence, first author of this article has successful used Mindfulness Self Compassion in an outpatient clinical setting to reduce pain catastrophizing and de-escalate anxiety-related physiological arousal in FGPPD patients. Also, among Mindfulness-based therapies, Brotto et al. has found that women in shorter relationships improved more with Mindfulness-Based Cognitive Therapy (MBCT), which seems to have higher treatment credibility among younger women, whereas women in longer relationships improved more on sexual function with CBT (Brotto et al., 2020). Whenever possible, clinicians should group-based therapy treatments, which have been proven to be efficacious especially for pain disorders (Houman et al., 2018).

To test whether learned associations between pain and sex negatively affect sexual response, and whether this particular response may be worse for women with dyspareunia, Both et al. (Both et al., 2017) conducted a differential conditioning experiment. They paired the conditioned stimulus (CS) with a painful unconditional stimulus (UC) and with a stimulus not paired with pain. Participants' subjective affect and subjective sexual arousal were rated both during the preconditioning and extinction phases. Similar to other non-genital pain conditions, women with dyspareunia expected more strongly to receive the

pain stimulus at presentation of the "safe/ not paired with pain" stimulus than healthy controls.

Another important clinical implication on conditioned pain responses is the possible resistance to the extinction of aversive conditioned sexual responses for women with FGPPD (Brom et al., 2015). This is a rather concerning problem and could possibly underly the fact that most patients with FGPPD average years of suffering before symptoms relief (reference needed). Brom et al. found that aversive classical conditioning did not extinguish during the extinction phase of their study. This is significant since the goal of clinical therapies such as "exposure and response therapy" and "desensitization" is to extinguish the conditioned response. Are these results generalizable to sexual pain? Or are these seemingly discouraging results perhaps due to the CS being erotic (biologically salient) and consequently inducing an instinctual approach response? Is it possible that outside the experimental lab setting, in "real life", the relational dynamics between the woman and her partner may alter the reward value of the stimulus? While none of the articles we have reviewed provides answers to these questions directly, we can note that clinical treatments are tending in the direction of reducing pain perception, pain catastrophizing and anxiety associated with pain instead of attempting to extinguish classical aversive conditioning.

4.8. Relational and social associations

Include partner responses to pain; perceived injustice and pain (Pâquet et al., 2016), the impact and meaning of the inability to have penile-vaginal intercourse on the relationship (Bairstow et al., 2018), childhood maltreatment and its impact on pain and the relationship, abuse and relational adjustment (Corsini-Munt et al., 2017),

Similarly, to the impact of pain catastrophizing cognitions on individual pain intensity, Lemieux et al. (Lemieux et al., 2013) found decreased pain intensity in women whose partners demonstrated less catastrophizing of the genital pain. Additionally, partners' perception of the woman's degree of self-efficacy in managing her pain was associated with perceived pain levels. Other studies have shown similar dyadic moderators such as the level of congruence between actual and estimated ratings of pain and sexual arousal seems to depend on how relationally satisfied men and women are in their relationship and how validated and supported women feel by their male partner (Dewitte & Schepers, 2019).

Such results highlight the complexity of partnered sexual relationships and provides justification for treating FGPPD within the relationship system instead of an isolated biomedical phenomenon.

In the same vein, Turan et al. investigated depression and anxiety levels, sexual dysfunctions and affective temperament characteristics of both women with life-long vaginismus (LLV) and their male partners. According to their findings, women with LLV tend to be in a relationship with men who have more anxiety or depression than controls, which interestingly ends up having a positive effect on the woman's sexual function. This could perhaps be through the moderating effects of avoidance behaviors and the male partner not "pushing for sex". Maseroli et al. (Maseroli et al., 2017) also investigated conflicts within the couple and the perceived sexual dysfunction of the male partner. They did not find specific correlations; however, it is important to note, that they had only looked at the woman's perception of her partner's sexuality via a cross-sectional method and did not directly enlist male partners in the research. Conversely, in a controlled study, Pazmany et al. (Pazmany et al., 2014) compared dyadic sexual communication, dyadic adjustment, psychological adjustment, and sexual well-being of women with self-reported dyspareunia and their male partners. Their results showed that women with dyspareunia were equal to controls in dyadic adjustment however had poorer sexual communication than healthy controls but better sexual communication than their male partners (Pazmany et al., 2014).

Brauer et al. investigated sexual pain behaviors, which can be either task-persistent (continuing with the behavior despite the presence of pain) or task-avoidant (avoiding the behavior out of fear of pain). Both forms of pain behaviors can aggravate or maintain pain symptoms and consequently have an effect on the woman's relationship with her male partner. Task-persistent behaviors such as "duty sex" and mate-guarding motives in engaging sex was higher among women with dyspareunia than controls, revealing less sexual efficacy and sexual autonomy. Task-avoidant behaviors also include avoiding non-penetrative sexual activities out of fear of penetration and having 'boundaries crossed' "Qualitative data reveal that a woman with dyspareunia may avoid, for fear of penetration, non-penetrative sexual activities because they feel that once intimacy has started, or once their partner has an erection, they cannot say "no" to penetration" (Brauer et al., 2014).

FGPPD disorder has historically been considered as a psychogenic disorder. Possible developmental or sexual abuse history is often considered by clinicians as the etiology of FGPPD. Several studies investigated whether such associations are indeed prevalent in this population. Neither Maseroli et al (Maseroli et al., 2017) nor KaragÜZel (KaragÜZel et al., 2016) found a higher prevalence of sexual abuse among women with vaginismus, although important to note that the former study was a retrospective, cross-sectional design and the latter utilized a small sample size, which may impact generalizability. While not directly examining sexual abuse history as a possible etiological factor, Corsini-Munt et al. (Corsini-Munt et al., 2017) considered the associations between childhood maltreatment, dyadic functioning, sexual function and pain in a clinically confirmed sample of women with PVD. Women's childhood maltreatment was only associated with affective pain (the unpleasantness of pain and the emotional valence of pain) during intercourse and not sensory pain. Other studies in the past had explored the impact of childhood maltreatment on FGPPD, vulvodynia and dyspareunia in specific, with mixed outcomes. Some found a correlation between having a history of severe childhood maltreatment, genital pain and negative psychological outcomes (e.g., living in fear of abuse, not receiving social support) and others have not (Corsini-Munt et al., 2017; Edwards et al., 1997; Khandker et al., 2014). Some have expanded on previous research on developmental trauma and somatization and reported that women with dyspareunia present with similar characteristics as women with sexual abuse history. While fearful attachment fully mediated the link between childhood trauma and somatization, childhood sexual abuse was not found to be more prevalent among women with FGPPD than controls. Insecure attachment style, expressed by higher levels of anxiety and avoidance, as well as a high level of somatization were more prevalent among women survivors of sexual abuse without FGPPD than women with FGPPD and no sexual abuse history (Farina et al., 2011; Waldinger & Schweitzer, 2006)

Important to note that no causal attribution had been found between childhood maltreatment and FGPPD. The seeming contradiction in results between the above-mentioned studies could be attributed to the following: 1. studies using similar yet distinct FGPPD populations (vaginismus or unconsummated marriage, vulvodynia and PVD) 2. different study objectives: such as investigating the prevalence of childhood sexual abuse

in a small sample of clinically confirmed vaginismus patients (KaragÜZel et al., 2016) vs investigating the psychological correlations of childhood maltreatment in an epidemiological sample of patients who had self-reported vulvodynia and also had a history of childhood maltreatment 3. Difference in instruments used to assess childhood maltreatment and sexual abuse. 4. No distinction drawn between sensory and affective pain. 5. Women with sexual abuse history tend to exhibit insecure attachment styles and higher levels of somatization and avoidance, which could manifest in affective pain (Harlow et al., 2017).

Using a phenomenological approach, Bairstow et al. used a series of interviews with women with FGPPD to explore their lived experience of FGPPD; the meaning and the impact of penile-vaginal intercourse (PVI) on their lives. 3 themes emerged from this study: shame and embarrassment, invisibility and centrality of PVI. Overall, participants described the inability to have PVI as "central to their sexual experience" and linking it to increased intimacy due to the mutual aspect of it (Bairstow et al., 2018).

Relational and psychosocial characteristics of FGPPD have been studied from multiple angles. Attachment style, partner characteristics, sexual assertiveness, relational intimacy and communication have all got attention in order to facilitate women's dyadic adjustment and increase sexual satisfaction despite their pain (Desrosiers et al., 2008; Leclerc et al., 2015; Lemieux et al., 2013). At large, conclusive evidence is pointing in the direction that psychosexual characteristics, such as sexual assertiveness and attachment style in romantic relationships, do not directly affect pain intensity, only sexual satisfaction and sexual function (Cohen & Belsky, 2008)and include sexual arousal, genital and subjective responses (Borg et al., 2010).

4.9. Psychophysiological associations

A several studies have investigated a range of negative and positive psychophysiological responses among women with GPPD (Borg et al., 2010; Cherner & Reissing, 2013; Dewitte, Borg, et al., 2017; Dewitte, De Schryver, et al., 2017; Huijding et al., 2011). Some studies have used visual stimuli depicting vaginal penetration only, which limits generalizability to other sexual activities for women with GPPD, whom already have difficulties with penetration. While limitations in achieving generalizability to "real life" continue to exist, two studies utilized a variety of stimuli: neutral, no penetration and

vaginal penetration (Cherner & Reissing, 2013; Dewitte, De Schryver, et al., 2017). Cherner et al. (Cherner & Reissing, 2013) investigated genital responses and mental arousal in response to erotic visual stimuli in a group of women with lifelong vaginismus compared with women with lifelong dyspareunia. Vulvar temperature was recorded using an infrared camera and subsequently participants completed a measure of subjective responses after viewing each film. Their findings supported Huijding et al.'s previous findings on women with vaginismus having the highest levels of disgust, worry, anxiety and threat responses, regardless whether penetration was depicted or not. Despite greater anxiety and feelings of worry, threat, and disgust, both women with vaginismus and dyspareunia exhibited similar levels of genital arousal to healthy controls showing that, at least in the laboratory setting, genital arousal is not impaired. These results also demonstrate the presence of contrasting psychophysiological responses in women with FGPPD such as pain, accompanied by fear of pain, pelvic floor dysfunction, behavioral avoidance, negative affect (disgust, worry, anxiety) and the presence of genital arousal, in some cases even lack of mental arousal paired with genital arousal (Reissing et al., 2004). Interestingly, video clips depicting non-penetrative stimuli elicited a greater level of anxiety in women with FGPPD, possibly pointing to anticipatory anxiety, which is consistent with Pazmany et al.'s (Pazmany, Bergeron, Van Oudenhove, et al., 2013). finding of fear of penetration being the main modulator of pain intensity.

4.10. Relevance for Clinical Practice (Systematic Review)

Altogether, we can state with confidence that FGPPD has strong psychological correlations and addressing them via psychotherapeutic methods is an integral part of successful treatment outcomes. Not one treatment modality stands out as an overarching "one shot, that's all" method; therefore, combined therapeutic approaches, focusing on individual patient characteristics, seem to offer the most promising results. Based on our meta-analysis and systematic review we recommend that clinicians select treatment modalities to address a variety of psychological associations of FGPPD during treatment and, when feasible, in a relationship context. For summary tables see Appendix: Relevance for Clinical Practice (Systematic Review)

Table 8 Effect Sizes: Small

SMALL							
Target Sex: ηp^2 =0.16 V.: d= 0.19 D.: d= 0.29)	Distractor Pain ηp^2 = 0.06 D.: d= 0.31)	Effect of exposure treatment on automatic and deliberate threat associations $\eta p^2 < 0.01$		Painfulness D.: d=0.32	Fear D.: d=-0.04	Body image Unconsummated Women (UCM) d=-0.25
Depressive d= -0.031	Noncommunication LLV d=0.3	TEMPS-A Scores Depressive d=0	Free-floating anxiety d= 0.173	Phobic Anxiety d= 0.038	OCD d= 0.060	VTotal MHQ-S d=0.233
GRSSS Communication d= 0.13	GRSSS Sensuality d= 0.24	Pain related global Self Esteem d= -0.15	self-image cognitions about vaginal penetration (b = 0.25, *P* = 0.005)	Dyadic adjustment (DAS)= not significantly different	Pair-wise comparison of deliberate negative appraisal in women dyspareunia and controls d=0.030	

Table 9 Effect Sizes Medium

MEDIUM						
Genital Incompatibility cognitions V.: d=0.41;	Genital Incompatibility cognitions V.: d=0.41; D.: 0.30	Target pain $\eta p^2 = 0.04$; V. d= 0.29; D.: d= 0.45	Distractor Pain $\eta p^2 = 0.06$; vaginismus d= 0.50	t positive stimulus: penetration: d= 0.49 and positive sex: d= 0.53	Less positive affect to penetration stimuli than to non-penetration stimuli: d= -0.57	Effect of exposure treatment on deliberate fear ratings with regard to vaginal penetration stimuli: d= 0.51
GRSSS Frequency d= 0.42	Partner catastrophizing and perceptions of women's self-efficacy explained 31.1% of the variance in the pain intensity of women with entry dyspareunia, with 7.5% accounted for by partner variables		Dissatisfication LLV d=0.57	Nonsexuality LLV 0.45	Anorgasmia LLV d= 0.45	TEMPS-A Scores Hyperthymic d=0.6
Woman with PVD: lower sexual funct. r=-0.32; higher anxiety r=0.30	Higher approach less painful sex and higher sexual satis. r=-0.25 and r=0.22	Higher avoidance goals more pain r=0.19	Higher self-focused avoidance greater depressive symptoms r=0.40	Pain related sexual self Esteem d= -0.50	Dyadic sexual communication (DSC) $\eta p^2 = 0.08$	Depression (BDI) $\eta p^2 = 0.05$

Table 10 Effect Sizes Large

LARGE							
Loss of control during penetration V.: d=2.08; D.:d= 1.79	Pain Catastrophizing Vag.: d=1.29; Dysp.d=: 1.4	Self-image Vag: d=0.89; D.: d=0.98	Coitus attempts ηp^2 = 0.2	Arousal (FSFI) ηp^2 = 0.6:	Pair-wise comparison of deliberate negative appraisal in women with vaginismus vs controls ηp^2 = 0.18; d=0.712		Vaginal penetration stimuli and fear associations: V.:d= 1.08
penetration stimuli d= -1.25 and non-penetration stimuli d= -0.82	Effect of exposure therapy on global affect evaluation of penetration stimuli: d= 0.63		Back Anxiety Inventory (BAI) V.:d=1.3	Back Depression Inventory (BDI) V.: d=1.5	TEMPS-A Scores Cyclothymic d= 0.9	TEMPS-A Scores Anxious d=1.5	TEMPS-A Scores Irritable d=1.8
sexual antimony Vag.:d= -0.9; Dysp.: d=-0.98	Control cognitions Dysp.: d=-1.36 Vag.: d= -2.3	Catastrophic and pain Vag.: d=4.8; Dysp..:d=2.54	Self-image cogn. Dysp.: d= 1.35 Vag.: d= 2.1	Positive cogn. Dysp.: d= -1.64; Vag.: d=-1.4	Genital incompat. Dysp.: d=0.79; Vag.: d= 1.6	Histrionic V.: d=0.633	Vaginismus LLV d= 1.5
Back Anxiety Inventory (BDI) V.: d= 3.62	Back Depression Inventory (BDI) d= 1.35	GRISS total score d= 1.62	GRSSS Satisfac. d= 1.05	GRSSS Avoidance d= 1.06	GRSSS Vaginismus d=2.90	Subjective disgust V.: d=0.53	Subjective threat V.: d=0.79

Chapter 5: CLINICAL STUDIES ON MARITAL INTIMACY, FSD AND SEXUAL FREQUENCY

The following chapters are excerpts from the following two publications: Witherow et al., 2016; Witherow et al., 2017. These research studies were carried out in three different outpatient mental health clinics. First author (Witherow) is licensed by the state of Mississippi in the USA as a marriage and family therapist, licensed professional counselor and a certified sex therapist. Second author (Chandraiah) is a licensed medical doctor and a board certified psychiatrist in the state of Mississippi, USA. The rest of the authors based on the USA are licensed psychologists. One author is a biostatistician.

Although the causal relationship between marital intimacy and female sexual dysfunction has been investigated in the past there is still a dearth of research evidence supporting the findings, especially in a format applicable to clinical practice (Balon & Wise, 2011; Ferreira et al., 2012; Rosen & Bachmann, 2008; Sims & Meana, 2010). Up to date author of this dissertation is not aware of studies on the correlations of sexual dysfunction and sexual frequency within clinical populations.

In clinical practice it is often relational conflict surrounding sexual desire and frequency that prompts couples to seek treatment. Willoughby, Farero & Busby (Willoughby et al., 2014), report that gender differences do exist in how sexual frequency influences individual perceptions of the relationship. They have found that husbands are more likely to report larger discrepancies between desired and actual sexual frequency than their wives but women's sexual satisfaction may not be negatively impacted by lower sexual frequency (Willoughby et al., 2014).

Even though there is rarely a simple cure for the issue of sexual frequency within a marriage, understanding the correlation between relational intimacy and sexual frequency will also help guide clinical practice in treatment choices for couples that report distress about sexual frequency in their relationship. Social exchange theory and attachment theory view relational intimacy as a potential protective mechanism against the negative effects imposed by sexual problems on relationships under some circumstances (Stephenson, 2010). Indirect support for relational intimacy's role in sexual functioning comes from evidence that anxious-ambivalent and avoidant-dismissive attachment styles negatively

correlate with sexual functioning and behaviors (Ciocca et al., 2015; Granot et al., 2010; Stefanou & McCabe, 2012). In addition, among recently married heterosexual couples, sexual frequency and sexual satisfaction mediate the relationship between the wife's perceived sexual attractiveness and the couple's marital satisfaction (Kline, 2015). Because women who experience more negative perceptions of self-attractiveness also report worse romantic intimacy (Shrout & Bolger, 2002), intimacy likely impacts these sexual outcomes. Evidence that relational intimacy underlies sexual outcomes in FSD would provide strong support for interventions and conceptual models that promote intimacy and satisfaction as a means to promote women's sexual health.

In cross-sectional samples, relational intimacy has been observed to protectively moderate the negative influence of lower sexual functioning on life satisfaction (Wen & Fan, 2015) and predict sexual frequency independent of age and marital duration (Fritz & MacKinnon, 2007). Previous longitudinal investigations have also shown that frequency of sex and marital satisfaction are indirectly linked via sexual satisfaction. Understanding the factors hypothesized to influence outcomes such as sexual frequency and satisfaction have potential importance as these two factors are positively associated with relationship stability and union dissolution, though this association is somewhat stronger among cohabitating than married couples (Willoughby et al., 2014).

Given the minimal efficacy of available medication therapies for FSD (Bois et al., 2013; Witherow et al., 2016; Yabiku & Gager, 2009), it is important to further investigate the role played by interpersonal dimensions in impaired sexual functioning, such as relational intimacy, to inform balanced approaches to integrated care (Blair et al., 2015; Isidori et al., 2010). Overall, we can say that a couple's sexual interactions cannot be compartmentalized, and they must be interpreted in the light of their overall relationship. Social exchange theory holds that if the costs of a given interaction, for example having sex, begin to outweigh the rewards, an individual will not engage in the interaction. (Fallis et al., 2016; Yabiku & Gager, 2009). Our studies are unique in that they use a clinical sample of married women, much like what a clinician may encounter in his or her office-based practice, and clinical measures that are easy-to-use for clinicians in order to make an assessment.

Most studies on relationships satisfaction and sexual functioning have focused on the relationship of general relationship satisfaction and sexual satisfaction using large-scale studies among the general population through convenience samples within different social networks or subpopulations such as college students or large-scale internet surveys (Costa & Brody, 2007; Philippsohn & Hartmann, 2009; Stephenson & Meston, 2012). Another trend is the use of theories based on clinical practice of individual clinicians lacking the strong evidence-based approaches of larger statistical studies. Ferreira et al. note that current theories about the correlation of intimacy and sexual desire are based on clinical speculations and not on empirical studies (Ferreira et al., 2012). Although all of these different approaches have contributed to sexuality research the field still seems to lack sufficient amount of research studies based on the clinical population, sometimes as a result of the easy use of convenience samples. Author of this dissertation believes that the fields of sexual medicine and psychology could greatly benefit from more research studies carried out on clinical populations in order to aid the work of clinicians and to substantiate treatment models proposed by individual clinicians. Brotto et al. also point out that the evidence for the efficacy of psychological approaches is based on limited studies and that there is an urgent need for more data on assessment, etiology and treatment of female sexual dysfunction (Brotto et al., 2010).

5.1 Specific aims of study I.

The current study investigates the relationship between perceived levels of marital intimacy, sexual dysfunction and sexual frequency. We explored relational intimacy as a predictor of sexual frequency in married relationships that is if a woman feels closer to her husband will she have sex more frequently? We also investigated relational intimacy as a mediator between sexual frequency, as a count variable, and sexual functioning.

5.2 Research Questions, Hypothesis and Predictions

How do relational intimacy and the FSFI-6 domains serve as individual predictors of sexual frequency in married relationships?

How does relational intimacy serve as predictor of sexual frequency in married relationships after adjusting for the FSFI-6 domains?

Does marital intimacy mediate the relationship between sexual functioning and sexual frequency? And if so, how does it do that?

We hypothesize that women who feel closer to their husband will have sex more frequently than those who have lower levels of intimacy. We also hypothesize that relational intimacy serves as predictor of sexual frequency in the presence of sexual functioning (FSFI-6 variables) in married relationships. Further, we believe that relational intimacy will have a mediating factor on sexual frequency in the presence of sexual functioning.

5.3 Specific aims of study II.

The aim of the Study II was to determine whether marital intimacy mediates the relationships between sexual functioning and several behavioral and emotional sexual outcomes (sexual frequency, sexual satisfaction and sexual distress) in a treatment-seeking heterosexual sample of married women.

It was hypothesized that female patients with impaired sexual functioning, compared to patients with normal sexual functioning, would differ in sexual satisfaction and sexual distress (feelings of anxiety, worry, and frustration about one's sexual functioning), and that women's perceived levels of marital intimacy would mediate this association. This hypothesis was based partially on a previous study showing that women who reported greater intimacy levels also reported less impact of physical pain on their sexual relationship.

A second hypothesis predicted that intimacy mediates the relationship between impaired sexual functioning and sexual (coital) frequency. Clinically, this hypothesis would be illustrated by patients with impaired sexual functioning who report engaging in more sex when they feel close to their partner, but that this relationship is stronger for those with higher relational intimacy levels.

Finally, whether age or marital duration alters the hypothesized mediation relationships was tested given evidence that age may moderate the association between sexual functioning and sexual distress in women with impaired sexual functioning

5.4 Research Questions, Hypothesis and Predictions

Given that impaired sexual function is a common presenting problem and that past research has identified a number of contextual and relational factors associated with it we have set out to investigate how intimacy acts on the relationship of coital frequency and impaired sexual function.

While sexual frequency shows a decline over time in permanent relationships intimacy has been shown to increase with relationship duration (Hatfield & Rapson, 1993). How do these two processes play out in long-term committed relationships where female impaired sexual function is present?

Does marital intimacy mediate the relationship between impaired sexual function and sexual satisfaction and sexual distress, respectively?

Intimacy has shown to have a protective function against distress in such relationships; does it also moderate the association between impaired sexual function and frequency (Stefanou & McCabe, 2012)?

There are two separate lines of clinical systems-based theories regarding the association of intimacy, sexual function and frequency but only limited empirical evidence to support them. Both of these lines of theories consider both relational dynamics and individual differences but describe seemingly different dyadic processes as explanations for the outcome of sexual frequency.

One line of theory suggests that intimacy in long-term relationships has a detrimental effect on sexual desire for a partner (due to emotional undifferentiation and familiarity/ habituation) and it dampens erotic interest and sexual frequency (Schnarch, 2000; Schnarch, 1997; Stephenson et al., 2013). Another distinct line of theories is based on intimacy-founded sexual motivation and places sexual function in the context of attachment theory positing links between attachment strategies and sexual engagement and thus proposing a significant impact on how we approach and engage a partner in sex. Attachment theorists and researchers identify secure attachment as a safe haven in the face of negative consequences and distress imposed by sexual problems (Johnson & Zuccarini, 2010).

Intimacy based models state that for women the context in which the sexual encounter happens is more important than the stimuli (Gehring, 2003).

Although the current study did not directly test either of the above-mentioned theoretical frameworks the concept of intimacy possibly acting as both a motivation for sexual engagement and a protector against the negative consequences of impaired sexual function in long-term romantic relationships is of focus here. The current study investigates the moderating role of a woman's perception of the level of intimacy in her relationship on sexual frequency in the presence of impaired sexual function. We measured some previously proposed components of intimacy such as feelings of closeness, incorporation of a relationship partner's identity with one's self-concept and measuring one's satisfaction with the negotiated levels of closeness.

Chapter 6: MATERIALS AND METHODS

Both studies **STUDY I** and **STUDY II** used the same materials and measurements below:

6.1. Sexual Satisfaction and Distress.

The Sexual Satisfaction Scale for Women (SSS-W) (see Appendix SSS-W) is made up of 30 items assessing five unique domains of sexual satisfaction and has demonstrated high reliability and validity (Meston & Trapnell, 2005). The Sexual Satisfaction Scale for Women includes subscales assessing overall satisfaction with one's sex life as well as personal and relational sexual distress regarding sexual problems in a relationship. The present study used all five subscales of the SSS-W. Each subscale consists of six items that are reverse coded and summed so that higher scores indicate less distress (higher well-being). Scores for each subscale range from 6 (***very high distress***) to 30 (***no distress***). When summed, the SSS-W ranges from 30 to 150. Cronbach's alpha was .90 for the current sample.

6.2. IOS (Inclusion of The Other in The Self Scale)

The Inclusion of the Other in the Self (IOS) Scale has been demonstrated (see Appendix IOS) to be an excellent psychometric tool to measure level of closeness in a relationship as well as has substantive suitability as a measure since it can be completed rapidly and yet is not particularly susceptible to social desirability response set effects. The IOS scale has been used in other research studies to depict interconnectedness (Aron et al., 1992). The IOS Scale consists of seven pictures of circles depicting perceived levels closeness in a relationship. In the current study each picture was assigned a number from 1-7 in a Likert scale-like fashion with 1 indicating the ***lowest level*** of intimacy and 7 indicating the ***highest level*** of intimacy.

6.3. The Miller Social Intimacy Scale

Miller Social Intimacy Scale (MSIS), (see Appendix MSIS) a 17-item measure of the maximum level of intimacy currently experienced, that was developed using both married and unmarried non-clinical as well as a married clinical sample. It has good internal validity and test-retest reliability. The MSIS was also proven to be a good measure for married clinical samples. During its development the mean MSIS score for the married students

was significantly greater than that for the distressed married clinic sample, which points to heterogeneity in the level of intimacy experienced by married persons (Miller & Lefcourt, 1982). Cronbach's alpha was .94 for the current sample.

6.4. The Couple's Satisfaction Index

The Couples Satisfaction Index (CSI), is a 32-item scale constructed using items response theory to measure relationship satisfaction. These authors have developed a 16- and a 4-item version of it as well (see Appendix CSI-16). Compared to some other relationship satisfaction scales it has greater power for detecting differences in levels of satisfaction; as well it has demonstrated strong convergent validity with other measures of satisfaction and has an excellent construct validity (Funk et al., 2007). The present study used the 16-item version of the CSI. Scores for the 16-item scale range from 0 ***(no satisfaction)*** to 76 ***(very high satisfaction)***. Cronbach's alpha was .98 for the current sample.

6.5. The Female Sexual Function Index (FSFI-6)

The Female Sexual Satisfaction Index-6 (FSFI-6), (see Appendix FSFI-6) is a six-question abridged version of the Female Sexual Function Index-19. The FSFI-6 showed good internal consistency, reliability and consistency and is a valuable tool to test for Female Sexual Dysfunction (FSD). A score of ***19 or less indicates the possibility of FSD*** present (Isidori et al., 2010). Cronbach's alpha was .80 for the current sample

6.6. Count Variable of Sexual Frequency

We also added an additional question "Please indicate the number of times you have had sexual intercourse with your spouse in the last month" at the end of the battery of questionnaires in order to obtain a measure of sexual frequency.

6.7. Perceived Level of Intimacy

We measured perceived levels of intimacy in a marriage by taking a sum of the standardized results of the SSSW-30, IOS, MSIS-17, and CSI-16 scores for each participant. MI – Marital (Relational) Intimacy ≡ Perceived Level of Intimacy.

In Study I we used Pearson correlation coefficient between scales and found that all were greater than 0.4, with the lowest correlation being between IOS and SSS-W (r=0.44)

and the highest being CSI and MSIS (r=0.78). Further, all scales were positively associated with frequency of sex (all $p < 0.001$) and the sum of the standardized scales were positively correlated with the frequency of sex ($p < 0.0001$).

In Study II prior to data analysis a latent factor score representing relational intimacy was created via a principle components factor analysis using the standardized IOS, MSIS-17, and CSI-16 scores for each participant. Prior to data analysis, a latent factor score representing relational intimacy was created via a principle components factor analysis using the standardized IOS, MSIS-17, and CSI-16 scores for each participant.

The concept of intimacy in this study was understood to mean feelings of closeness, safety, trust, of being known by one's partner, understanding and support. In systemic family therapy, the concept of "differentiation of the self" (DoS) is a fundamental building block of relational intimacy, both in conjugal and other close family relationships. DoS describes the individual's level autonomy and interdependence as well as the interplay of these two concepts within the relational dyad. According to Bowen, DoS determines levels of intimacy within the relationship and spouses with similar levels of DoS tend to marry each other (Larson, 2001). Well-differentiated persons can maintain their sense of self and autonomy even in emotionally escalated situations, while undifferentated persons tend towards excessive emotional involvement, "too much closeness", enmeshement and fusion.

All of the scales used to measure marital intimacy are psychological scales. Consequently, we did not measure feelings of physical closeness and intimacy as an outcome of neurohormonal processes, such bonding, closeness and intimacy upon oxytocin release during sexual activity.

6.8 Study Populations and Settings

Both studies targeted a clinical population. Both studies were conducted according to institutional standards and approved by the Institutional Review Board of the University of Mississippi Medical Center. A total of 68 women have filled out a battery of questionnaires anonymously either online or via a mail-in packet of questionnaires. Response rate was 41% for both online and mail-in combined. Participants for this study were recruited from two sites: a local private practice marriage and family therapy clinic (Clinic 1) and two general psychiatry clinics at the University of Mississippi Medical Center, namely the

Adult Outpatient Psychiatric Clinic (teaching clinic and a private practice clinic) (Clinic 2). In order to qualify for this study, participants had to be heterosexual women currently living in married relationships and enrolled as patients in one of the above mentioned facilities. There was no financial incentive offered for participating in this study. The language of the study was English. To be included in the study, participants had to be English-speaking heterosexual women in cohabiting marital relationships. In the sample, 81% of the participants were Caucasian (non-Hispanic), 13% were African-American and 1.5% Asian-American, and 4.5% did not indicate their race. There was a significant difference between the two samples regarding age and length of marriage: The mean age of participants at the marriage and family therapy clinic was 41 years, and it was 51 years at the University of Mississippi Medical Center (UMMC) clinics ($p = .0001$). Mean length of marriage at the marriage and family therapy clinic was 13 years, and 21 years at the UMMC clinics ($p = .0159$). Although not an inclusion criterion, most participants screened positive for impaired sexual functioning as measured by the six-item Female Sexual Function Index (FSFI-6). Exclusion criteria included heterosexual women in dating or cohabiting unmarried relationships.

Next tables show the participant characteristics of Clinic 1 (Table 11), Clinic 2 (Table 12) and of Overall (Table 13).

Table 11. Participant Characteristic, Clinic 1

Variable	**Mean**	**Median**	**SD**
Frequency of sexual intercourse	5.1	3.5	5.4
Married (years)	13.6	12	10.5
Age (years)	41.2	38.5	10.3
CSI-16	45.8	47	21.8
SSSW-30	91.8	93	22.5
MSIS-17	114.5	116	33.7
IOS	3.6	3	1.9
FSFI-6	16.4	18	6.2

CSI: Couple's Satisfaction Index, max score: 81; MSIS: Miller Social Intimacy Scale, max score 154; IOS: Inclusion of the Other in the Self Scale, max score 7; SSS-W: Sexual Satisfaction Scale for Women, max score: 139; ; FSFI-6: six-item Female Sexual Function Index, max score:27.

Table 12 Participant Characteristic, Clinic 2

Variable	**Mean**	**Median**	**SD**
Frequency of sexual intercourse	3.9	1	5
Married (years)	20.6	22	10.5
Age (years)	50.6	54	9.9
CSI-16	50.3	49	19.5
SSSW-30	96.5	94	25.2
MSIS-17	114.6	119	35.9
IOS	5.9	6	1.2
FSFI-6	15.7	17	6.1

CSI: Couple's Satisfaction Index, max score: 81; MSIS: Miller Social Intimacy Scale, max score 154; IOS: Inclusion of the Other in the Self Scale, max score 7; SSS-W: Sexual Satisfaction Scale for Women, max score: 139; FSFI-6: six-item Female Sexual Function Index, max score: 27

Table 13 Participant Characteristic, Overall

Variable	**Mean**	**Median**	**SD**
Frequency of sexual intercourse	4.7	2.5	5.3
Married (years)	15.6	14	11
Age (years)	44	42	11
CSI-16	47	49	21.1
SSSW-30	93.1	93	23.2
MSIS-17	114.6	116	34
IOS	4.2	4	2
FSFI-6	16.2	17	6.1

CSI: Couple's Satisfaction Index, max score: 81; MSIS: Miller Social Intimacy Scale, max score 154; IOS: Inclusion of the Other in the Self Scale, max score 7; SSS-W: Sexual Satisfaction Scale for Women, max score: 139; FSFI-6: six-item Female Sexual Function Index, max score:27

As it was seen there is some difference between Clinic 1, Clinic 2 groups comparing the ages (Age Clinic 1: 41.2, Clinic 2: 50.6 years) and the married time (Married Clinic 1: 13.6 , Clinic 2 :20.6 years). But there is no significance difference between the Clinic 1 and Clinic 2 groups in the SSSW-30 (91.8 and 96,5), MSIS-17 (114.5 and 114.6) and the FSFI-6 scores (16.4 and 15.7). The highest difference can be seen in case of Inclusion of the Other in the Self Scale scores which measure of the closeness in the relationship. IOS Clinic 1: 3.6 and Clinic 2: 5.9. The elder group has better closeness in the relationship.

The Female Sexual Satisfaction Index-6 (FSFSI-6) is a six-question abridged version of the Female Sexual Satisfaction Index-19. The FSFI-6 showed good internal consistency, reliability, and consistency. The FSFI-6 scores and the answers for the sexual functions (desire, arousal, lubrication, orgasm, satisfaction, pain) are shown Clinic 1 (Table 14), Clinic 2 (Table 15) and Overall (Table 16) groups. A score of FSFI-6 score 19 or less indicates the possibility of Female Sexual Dysfunction in all of three groups.

Table 14 Participant Characteristic, Sexual Function, Clinic 1

Variable	**Mean**	**Median**	**SD**	
Desire	1.7	3	1.4	
Arousal	2.9	3	1.5	
Lubrication	3.4	4	1.7	
Orgasm	3.6	4	1.6	
Satisfaction	2	2	1.4	
Pain	2.9	3	1	
FSFI-6	16.4	18	6.2	

Desire (0-4): very low →very high; arousal (0-5): no →very high; lubrication(0-5): never →always; orgasm (0-5): almost never →almost always; satisfaction (0-4): very dissatisfied →very satisfied; pain (0-4): almost never →almost always

Table 15 Participant Characteristic, Sexual Function, Clinic 2

Variable	**Mean**	**Median**	**SD**
Desire	1.4	1	1.1
Arousal	2.8	3	1.6
Lubrication	3.2	3.5	1.6
Orgasm	3.2	3.5	1.7
Satisfaction	2.1	2	1.5
Pain	2.9	3	1.1
FSFI-6	15.7	17	6.1

Desire (0-4): very low →very high; arousal (0-5): no →very high; lubrication (0-5): never →always; orgasm (0-5): almost never →almost always; satisfaction (0-4): very dissatisfied →very satisfied; pain (0-4): almost never →almost always;

Table 16 Participant Characteristic, Sexual Function, Overall

Variable	**Mean**	**Median**	**SD**
Desire	1.6	2	1.3
Arousal	2.9	3	1.5
Lubrication	3.3	4	1.7
Orgasm	3.5	4	1.6
Satisfaction	2	2	1.4
Pain	2.9	3	1.1
FSFI-6	16.2	17	6.1

Desire (0-4): very low →very high; arousal (0-5): no →very high; lubrication (0-5): never →always; orgasm (0-5): almost never →almost always; satisfaction (0-4): very dissatisfied →very satisfied; pain (0-4): almost never →almost always

Comparing Sexual function of Participant in Clinic 1 (mean age 41.2) and Clinic 2 (mean age 50.6). The result show better sexual functions in case of younger group as it it was expected. The mean FSFI-6 in the younger group Clinic 1 is 16.4 score, while in the Clinic 2 is 15.7. This difference is not significant considering the standard deviations. Hence, we used the Overall (full) group for the further calculations.

Statistical Analysis Study 1

Descriptive statistics are used to describe the study population and FSFI domain responses. Pearson correlations were used to examine simple correlations between FSFI domains. Sexual frequency was modeled using negative binomial regression. Mediation was examined using Baron and Kenny's method (Baron & Kenny, 1986). Data were analyzed with SAS software, version 9.4 (SAS Institute, Cary, NC) and graphs were produced using Stata statistical software, release 13 (StataCorp, College Station, TX).

Statistical Analysis Study II

Mediation analyses were completed utilizing a bias-corrected bootstrapping procedure with 95% confidence intervals (CI) (Shrout & Bolger, 2002). Bootstrapping was used to estimate and determine the statistical significance of all total, direct, and indirect effects. An indirect effect refers to the impact of an independent variable on a dependent variable through a mediating variable. PROCESS v. 2.15 for SPSS v.22 was used for all analyses (Hayes, 2013), and 10,000 samples were derived from the original sample by a process of resampling with replacement. Effect ratios (ER); indirect effect divided by total effect) estimate the proportion of the relationship between FSD and each sexual outcome (total effects) that was attributable to intimacy (indirect effect).

An a priori power analysis indicated sufficient sample size for power > .80 to detect a mediated effect based on the expected moderate-to-large magnitude associations among study variables (Fritz & MacKinnon, 2007).

Chapter 7: RESULTS

7.1 Study I: Sample Characteristics, Correlations, Predictors

All research questions examine sexual frequency as an outcome. The first research questions explored how marital intimacy and the FSFI-6 domains serve as individual

predictors of frequency of sex. Participant responses are presented in Table 17 Participant Responses for Sexual Frequency and FSFI-6 questions.

Table 17 Participant Responses for Sexual Frequency and FSFI-6 questions

	FSFI-6 Questions											
	Desire		Arousal		Lubrication		Orgasm		Satisfaction		Pain	
Response	N	%	N	%	N	%	N	%	N	%	N	%
0	19	28	3	4	4	6	3	4	13	19	0	0
1	11	16	14	21	8	12	9	13	14	21	9	13
2	17	25	6	9	11	16	6	9	10	15	14	21
3	13	19	20	29	7	10	8	12	18	26	19	28
4	6	9	13	19	13	19	14	21	11	16	24	35
5	-	-	11	16	24	35	26	38	-	-	-	-

Where N is the number of the responses

Desire (0-4): very low →very high; arousal (0-5): no →very high; lubrication (0-5): never →always; orgasm (0-5): almost never →almost always; satisfaction (0-4): very dissatisfied →very satisfied; pain (0-4): almost never →almost always

Because sexual frequency is a count variable (can take only non-negative integer values (0, 1, 2, 3 …), and where these integers arise from counting rather than ranking), linear regression assumptions are broken. There are two appropriate methods for modeling count variables: Poisson regression and negative binomial regression. An assumption in Poisson regression is that the mean and variance of the outcome are equal; in our population, the mean of sexual frequency is 4.7 and the variance is 28.2. Because variance is much larger than the mean, Poisson regression is not appropriate and we applied negative binomial regression.

The first *research question* explored how marital intimacy and the FSFI-6 domains serve as individual predictors of frequency of sex. As a basic analysis, we examine the Pearson correlations. These results are presented in Table 18 (Correlations for FSFI-6 domains). We can see that there is a moderate correlation between sexual frequency and the FSFI-6 domains ($r>0.4$, $p<0.05$), the exception of pain ($r=0.1$, $p=0.27$).

Table 18 Correlations for FSFI-6 Domains

Variable	frequency	desire	arousal	lubrication	orgasm	pain	satisfaction
frequency	-						
desire	0.4	-					
arousal	0.5	0.7	-				
lubrication	0.5	0.4	0.6	-			
orgasm	0.4	0.5	0.7	0.6	-		
pain	0.1	0.2	0.2	0.1	-0.1	-	
satisfaction	0.5	0.5	0.6	0.3	0.4	0.3	-

Table 19 Correlations for FSFI-6 and Intimacy

Variable	frequency	desire	arousal	lubrication	orgasm	pain	satisfaction
intimacy	0.5	0.4	0.6	0.4	0.3	0.2	0.6

Further, intimacy is moderately correlated with sexual frequency ($r>0.5$, $p<0.0001$), similar to the FSFI-6 domains (Table 19).

To further explore the individual (univariable) relationships between the FSFI-6 domains and sexual frequency, we applied negative binomial regression (Table 20).

With the exception of pain, all of the FSFI-6 variables significantly predicted frequency of sex ($p<0.0006$). Given the Pearson correlation results for pain ($r=0.1$), this is not surprising. For the five significant domains, as the participant response increases, the expected frequency also increases.

Table 20. Univariable Relationships of Predictors and Frequency of Sex

Predictor	Estimate	*p* value	Interpretation
Desire	1.52	0.0010	As desire increases, frequency increases
Arousal	1.56	< 0.0001	As arousal increases, frequency increases
Lubrication	1.47	< 0.0001	As lubrication increases, frequency increases
Orgasm	1.44	0.0003	As orgasm increases, frequency increases

Pain	1.19	0.2676	--
Satisfaction	1.56	< 0.0001	As satisfaction increases, frequency increases
Intimacy	1.01	< 0.0001	As intimacy increases, frequency increases
Age	0.97	0.0400	As age increases, frequency decreases
Years of Marriage	0.98	0.1514	--

Statistically significant as $p<0.05$ and highly significant as $p<0.001$

The correlation for summed questionnaire and frequency was calculated too (Table 21). We used Pearson correlation coefficient to analyze correlations between the scales and found that all were greater than 0.4, except the lowest correlation being between the IOS and FSFI-6 ($r = 0.3$). The highest correlation was between CSI and SSSW-30 ($r = 0.8$). Further, all scales were positively associated with frequency of sex (all $p < .0010$) and the sum of the standardized scales was positively correlated with frequency of sex ($p < .0001$).

Table 21. Correlations for Summed Questionnaires

Variable	frequency	CSI-16	MSIS-17	SSSW-30	FSFI-6
CSI-16	0.4	-			
MSIS-17	0.6	0.5	-		
SSSW-30	0.5	0.8	0.5	-	
FSFI-6	0.6	0.4	0.6	0.5	-
IOS	0.4	0.7	0.4	0.6	0.3

All of the FSFI-6 variables significantly predicted frequency of sex. Table 22 displays the *calculated expected* frequency, E[Frequency] given a particular response for an FSFI-6 domain.

Table 22. Expected Frequency Based on FSFI Domain Response*

	E[Frequency]					
Response	Desire	Arousal	Lubrication	Orgasm	Pain	Satisfaction
0	2	1	1	1	3	2
1	3	2	2	2	3	3
2	5	3	2	3	4	4
3	8	4	4	4	5	6
4	12	7	5	5	6	10
5	-	11	8	7	-	-
* rounded values						

In the case of sexual desire for every one-unit increase on the FSFI-6 the expected frequency increases by multiplicative factor 1.5. Similar to intimacy as a predictor (presented above) this "estimate" of frequency is the estimate of the regression co-efficient, which is also a multiplicative variable. Table 18 demonstrate how the multiplicative effect works. In order to make it more practical for clinicians to interpret this table we have rounded up the values and included integers only to show expected frequency of intercourse based on this sample. To illustrate this, take the example of a couple where the wife has scored a *1* on the FSFI-6 *desire* question. This couple, based on the current sample, is estimated to have sex about 3 times a month. If her answer to the *desire* question was to change from *1* to *2* then this couple would be expected to have sex about 2 times more than when she answered a "1" to this question. That is, we would expect this couple to have sex about 5 times a month.

In order to test for correlation between perceived levels of "differentiation" within the dyad and sexual frequency, we modeled sexual frequency and answers given by participants just to the IOS Scale. We found that the IOS Scale significantly predicts sexual frequency (p=0.0007), and as IOS scale responses increase by 1 unit, sexual frequency increases by a multiplicative factor of 1.3. The expected frequencies given a particular response of the IOS scale are shown in Table 2324. Further, Figure 2 illustrates expected frequencies against observed frequencies.

Table 23. Expected Frequencies Based on the IOS Scale*

Expected Frequencies Based on the IOS Scale*							
	The Inclusion of Other in the Self scale (IOS)						
Response	1	2	3	4	5	6	7
E[Frequency]	2	2	3	4	5	7	7

* Rounded values,

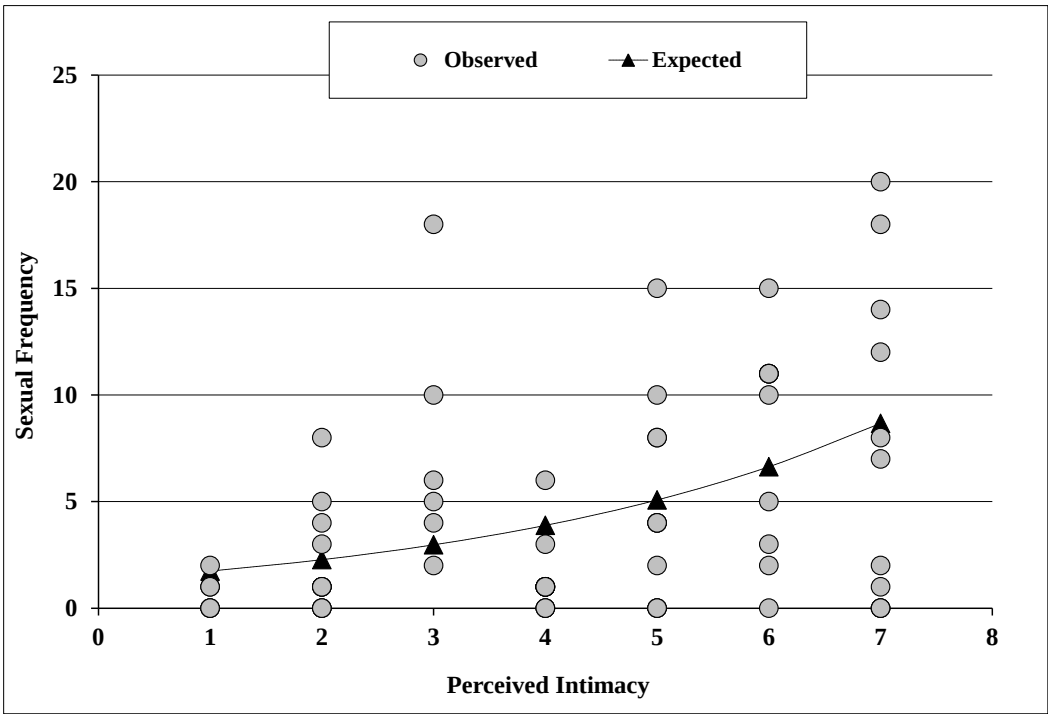


Figure 2 Expected frequencies against observed frequencies

The second research question explored intimacy as a predictor after adjusting for multiple covariates in the model. The first model examines intimacy as a predictor of sexual frequency after adjusting for the FSFI-6 domains, excluding "Satisfaction" since it is not a physiological response. The second model adjusts for both FSFI-6 domains as well as age of participant and length of marriage. Now that we will have multiple covariates in the model, we will still employ negative binomial regression, but now we

employ multiple regression techniques. Results are presented in Table 24. (Multivariable Negative Binomial Regression Results)

Table 24. Multivariable Negative Binomial Regression Results

	Model 1: No Adjustors			Model 2: M1 + Adjustors	
Predictor	Estimate	*p* value		Estimate	*p* value
Desire	1.07	0.7020		1.04	0.8385
Arousal	0.79	0.2569		0.80	0.2355
Lubrication	1.29	0.0237		1.22	0.0820
Orgasm	1.19	0.1182		1.23	0.0687
Pain	1.03	0.8361		1.06	0.7061
Intimacy	1.22	0.0006		1.25	0.0002
Age	--	--		0.97	0.0827
Married	--	--		1.00	0.8035

In the Model 1, without adjusting for age and length of marriage, we find that intimacy remains a significant predictor of sexual frequency (p=0.0006) in the presence of the FSFI-6 domains. Further, we see that lubrication is also a predictor of sexual frequency (p=0.0237) in the presence of intimacy and the FSFI-6 domains. The other FSFI-6 domains (desire, arousal, orgasm and pain) are not statistically significant in the presence of intimacy and other FSFI-6 domains (p>0.05).

In the Model II, now adjusting for the FSFI-6 domains, age and length of marriage, intimacy continues to be a significant predictor of sexual frequency (p=0.0002). After adjusting for age and length of marriage, lubrication is no longer a significant predictor of sexual frequency (p=0.0820), and like before, the other FSFI-6 domains remain insignificant in prediction (p>0.05). Interestingly, age of participant and years of marriage did not significantly predict sexual frequency. Expected frequency can be laid out similarly to the univariate case, however, it is not as straightforward. Many variables are now needed to find an expected sexual frequency. To find expected frequency, the full model is:

$$E[\text{frequency}] = e^{-1.1587 + 0.0213\text{desire} - 0.2471\text{arousal} + 0.2040\text{lubrication} + 0.2136\text{orgasm} + 0.0639\text{pain} - 0.0299\text{age} - 0.0011\text{married} + 0.0106\text{intimacy}}$$

Equation 1: Expected sexual frequency, full model.

Illustrating how to use this equation, take, for example, a woman, who is a newlywed, and indicates high sexual desire and arousal but also reports pain and lack of orgasms. She has been married one year, scores 5 on the desire, 5 on the arousal, 3 on the lubrication but 1 on the orgasm and 1 on the pain questions. Then her expected frequency is:

$$E[\text{frequency}] = e^{-1.1587 + 0.0213(5) - 0.2471(5) + 0.2040(3) + 0.2136(1) + 0.0639(1) - 0.0299(35) - 0.0011(1) + 0.0106(400)}$$
$$= e^{1.7947}$$
$$= 6.02$$

Equation 2: Expected sexual frequency, examples 1.

Thus, we expect someone with these responses and characteristics to have sex approximately 6 times a month.

As another example, someone who has been married for 30 years, is now post-menopausal and scores 4 on the desire, 4 on the arousal, and 5 on the lubrication questions. She feels comfortable in her own body and she lives in an intimate relationship with her husband. She has no orgasmic difficulties but has some pain issues mainly related to hormonal changes in menopause. She scores 1 on the orgasm and 4 on the pain questions. Then her expected frequency is:

$$E[\text{frequency}] = e^{-1.1587 + 0.0213(2) - 0.02471(2) + 0.2040(1) + 0.2136(5) + 0.0639(1) - 0.0299(60) - 0.0011(30) + 0.0106(300)}$$
$$= e^{1.0788}$$
$$= 2.94$$

Equation 3: Expected sexual frequency, examples 2

Thus, we expect someone with these responses and characteristics to have sex approximately 3 times a month.

The third research question explored the extent to which marital intimacy serves as a mediator between sexual functioning and sexual frequency. To answer this question, we follow steps laid out by Baron and Kenny (Baron & Kenny, 1986). These results are laid out in Table 25 and Table 26.

Table 25 Multivariable General Linear Regression, Mediation Exploration: Perceived *Intimacy as Outcome*

	No Adjustors			Adjustors	
Predictor	Estimate	*p* value		Estimate	*p* value
Desire	12.15	0.1636		13.31	0.0942
Arousal	17.60	0.0692		20.28	0.0195
Lubrication	2.63	0.6525		5.01	0.3680
Orgasm	-1.70	0.7919		-2.52	0.6696
Pain	4.42	0.5433		1.13	0.8717
Age				0.83	0.3328
Married				0.15	0.8592

Table 26. Multivariable Negative Binomial Regression. Mediation Exploration: *Sexual Frequency as Outcome*

	Without Intimacy			With Intimacy	
Predictor	Estimate	p-value		Estimate	p-value
Desire	0.2352	0.2132		0.0213	0.9041
Arousal	0.0285	0.8876		-0.2471	0.2101
Lubrication	0.1179	0.3562		0.204	0.0776
Orgasm	0.2132	0.0893		0.2136	0.0629
Pain	0.0629	0.7017		0.0639	0.6631
Age	-0.0225	0.2506		-0.0299	0.0905
Married	-0.001	0.958		-0.0011	0.9493
Intimacy				0.0106	0.0004

* These use regression estimates, not the multiplicative increase

First, we model intimacy as the dependent variable. Because this variable is a sum and has a large range of responses, we treat it as a continuous variable. Thus, linear regression is valid and we applied multiple regression techniques. For a variable to be considered a mediator, we must verify that it is correlated with the other variables in the regression model. The only variable that significantly predicted intimacy was arousal (p=0.0195) in the model adjusting for age and length of marriage.

Second, we modeled the full model (adjusting for age and length of marriage). Note that because we are again modeling sexual frequency, we are using negative binomial regression. After verifying that intimacy is a significant predictor of sexual frequency (p=0.0004). We reduce the model by taking intimacy out of the regression model. We now compare regression coefficients from the full model $(\hat{b} = -0.2471)$ and the reduced model $(\hat{b} = 0.0285)$. If the absolute value of the regression coefficient from the full model is less than the absolute value of the regression coefficient from the reduced model, we have verified that intimacy mediates arousal. However, because 0.2471>0.0285, we can conclude that intimacy is not a mediator for arousal

7.2 Study II: Sample Characteristics, Correlations, Predictors

Prior to data analysis, a latent factor score representing relational intimacy was created for each participant using principle components factor analysis with varimax rotation using the standardized IOS, MSIS-17, and CSI-16 scores (Table 27). The factor analysis strongly supported a single-factor solution for the intimacy variable (78.9% variance accounted for; factor loadings range 0.71-0.87; eigenvalue = 2.24). The resultant intimacy factor score was used in all mediation models described below.

Table 27. Factor Loadings for Construction of Intimacy Latent Factor Scores

Measures	Intimacy (F1)
IOS	0.85
MSIS-17	0.88
CSI-16	0.94

Note: Only one factor was extracted during analysis. F1 = Factor 1; CSI = Couple's Satisfaction Index; IOS = Inclusion of the Other in Self Scale; MSIS = Miller Sexual Intimacy Scale.

The clinic settings differed significantly on mean age ($p < .01$) and marital duration ($p < .02$). (Table 28 and Table 29) These variables were considered initially as potential covariates in all models; however, neither variable was a significant covariate in any mediation model (all $p \geq .09$), and the pattern of results was identical without covariates. Therefore models are reported without covariates.

Table 28 Descriptive statistics of sample

	Overall			Clinic 1			Clinic 2			
Variable	***Mean***	***Median***	***SD***	***Mean***	***Median***	***SD***	***Mean***	***Median***	***SD***	***p***
Age (y)	44.3	43.0	10.9	41.2	38.5	10.3	52.2	54.5	8.2	$p \leq .01$
Married (y)	15.6	14.0	11.0	13.6	12.0	10.5	20.9	23.0	10.9	$\leq .05$
Frequency	4.6	2.0	5.3	5.0	3.5	5.4	3.5	1.0	4.9	.33
CSI-16	47.2	49.0	21.2	45.8	47.0	21.8	51.2	52.0	19.6	.36
SSSW-30	93.1	93.0	23.4	91.8	93.0	22.5	96.7	93.5	26.0	.45
MSIS-17	114.6	118.0	34.3	114.5	116.0	33.7	114.8	123.0	37.0	.98
IOS	4.2	4.0	2.0	3.6	3.0	1.9	5.9	6.0	1.3	$p \leq .01$
FSFI-6	16.2	17.0	6.1	16.4	18.0	6.2	15.6	17.0	6.3	.64

Note: CSI= Couple's Satisfaction Index; FSFI-6= Female Sexual Function Index; IOS= Inclusion of the Other in the Self Scale; MSI= Miller Social Intimacy Test; SD= Standard Deviation; SSS-W= Sexual Satisfaction Scale for Women; y = year

Table 29. Descriptive statistics according to sexual functioning groups

	Impaired		**Non-Impaired**		
Variable	***Median***	***IQR***	***Median***	***IQR***	***p***
Frequency	1.00	18	8.00	12	$p \leq .01$
Married	14.00	16	12.00	21	.38
Age	44.00	21	40.00	20	.42
Summary Scores					
CSI	44.50	31.75	67.00	21.50	$p \leq .05$
FSFI	13.00	8	23.00	4	$p \leq .01$
IOS	4.00	3	6.00	3	.05
MSI	114.00	44.75	142.00	35.50	$p \leq .05$
SSS-W	84.50	18	120.00	22	$p \leq .01$

Note: CSI= Couple's Satisfaction Index; FSFI-6= Female Sexual Function Index; IOS= Inclusion of the Other in the Self Scale; IQR= Interquartile Range; MSI= Miller Social Intimacy Test; SD = Standard Deviation; SSS-W= Sexual Satisfaction Scale for Women.

The first hypothesis examined marital intimacy as a mediator between the relationship of impaired sexual functioning with sexual *satisfaction* and sexual *distress*, respectively.

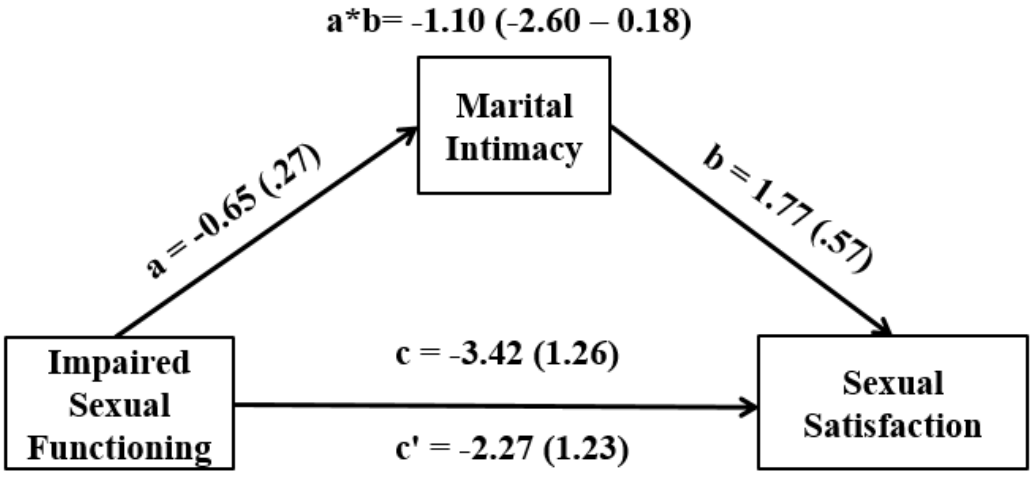


Figure 3. Schematic of bootstrapped mediation models predicting sexual satisfaction according to impaired sexual functioning status. Values represent unstandardized

coefficients. Values in parenthesis reflect standard error except the indirect a*b pathway which displays 95% CI

Impaired sexual functioning exerted a significant indirect effect on sexual satisfaction (ER = 31.2%) and sexual distress (ER= 33.2%) through marital intimacy (*b*= -1.10 and -1.17; all 95% CIs exclude 0.0) See Figure 3. As seen in Figure 4, inspection of the directionality of effects indicated that women with impaired sexual functioning reported lower marital intimacy, which in turn predicted lower sexual satisfaction and greater sexual distress. Lower marital intimacy accounted for sizeable proportions of the relationships between impaired sexual functioning and sexual satisfaction (ER=31%) and sexual distress (ER=33%). In Figure 3 values reflect unstandardized b coefficients and corresponding standard errors in parentheses (except indirect effect which shows 95% confidence interval). Pathway notation reflects standard nomenclature. c and c' reflect the total and indirect effect of FSD on sexual functioning before and after accounting for intimacy symptoms, respectively. Covariates were omitted for visual clarity.

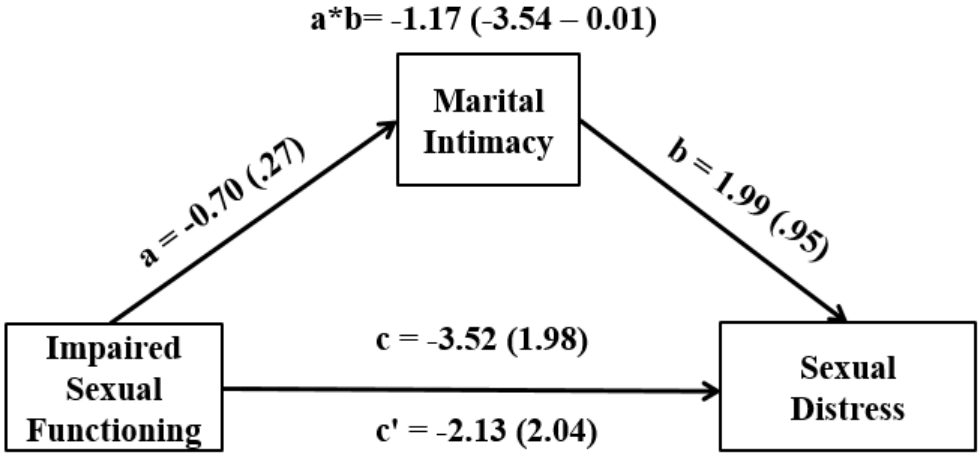


Figure 4. Mediation pathway of impaired sexual functioning predicting sexual distress. Values represent unstandardized coefficients. Values in parenthesis reflect standard error expect the indirect a*b pathway which displays 95% CI

The second hypothesis examined marital intimacy as a mediator between impaired sexual functioning and sexual *frequency* (Figure 5; Table 31 and Table 32). Women with impaired sexual functioning reported more infrequent intercourse (mean difference = 5.12

days), which was significantly mediated by marital intimacy (*b*= -1.55). The ER indicated that intimacy accounted for 30% of this association. The *mediation models* were repeated with each individual intimacy indicator. The pattern of results was identical for sexual frequency across all three indicators. The CSI was also a significant mediator for distress but not sexual satisfaction. The MSIS did not significantly mediate sexual satisfaction and distress. However, all non-significant results were in the direction of reported effects with 95% CIs narrowly overlapping with 0.0.

Additional moderated mediation analyses probed whether the indirect effects identified above were altered by age and marital duration. Results revealed that the mediated relationship between sexual functioning and satisfaction through relational intimacy was strongest for older women (*p*=0.04). All other indirect effects were independent of age (*p*= 0.41 to 0.95) and marital duration (*p*= 0.18 to 0.76).

In Figure 3 and Figure 4 values reflect unstandardized b coefficients and corresponding standard errors in parentheses (except indirect a*b effect which shows 95% confidence interval). Pathway notation reflects standard nomenclature. c and c' reflect the total and indirect effect of FSD on sexual functioning before and after accounting for intimacy symptoms, respectively. Covariates were omitted for visual clarity.

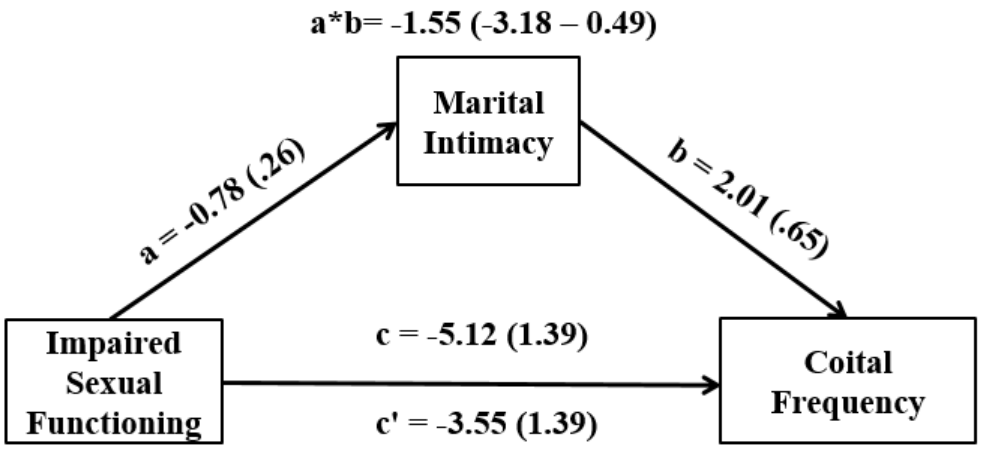


Figure 5. Mediation pathways of impaired sexual functioning predicting coital frequency. Values in parenthesis reflect standard error expect the indirect a*b pathway which displays 95% C

Table 30. Impact of Female Sexual Dysfunction and Intimacy on Sex Frequency, Satisfaction and Distress. *Unstandardized* data.

			Sexual outcome (patient report)					
			Frequency of sex		**Satisfaction**		**Distress**	
Path			**$B_{unstand}$**	**$SE_{unstand}$**	**$B_{unstand}$**	**$SE_{unstand}$**	**$B_{unstand}$**	**$SE_{unstand}$**
Total effect	**c**	ISF → sexual functioning	-5.12	1.39	-3.42	1.26	-3.52	1.98
Direct effects	**a**	ISF → intimacy	-0.78	0.26	-0.65	0.27	-0.7	0.27
	b	intimacy → sexual functioning	2.01	0.65	1.77	0.57	1.99	0.95
	c'	ISF → sexual functioning	-3.55	1.39	-2.27	1.23	-2.13	2.04
Indirect Effects	ab	ISF → intimacy → sexual functioning	-1.55	0.67	-1.1	0.6	-1.17	0.89
		95% CI of Bootstrap	-3.18 to -0.49		-2.6 to -0.18		-3.54 to -0.01	
		effect ratio, %	30.2		31.2		33.23	
Model			R^2=0.30		R^2=0.24		R^2=0.12	

ISF = impaired sexual functioning; SE = standard error; unstand = unstandardized. ; *Bias-corrected bootstrapping was used for all analyses with covariates. Path labels reflect standard nomenclature (cf Fritz and MacKinnon); c and c' reflect the total and direct effects of female sexual dysfunction on sexual functioning before and after accounting for intimacy symptoms, respectively.

Table 31. Impact of Female Sexual Dysfunction and Intimacy on Sex Frequency, Satisfaction and Distress. *Standardized* data.

			Sexual outcome (patient report)								
			Frequency			**Satisfaction**			**Distress**		
Path			**B_{stand}**	**SE_{stand}**	**p**	**B_{stand}**	**SE_{stand}**	**p**	**B_{stand}**	**SE_{stand}**	**p**
Total effect	c	ISF → sexual functioning	-0.97	0.26	‡	-0.74	0.27	‡	-0.79	0.27	0.08
Direct effects	a	ISF → intimacy	-0.77	0.26	‡	-0.65	0.27	‡	-0.18	0.4	†
	b	intimacy → sexual functioning	0.44	0.12	‡	0.43	0.13	‡	0.33	0.13	†
	c'	ISF → sexual functioning	-0.63	0.26	†	-0.46	0.26	0.07	-0.58	0.27	0.03
Indirect Effects	ab	ISF → intimacy → sexual functioning	-0.34	0.14	‡	-0.28	0.14	†	-0.21	0.12	†
		Model summary			‡			‡			†

ISF = impaired sexual functioning; SE = standard error; unstand = unstandardized. ; *Bias-corrected bootstrapping was used for all analyses with covariates. Path labels reflect standard nomenclature (cf Fritz and MacKinnon); c and c' reflect the total and direct effects of female sexual dysfunction on sexual functioning *before* and *after accounting for intimacy symptoms*, respectively. **†P ≤ .05; ‡P ≤ .01**

Chapter 8: DISCUSSION

8.1 Study I.

The present study explored the relationship between perceived levels of marital intimacy and sexual frequency. In particular we examined the ways in which marital intimacy and the FSFI-6 variables predict sexual frequency among heterosexual married women both before and after controlling for other relationship variables such as age and years of marriage. In unison with our first and second hypothesis we have found that higher marital intimacy scores significantly predict sexual frequency as each FSFI-6 variable (excluding satisfaction) significantly predicts sexual frequency. This finding suggests that marital intimacy is an important factor in sexual frequency. Age was not found to be a significant predictor of sexual frequency. This might be because the current sample was a clinical sample and included a relatively high percentage of women who met the criteria for sexual dysfunction regardless of their age. Another possible reason might be that older women have more sexual experience and have already worked through some sexual difficulties that their younger counterparts have not. This might also explain why length of marriage did not end up being a significant predictor in sexual frequency. Although the author does not currently know of a research study which would explore this correlation, anecdotal evidence suggests that older women and women who have been married longer have a better grasp on their sexual function and they are more likely have integrated sexuality into their relationships and life stories than younger women. Lastly, our analytic method measured whether intimacy is a predictor in sexual frequency and not the reason for it.

Contrary to our hypothesis, marital intimacy was not found to be a mediator of the FSFI-6 variables and sexual frequency. Based on this finding, we speculate that sexual frequency is a matter of relational negotiation and in a sense a “choice” or a “mutual agreement” instead of a causal effect of intimacy levels within the marriage. This observation is particularly apparent when observing the correlation between the IOS Scale and sexual frequency. We are highlighting this in particular since it is a unique pictorial scale and can be easily used to measure “interpersonal interconnectedness” in a marriage. A woman might score as high as a 7 on the scale and have very low to no sexual frequency reported. On the

other hand, she might score very low on the IOS Scale yet indicate a high sexual frequency. Although McNulty et al. (McNulty et al., 2016) measured the correlation of marital satisfaction and change of sexual frequency, which are different constructs than what we measured, their finding indicated a similarly surprising result. Again, our finding could be the result of the current sample being a clinical sample with the majority of participants meeting the criteria for sexual dysfunction. Interestingly, none of the FSFI-6 variables mediates the relationship between intimacy and frequency. This might come as a surprise, as one might expect variables such as "pain" to be significant mediator. In general, this finding diverges from the findings of Desrosiers et al. (Desrosiers et al., 2008) on painful intercourse, possibly because their sample size was homogeneous to vulvar pain and thus may not be generalizable to our sample or the entire population. To explain our finding, we again have to rely on some anecdotal evidence from clinical experience that suggests that women have a tendency to "tough it out" and still engage in sexual activity despite the presence of unpleasant side effects such as pain, for the sake of relational benefits. This finding might be significant in the sense that it supports recent sexual desire models that take multiple relational factors into consideration.

These findings suggest that enhancing marital intimacy and facilitating healthy relational negotiation should be considered important factors in sex therapy; however, this might not necessarily translate into an increase in sexual frequency. Sexual frequency appears to be correlated with but not caused by perceived levels of relational closeness. The author believes that the field would greatly benefit from further research in this subject.

Additionally, the FSFI-6 is an easy-to-use quick assessment tool that can alert clinicians about the possible presence of female sexual dysfunction when a patient scores 19 or less, prompting further inquiry into the marital intimacy in the relationship.

8.2 Study II.

The current investigation examined the meditating role of marital intimacy on the association of impaired female sexual functioning with several sexual behavioral and psychological outcomes (sexual frequency, sexual satisfaction, and sexual distress). A number of interesting results emerged from this study. First, women with impaired sexual functioning reported lower sexual satisfaction and greater sexual distress than women

without impaired sexual functioning, and this difference was mediated by lower rates of perceived marital intimacy. This suggests a compensatory role for marital intimacy in protecting relational and sexual interference associated with impaired sexual functioning and mirrors other research implicating marital closeness' protective function, especially in permanent relationships (Stephenson & Meston, 2010, 2015; Stephenson, 2010; Witherow et al., 2016). Further, results are consistent with and provide support for social exchange models such as the Interpersonal Exchange Model of Sexual Satisfaction (IEMSS) that view sexual satisfaction as a balance between sexual rewards and costs. In this frame, greater relational intimacy operates as a protective factor either through enhancing relationship reward or by increasing sexual frequency and satisfaction, or as a factor that decreases sexual costs such as distress. Given that distress rises as sexual desire discrepancy between marital partners intensifies (Willoughby et al., 2014), the results speak to the possibility that intimacy may also serve as a marker for discrepant partner desires.

Though marital intimacy mediated some associations, a link persisted between impaired sexual functioning and sexual satisfaction and sexual distress. This connection underscores the potential negative impact impaired sexual functioning may pose on women's general sex life despite adequate perceived levels of marital intimacy. Collectively, this primary finding highlights the important interplay among relational factors in women's sexual health in general, and among women with chronic sexual health difficulties such as impaired sexual functioning. Regarding generalizability of these results to the Hungarian population, author speculates that relational factors would play a similar role and consequently would yield similar results on a Hungarian sample. One possible difference may be the moderating factor "high religiosity" of the samples, which may be difficult to replicate in Hungary. While we did not directly test for the moderating effect of religiosity, we speculate that such strong associations of relationship factors with sexual function may be affected by the cultural setting and religious beliefs of the study participants. Both original research studies were carried out in Mississippi, which is popularly called the "buckle of the Bible belt" for its predominantly Christian (Protestant) cultural values. In this cultural setting, strong biblical values dominate, pre-marital and extra-marital sex is highly discouraged, and the marital union is strongly protected, even legally. Similarly, author of this dissertation identifies as an evangelical Christian, which may have also influenced the study sample at the clinic site

where she works, in that this clinic site attracts patients looking for psychological treatment in alignment with biblical values. The rest of the research sites are general psychiatric outpatient clinics where religiosity may play a less significant role since these clinics are for medication management and not psychotherapy.

Contrary to other studies, younger women in our sample did not report higher levels of distress about their sexual functioning, satisfaction, or intimacy (Hendrickx et al., 2015; Stephenson & Meston, 2012). This finding suggests that sexual dysfunction's indirect impact on these characteristics via marital intimacy may be independent of age. This may reflect the overall older age of the sample compared to previous studies that included more on younger, collegiate convenience samples that are less representative of treatment-seeking women in clinical practice. Another possible reason for this finding is that younger women may have more autonomous self-perceptions, less worries about attractiveness, and thus less distress for mate guarding (Dillon et al., 2014).

The second hypothesis was confirmed; specifically that relational intimacy mediated the impact of impaired sexual functioning on lower sexual frequency. Women with impaired sexual functioning reported experiencing lower relational intimacy and less frequent sexual encounters than women with non-impaired sexual functioning, consistent with prior research (Hayes et al., 2008). Notably, the magnitude of the effect indicated that intimacy accounted for 1.5 days of the 5-day difference in sexual frequency reported by the groups. This illustrates the intentional nature of female sexual desire and how committing to engage in sexual activity is a complex decision-making process (Ferreira et al., 2015; Sims & Meana, 2010). For instance, Giles and McCabe (Giles & McCabe, 2009) found that women with FSD who may experience less physical satisfaction during sex nevertheless are more likely to be motivated by relational intimacy-based reasons to have sex, deriving a sense of sexual satisfaction from such sexual activity (Giles & McCabe, 2009). These findings extend previous studies demonstrating that physical aspects of sexual response in women, including arousal, vaginal lubrication, and orgasm, were poor predictors of distress while relational consequences played a mediating role between the two factors (Bancroft et al., 2003; Stephenson, 2010). Taken together, this finding emphasizes the need for providers to take relational issues into greater consideration when patients report feeling distressed about their impaired sexual functioning or coital frequency.

In general, neither age nor marital duration altered the primary mediation results. This implies that the role of relational intimacy in mediating sexual outcomes in impaired sexual functioning is robust to individual differences in age and marital duration. This pattern is inconsistent with theoretical models that predict habituation of sexual frequency and sexual interest as a function of greater marital duration and relational intimacy (Perel, 2007; Schnarch, 2000, 2010; Schnarch, 1997). The one exception to this pattern indicated that intimacy played a stronger mediating role in sexual satisfaction as age increased. This discovery expands on prior findings that showed a decline in sexual frequency over time, with age being the factor most highly predictive of sexual frequency (Call et al., 1995). While this study was cross-sectional, it was observed that older age predicted lower sexual frequency (p = .03). Future research should examine the stability of the link between marital intimacy and sexual frequency, and whether age may moderate this association.

The unique contribution of our study includes methodological and statistical advances including our use of a sample of treatment-seeking, married women in established relationships. Because of the permanence of the relationship, and a more solidified narrative of sex (Moore, 2010), married women and women in long-term relationships have had more opportunities to develop adaptive behaviors that result in reaching desired levels of marital intimacy and are more likely to have learned to navigate their inner sexual maps within the relationship, despite challenges such as impaired sexual functioning. Thus, for married women with impaired sexual functioning, engaging in sexual intimacy may become a "choice" based on relational factors and commitment to the relationship rather than a physiological drive. This speculation is consistent with the conclusions of a study that found that, in their sample, married couples had a high level of interpersonal exchange and commitment to the relationship even though the quality of their relationship was somewhat lower than for cohabitating or dating couples (Moore et al., 2001). Finally, use of a bootstrapped mediation analyses and latent factor scores to improve construct measurement are notable strengths of our study.

Chapter 9: CONCLUSION

9.1 Study I

These findings suggest that enhancing marital intimacy and facilitating healthy relational negotiation should be considered important factors in sex therapy; however, this might not necessarily translate into an increase in sexual frequency. Sexual frequency appears to be correlated with but not caused by perceived levels of relational closeness.

9.2 Study II

Existing evidence suggests that with marital satisfaction, a warm interpersonal climate matters more than sexual frequency, whereas relationship permanence drives sexual frequency (Schoenfeld et al., 2017; Stroope et al., 2015). Results also highlight the need for screening and assessment for impaired female sexual functioning.

Marital intimacy has an important role within the mosaic of female sexuality (Mark et al., 2014; Murray et al., 2014; Shrier & Blood, 2015). Targeting marital intimacy may itself enhance the efficacy of interventions aimed at increasing sexual functioning, sexual satisfaction, and decreasing sexual distress. Intimacy interventions should test for positive impacts on key psychological and behavioral aspects of sexual functioning for women with impaired sexual functioning.

Chapter 10: MAIN STATEMENTS

Even though there is rarely a simple cure for the issue of sexual frequency within a marriage, understanding the correlation between relational intimacy and sexual frequency will also help guide clinical practice in treatment choices for couples that report distress about sexual frequency in their relationship. Our studies are unique in that they use a clinical sample of married women, much like what a clinician may encounter in his or her office-based practice, and clinical measures that are easy-to-use for clinicians in order to make an assessment.

-In unison with our first and second hypothesis in Study I, we have found that higher marital intimacy scores significantly predict sexual frequency as each FSFI-6 variable (excluding satisfaction) significantly predicts sexual frequency. This finding suggests that marital intimacy is an important factor in sexual frequency.

-Women with impaired sexual functioning reported lower sexual satisfaction and greater sexual distress than women without impaired sexual functioning, and this difference was mediated by lower rates of perceived marital intimacy. This suggests a compensatory role for marital intimacy in protecting relational and sexual interference associated with FSD.

- Women with impaired sexual functioning reported more infrequent intercourse (M_{diff} = 5.12 days), which was significantly mediated by marital intimacy (*B*= -1.55). Intimacy accounted for 30% of this association. Notably, the magnitude of intimacy's mediating effect indicated that it accounted for 1.5 days of the 5-day differences in sexual frequency reported by the groups. While not directly comparable, the FDA-approved drug for hypoactive sexual desire disorder, Flibanserin, only averaged a placebo-corrected increase of "satisfying sexual events" from 0.5 to 1 per month among participants (Jaspers et al., 2016).

10.1 Limitations and Suggestions for further research

Clearly, relationship dynamics play an important role in women's sexual experiences perhaps even more so than they do for men (Meltzer et al., 2014; Witherow et al., 2017).

While both of these lines of theories are circular and not linear in causality, unfortunately, the cross-sectional design of the current study doesn't allow for the investigation of the underlying explanations for causality from a systemic perspective.

The criterion of using only a sample of clinical participants may have biased the sample since it limited our opportunity to recruit a larger representation from a variety of age groups or ethnic backgrounds. However this requirement was necessary given our aim to provide more research on clinical populations. In regards to future directions, authors believe that this current study should be replicated on different clinical populations such as married men or women in long-term dating relationships in order to gain more knowledge about the relationship between intimacy and sexual frequency in committed relationships. Sexual frequency appears to be correlated with but not caused by perceived levels of relational closeness therefore author believes that the field would greatly benefit from further research in this subject especially when it comes to measuring "differentiation" and "interpersonal interconnectedness" as they relate to sexual frequency, relational negotiation and sexual desire discrepancy within a marriage.

Further limitations include lack of data about specific clinical diagnoses, reliance on only coital frequency, and a homogenous sample in age, ethnicity, sexual orientation, and marital status. Recruitment from clinical settings may have oversampled women at risk for sexual dysfunction. Another limitation is combining a variety of sexual dysfunctions under the umbrella term impaired sexual functioning. Additionally, the FSFI-6 uses DSM-IV criteria to define risk for impaired sexual functioning, which is less stringently defined than current, more quantifiably defined DSM-5 definitions of the various sexual dysfunctions. Thus, caution is warranted regarding how the findings generalize to DSM-5 defined FSD. Future studies should include both sexual partners' perspectives and examine subgroups based on physiological and desire-based pathology, as well as include more diverse measures of sexual activities.

10.2 Implications for clinical practice

Female Sexual Dysfunction and marital discord around sexual frequency are common presenting problems in psychotherapy office. We believe that it is important for clinicians to address the individual or the couple's narrative about sex, their sexual scripts and the cognitive appraisal that they attribute to coital frequency. In many cultures coitus is prioritized as the main focus of the sexual experience between the couple and this emphasis can easily create expectations that may put undue pressure on women with or without FSD. Author believes that psychoeducation about the female sexual response cycle vs. the male sexual response cycle should be integral part of the marital therapy process. Systems therapy, Gottman couple's therapy, narrative therapy techniques, Internal Family Therapy as well as CBT techniques are all effective modalities when treating desire or frequency issues. Parallel to couple's therapy, author strongly recommends the use of other clinical techniques such as sensate focus exercises and communication exercises for best therapy outcome.

Chapter 11: SUMMARY

Female Sexual Dysfunction has been consistently shown to be prevalent worldwide both in community and clinical samples. The high prevalence of sexual concerns indicates the importance of addressing the etiology, correlations, associations, treatment methods and outcomes for sexual disorders. Despite the need to have more validated research on clinical populations there is still just a dearth of studies targeting treatment-seeking populations. Our research is unique in that it attempts to contribute to the field by tying data from the psychology of close relationships to sexual outcomes. It is also unique in that it targets treatment-seeking heterosexual married women, a dominant segment of clinical work, yet one that has received disproportionately little attention in the literature.

We investigated the mediating role that marital intimacy plays in sexual frequency both for women with and without sexual dysfunction. We found that levels of marital intimacy are a strong predictor of sexual frequency in marriages both for women with and without impaired sexual function. Interestingly, age of participant and years of marriage did not significantly predict sexual frequency. We also have found that marital intimacy has a mediating role on sexual frequency and Female Sexual Dysfunction (DSM-IV-TR). . We have attributed this later finding again to the meditating effects of marital intimacy, which, we speculate, has a protective function on the relationship and allows the couple to negotiate their sexual exchange minimizing relational threats and mate-guarding. We theorize that this protective function of marital intimacy acts both via secure attachment and a deeper knowledge of one's partner and the narrative the couple shares about sexuality. Mediation results showed such a strong effect that we believe it to be imperative for clinicians to address relational aspects in the treatment of women with FSD.

Chapter 12: SURVEYS

12.1 Sexual Satisfaction Scale- W

SSS-W	Response options
Q1: I feel content with the way my present sex life is.	1 = Strongly disagree 2 = Disagree a little 3 = Neither agree or disagree 4 = Agree a little 5 = Strongly agree
Q2: I often feel something is missing from my present sex life.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree
Q3: I often feel I don't have enough emotional closeness in my sex life.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree
Q4: I feel content with how often I presently have sexual intimacy (kissing, intercourse, etc.) in my life.	1 = Strongly disagree 2 = Disagree a little 3 = Neither agree or disagree 4 = Agree a little 5 = Strongly agree

Q5: I don't have *any* important problems or concerns about sex (arousal, orgasm, frequency, compatibility, communication, etc.).	1 = Strongly disagree 2 = Disagree a little 3 = Neither agree or disagree 4 = Agree a little 5 = Strongly agree

Q6: Overall, how satisfactory or unsatisfactory is your present sex life?	5 = Completely satisfactory 4 = Very satisfactory 3 = Reasonable satisfactory 2 = Not very satisfactory 1 = Not at all

Q7: My partner often gets defensive when I try discussing sex.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a litte 1 = Strongly agree

Q8: My partner and I do not discuss sex openly enough with each other, or do not discuss sex often enough.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q9: I usually feel completely comfortable discussing sex whenever my partner wants to.	1 = Strongly disagree 2 = Disagree a little 3 = Neither agree or disagree 4 = Agree a little 5 = Strongly agree

Q10: My partner usually feels completely comfortable discussing sex whenever I want to.	1 = Strongly disagree 2 = Disagree a little 3 = Neither agree or disagree 4 = Agree a little 5 = Strongly agree

Q11: I have no difficulty talking about my deepest feelings and emotions when my partner wants me to.	1 = Strongly disagree 2 = Disagree a little 3 = Neither agree or disagree 4 = Agree a little 5 = Strongly agree

Q12: My partner has no difficulty talking about their deepest feelings and emotions when I want him to.	1 = Strongly disagree 2 = Disagree a little 3 = Neither agree or disagree 4 = Agree a little 5 = Strongly agree
Q13: I often feel my partner isn't sensitive or aware enough about my sexual likes and desires.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q14: I often feel that my partner and I are not sexually compatible enough.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q15: I often feel that my partner's beliefs and attitudes about sex are too different from mine.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q16: I sometimes think my partner and I are mismatched in needs and desires concerning sexual intimacy.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q17: I sometimes feel that my partner and I might not be physically attracted to each other enough.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q18: I sometimes think my partner and I are mismatched in our sexual styles and preferences.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q19: I'm worried that my partner will become frustrated with my sexual difficulties.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q20: I'm worried that my sexual difficulties will adversely affect my relationship.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q21: I'm worried that my partner may have an affair because of my sexual difficulties.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q22: I'm worried that my partner is sexually unfulfilled.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q23: I'm worried that my partner views me as less of a woman because of my sexual difficulties.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q24: I feel like I've disappointed my partner by having sexual difficulties.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q25: My sexual difficulties are frustrating to me.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q26: My sexual difficulties make me feel sexually unfulfilled.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q27: I'm worried that my sexual difficulties might cause me to seek sexual fulfillment outside my relationship.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

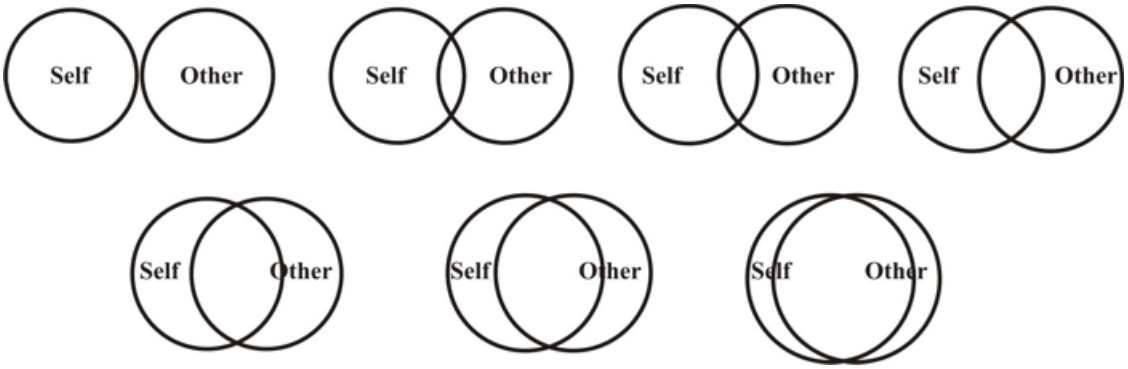
Q28: I'm so distressed about my sexual difficulties that it affects the way I feel about myself.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q29: I'm so distressed about my sexual difficulties that it affects my own well-being.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

Q30: My sexual difficulties annoy and anger me.	5 = Strongly disagree 4 = Disagree a little 3 = Neither agree or disagree 2 = Agree a little 1 = Strongly agree

12.2 The Inclusion of Other in the Self scale (IOS)

Instructions: Please **circle** the picture that best describes your current **relationship** with your romantic partner.



12.3 THE MILLER SOCIAL INTIMACY SCALE

	very rarely			some of the time				almost always		
1. When you have leisure time how often do you choose to spend it with him/her alone?	1	2	3	4	5	6	7	8	9	10

	very rarely			some of the time				almost always		
2. How often do you keep very personal information to yourself and do not share it with him/her?	1	2	3	4	5	6	7	8	9	10

	very rarely			some of the time				almost always		
3. How often do you show him/her affection?	1	2	3	4	5	6	7	8	9	10
	very rarely			**some of the time**				**almost always**		
4. How often do you confide very personal information to him/her?	1	2	3	4	5	6	7	8	9	10
	very rarely			**some of the time**				**almost always**		
5. How often are you able to understand his/her feelings?	1	2	3	4	5	6	7	8	9	10
	very rarely			**some of the time**				**almost always**		
6. How often do you feel close to him/her?	1	2	3	4	5	6	7	8	9	10
	not much			**a little**				**a great deal**		

7. How much do you like to spend time alone with him/her?	1	2	3	4	5	6	7	8	9	10
	not much			**a little**				**a great deal**		
8. How much do you feel like being encouraging and supportive to him/her when he/she is unhappy?	1	2	3	4	5	6	7	8	9	10
	not much			**a little**				**a great deal**		
9. How close do you feel to him/her most of the time?	1	2	3	4	5	6	7	8	9	10
	not much			**a little**				**a great deal**		
10. How important is it to you to listen to his/her very personal disclosures?	1	2	3	4	5	6	7	8	9	10
	not much			**a little**				**a great deal**		
11. How satisfying is you relationship with him/her?	1	2	3	4	5	6	7	8	9	10
	not much			**a little**				**a great deal**		
12. How affectionate do you feel towards him/her?	1	2	3	4	5	6	7	8	9	10
	not much			**a little**				**a great deal**		
13. How important is it to you that he/she understands your feeling?	1	2	3	4	5	6	7	8	9	10
	not much			**a little**				**a great deal**		

14. How much damage is caused by a typical disagreement in your relationship with him/her?	1	2	3	4	5	6	7	8	9	10
	not much			**a little**				**a great deal**		
15. How important is it to you that he/she be encouraging and supportive to you when you are unhappy?	1	2	3	4	5	6	7	8	9	10
	not much			**a little**				**a great deal**		
16. How important is it to you that he/she show you affection? affection?	1	2	3	4	5	6	7	8	9	10
	not much			**a little**				**a great deal**		
17. How important is your relationship with him/her in your life?	1	2	3	4	5	6	7	8	9	10

12.4 THE DYADIC ADJUSTMENT SCALE: A SELF-TEST

Most persons have disagreements in their relationships. Indicate the approximate extent of agreement or disagreement between you and your partner for each item. A total of 218 married persons and divorced persons initially completed this 32-item scale. The average score for married persons was 114.8 and 70.7 for divorced persons. These scores will provide a basis to evaluate your current relationship.

5	4	3	2	1	0
Always Agree	**Almost Always Agree**	**Occasionally Disagree**	**Frequently Disagree**	**Almost Always Disagree**	**Always Disagree**

1	Handling family finances	5	4	3	2	1	0
2	Matters of recreation	5	4	3	2	1	0
3	Religious matters	5	4	3	2	1	0
4	Demonstrations of affection	5	4	3	2	1	0
4	Demonstrations of affection	5	4	3	2	1	0
5	Friends	5	4	3	2	1	0
6	Sex relations	5	4	3	2	1	0
7	Conventionally (correct or proper behavior)	5	4	3	2	1	0
8	Philosophy of life	5	4	3	2	1	0
9	Ways of dealing with parents or in-laws	5	4	3	2	1	0
10	Aims, goals, and things believed important	5	4	3	2	1	0
11	Amount of time spent together	5	4	3	2	1	0
12	Making major decisions	5	4	3	2	1	0
13	Household tasks	5	4	3	2	1	0

14	Leisure time interests and activities	5	4	3	2	1	0
15	Career decisions	5	4	3	2	1	0

THE DYADIC ADJUSTMENT SCALE: A SELF-TEST / cont..

0	1	2	3	4	5
All the time	**Most of the time**	**More often than not**	**Occasionally**	**Rarely**	**Never**

16	How often do you discuss or have you considered divorce, separation, or terminating your relationship?	0	1	2	3	4	5
17	How often do you or your mate leave the house after a fight?	0	1	2	3	4	5
18	In general, how often do you think that things between you and your partner are going well?	0	1	2	3	4	5
19	Do you confide in your mate?	0	1	2	3	4	5
20	Do you ever regret that you married? (*or lived together*)	0	1	2	3	4	5
21	How often do you and your partner quarrel?	0	1	2	3	4	5
22	How often do you and your mate get on each other's nerves?	0	1	2	3	4	5

4	3	2	1	0
Every day	**Almost Every Day**	**Occasionally**	**Rarely**	**Never**

23	Do you kiss your mate?	4	3	2	1	0
24	Do you and your mate engage in outside interests together?	4	3	2	1	0

How often would you way the following events occur between you and your mate?

0 **Never**	1 **Less than once month**	2 **Once or twice month**	3 **Once or twice a week**	4 **Once a day**	5 **More often**

25	Have a stimulating exchange of ideas	0	1	2	3	4	5
26	Laugh together	0	1	2	3	4	5
27	Calmly discuss something	0	1	2	3	4	5
28	Work together on a project	0	1	2	3	4	5

These are some things about which couples sometimes agree and sometimes disagree. Indicate if either item caused differences of opinions or were problems in your relationship during the past few weeks.

		Yes	**No**
29.	Being too tired for sex.	0	1
30.	Not showing love.	0	1

31. The dots on the following line represent different degrees of happiness in your relationship. The middle point, "happy," represents the degree of happiness for most relationships. Please circle the dot which best describes the degree of happiness, all things considered, of your relationship.

0	1	2	3	4	5	6
Extremely *Un*happy	**Fairly *Un*happy**	**A Little *Un*happy**	**Happy**	**Very Happy**	**Extremely Happy**	**Perfect**

32. Which of the following statements best describes how you feel about the future of your relationship?

5	I want desperately for my relationship to succeed, and *would go to almost any length* to see that it does.
4	I want very much for my relationship to succeed, and *will do all I can* to see that it does.
3	I want very much for my relationship to succeed, and *will do my fair share* to see that it does.
2	It would be nice if my relationship succeeded, but *I can't do much more than I am doing now* to help it succeed
1	It would be nice to see it succeed, but *I refuse to do any more than I am doing now* to keep the relationship going
0	My relationship can never succeed, and *there is no more that I can do* to keep the relationship going.

12.5 COUPLES SATISFACTION INDEX (CSI-16)

1. Please indicate the degree of happiness, all things considered, of your relationship:

Extremely Unhappy	Fairly Unhappy	A Little Unhappy	Happy	Very Happy	Extremely Happy	Perfect
0	**1**	**2**	**3**	**4**	**5**	**6**

2. In general, how often do you think that things between you and your partner are going well?

All the time	Most of the time	More often than not	Occa-sionally	Rarely	Never
5	4	3	2	1	0

	Not at all TRUE	A little TRUE	So me-what TRUE	Mostly TRUE	Almost Completely TRUE	Compl e-tely TRUE
3. Our relationship is strong	0	1	2	3	4	5
4. My relationship with my partner makes me happy	0	1	2	3	4	5
5. I have a warm and comfortable relationship with my partner	0	1	2	3	4	5
6. I really feel like **part of a team** with my partner	0	1	2	3	4	5
7. How rewarding is your relationship with your partner?	0	1	2	3	4	5

8. How well does your partner meet your needs?	0	1	2	3	4	5
9. To what extent has your relationship met your original expectations?	0	1	2	3	4	5
10. In general, how satisfied are you with your relationship?	0	1	2	3	4	5

For each of the following items, **select** the answer that best describes ***how you feel about your relationship***. Base your responses on your first impressions and immediate feelings about the item.

1.	1	INTERESTING	5	4	3	2	1	0	BORING
2.	1	BAD	0	1	2	3	4	5	GOOD
3.	1	FULL	5	4	3	2	1	0	EMPTY
4.	1	STURDY	5	4	3	2	1	0	FRAGILE
5.	1	DISCOURAGING	0	1	2	3	4	5	HOPEFUL
6.	1	ENJOYABLE	5	4	3	2	1	0	MISERABLE

The Female Sexual Satisfaction Index-6

How would you rate your **level** (degree) of sexual desire or interest?

Very high

High

Moderate

Low

Very Low or none at all

How would you rate your **level** of sexual arousal ("turn on") during sexual activity or intercourse?

No sexual activity

Very high

High

Moderate

Low

Very low or none at all

How **often** did you become lubricated ("wet") during sexual activity or intercourse?

No sexual activity

Almost always or always

Most times (more than half the time)

Sometimes (about half the time)

A few times (less than half the time)

Almost never or never

When you had sexual stimulation or intercourse how **often** did you reach orgasm?

No sexual activity

Almost always or always

Most times

Sometimes

A few times

Almost never or never

How satisfied have you been with your overall sexual life?

Very satisfied

Moderately satisfied

About equally satisfied and dissatisfied

Moderately dissatisfied

Very Dissatisfied

How **often** did you experience pain or discomfort during vaginal penetration?

Did not attempt intercourse

Almost never or never

A few times

Sometimes

Most times

Almost always or always

APPENDIX: TABLES RELEVANCE FOR CLINICAL PRACTICE (SYSTEMATIC REVIEW)

	Design/ Sample	**Main Outcome Measures**	**Aims**	**Correlates Tested**	**Psychological Results**	**Effect Size**	**Correlation Coefficient**
DoĞAn, (DoĞAn et al., 2018)	Observational, exploratory study 70 women with lifelong **vaginismus**, 70 women with **dyspareunia** and 70 women without painful sexual activity	Structured Assessment Questionnaire, Golombok-Rust Sexual Satisfaction Scale, and Vaginal Penetration Cognition Questionnaire (VPCQ).	To compare vaginal penetration cognitions and general sexual function in women with vaginismus and dyspareunia and healthy controls.	Vaginal penetration cognitions and general sexual function.	vaginismus group have the highest , followed by the dyspareunia group, cognitive scores of loss of control during penetration, lower level of sexual knowledge, negative self-cognitions, catastrophic/pain and genital incompatibility cognitions have more anorgasmia, non-sensuality and sexual dysfunctions than healthy controls.	Loss of control during penetration: vaginismus: d=2.083; dyspareunia: 1.79 Pain Catastrophizing: vaginismus: d=1.29; dyspareunia: 1.4 Self-image: vaginismus: d=0.89; dyspareunia: d=0.98 Genital Incompatibility cognitions: vaginismus: d=0.41; dyspareunia: 0.30	r=0.95 Shared variance 90% between vaginismus and dyspareunia groups

	Design/ Sample	Main Outcome Measures	Aims	Correlates Tested	Psychological Results	Effect Size	Correlation Coefficient
Melles, (Melles et al., 2016)	Observational, experimental study lifelong **vaginismus** (n = 37), **dyspareunia** (n =29), and a no-symptoms comparison group (n =51).	Single Target Automatic Association task (st-IAT) Visual Search Task FSFI completed a visual search task to assess attentional bias, and single target implicit-association tests to measure automatic sex-threat and sex-wanting associations	To show (1) heightened attention for pain and sex, and (2) heightened threat and lower incentive associations with sexual penetration. attentional bias and dysfunctional automatic threat/incentive associations.	Attention for pain and sex, threat and incentive associations with sexual penetration.	There were no group differences in attentional bias or automatic associations. Women were overall faster to detect pain and sex targets than neutral targets; faster to detect a neutral target in an array of pain stimuli Slowed detection of sex stimuli and stronger automatic threat associations were related to lowered sexual arousal. No differences between groups for attentional bias, automatic associations and sexual arousal The findings do not corroborate the view that attentional bias for pain or sex contributes to coital pain, or that differences in coital avoidance may be explained by differences in attentional bias or automatic threat/incentive associations. However, the correlational findings are consistent with the view that automatic threat associations and impaired attention for sex stimuli may interfere with the generation of sexual arousal.	Coitus attempts: ηp^2 = 0.2 Arousal (FSFI) ηp^2 = 0.6 Target pain: ηp^2 = 0.04 (vaginismus d= 0.29; dyspareunia d= 0.45) Target Sex: ηp^2 =0.16 (vaginismus d= 0.19; dyspareunia d= 0.29) Distractor Pain ηp^2 = 0.06 (vaginismus d= 0.50; dyspareunia d= 0.31)	r=0.47 between dyspareunia and vaginismus groups Shared Variance: 22%

	Design/ Sample	Main Outcome Measures	Aims	Correlates Tested	Psychological Results	Effect Size	Correlation Coefficient
Huijding, (Huijding et al., 2011)	Experimental, separate ANOVA-s with diagnosis as the in-between subject factor Dyspareunia group (N=23) Vaginismus (N=24) and control (N=30)	EAST picture sorting visual test (to record global automatic affective appraisals of sexual penetration and to test whether the three groups of women made different automatic appraisals of the sexual penetration stimuli compared with the neutral stimuli. VAS self-report measure to test whether there were differences in the self-reported appraisals of the sexual penetration	To establish whether negative automatic affective appraisal responses can differentiate between vaginismus and dyspareunia To test whether sexual penetration pictures elicited global negative automatic affective appraisals in women with vaginismus and dyspareunia. To examine whether deliberate appraisals and automatic appraisals differed between the two patient groups.	negative appraisals of sexual stimuli: global negative automatic affective appraisals and deliberate negative affective appraisals. Disgust response	Automatic affective appraisals of sexual penetration stimuli tended to be positive, independent of the presence of sexual complaints. Deliberate appraisals of the same stimuli were significantly more negative in the women with vaginismus than in the dyspareunia group and control group, while the latter two groups did not differ in their appraisals Women with vaginismus had lower scores of self-reported penetration than women with dyspareunia and controls. Unexpectedly, *deliberate appraisals seemed to be most important in vaginismus.* The women with vaginismus also showed this disgust response on a unique physiological marker of disgust (i.e., activity of the levator labii muscle). unlikely that global negative automatic appraisals are involved in the defensive responses that characterize vaginismus	Pair-wise comparison of deliberate negative appraisal in women with vaginismus vs controls $\eta p^2 =$ 0.18; d=0.712 and dyspareunia and controls d=0.030	r=? P< 0.01

	Design/ Sample	Main Outcome Measures	Aims	Correlates Tested	Psychological Results	Effect Size
Melles, (Melles et al., 2014)	Observational lab study with symptomatic group and control group vaginismus (N = 68) and women without sexual problems (N = 70) The vaginismus group was randomly allocated to exposure treatment (= 34) and a waiting list control condition (n = 34).	Indices of automatic threat were obtained by the st-IAT and automatic global affective associations by the Affective Simon Task (AST), visual analogue scales (VAS) were used to assess deliberate appraisals of the sexual pictures (fear and global positive affect).	To investigate whether automatic threat associations and more global negative associations with vaginal penetration stimuli are involved in vaginismus.	Threat associations with vaginal penetration, negative global (automatic and deliberate) affective associations with vaginal penetration and erotic stimuli	Women with vaginismus slower reacting overall. All participants were faster when there was a match between the emotional valence of the picture and the valence of the required response, especially positive pictures (d=0.95). More deliberate fear and less global positive affective associations with sexual stimuli were found in women with vaginismus. Following therapist-aided exposure treatment, the strength of fear was strongly reduced, whereas global positive affective associations were strengthened.	Vaginal penetration stimuli and fear associations: d= 1.08 Main reaction time to positive stimulus: peneteration: d= 0.49 and positive sex: d= 0.53 Deliberate global affective associations of the AST to penetration stimuli d= -1.25 and non-penetration stimuli d= -0.82 Less positive affect to penetration stimuli than to non-penetration stimuli: d= -0.57 Post-treatment: Effect of exposure treatment on automatic and deliberate threat associations $\eta p^2 < 0.01$ Effect of exposure treatment on deliberate fear ratings with regard to vaginal penetration stimuli: d= 0.51 Effect of exposure therapy on global affect evaluation of penetration stimuli: d= 0.63

	Design/ Sample	Main Outcome Measures	Aims	Correlates Tested	Psychological Results
Lemieux, (Lemieux et al., 2013)	N= 179 Women with Introital dyspareunia and their partners. Cross-sectional, correlational, observational because of the cross-sectional nature of the design, a causal association	Zero-order correlations between pain intensity, sexual satisfaction, sexual functioning, and partner variables (pain catastrophizing and perceptions of women's self-efficacy) and covariates	To examine the role of partner-perceived self-efficacy and partner catastrophizing in the experience of pain, sexual functioning, and sexual satisfaction	Associations between partners' catastrophizing and their perceptions of women's self-efficacy at managing pain on one side and women's pain intensity, sexual	Higher levels of partner- perceived self-efficacy and lower levels of partner catastrophizing are associated with *decreased pain intensity* in women with entry dyspareunia, although only partner catastrophizing contributed unique variance. Neither partner- perceived self-efficacy nor partner catastrophizing significantly contribute to sexual satisfaction or sexual function Partner catastrophizing was

	between the independent and dependent variables cannot be established. Further studies should be conducted using a longitudinal methodology in order to establish temporal relations between variables.	(women's catastrophizing and self-efficacy) Dependent measures were women's responses to (i) the Pain Numeric Visual Analog Scale; (ii) the Female Sexual Function Index; and (iii) the Global Measure of Sexual Satisfaction scale.		function, and sexual satisfaction on the other.	significantly and positively correlated with women's pain intensity and catastrophizing ($r = 0.35$, $R < 0.01$) Partners' perception of the women's degree of self-efficacy with regards to her ability to manage her pain was found to correlate significantly and negatively with women's pain intensity ($r = -0.31$, $P < 0.01$) Partner catastrophizing and perceptions of women's self-efficacy explained 31.1% of the variance in the pain intensity of women with entry dyspareunia, with 7.5% accounted for by partner variables

	Design/ Sample	**Main Outcome Measures**	**Aims**	**Correlates Tested**	**Psychological Results**
Both, (Both et al., 2017)	A differential conditioning experiment, (the CS) paired with a painful unconditional stimulus and one erotic picture never paired with pain (the CS). During the preconditioning and extinction phases, ratings of subjective affect and subjective sexual arousal were collected.	Genital sexual response was measured by vaginal photoplethysmography, Other Measures: FSFI, FSDS, STAI, Sexual and Physical Abuse Questionnaire, SCL-90, PVAQ, SESII-W	To test whether learned associations between pain and sex negatively affect sexual response; whether women with dyspareunia show stronger aversive learning; and whether psychological distress, pain-related anxiety, vigilance, catastrophizing, and sexual excitation and inhibition were associated with conditioning effects.	the effects of aversive pain conditioning on sexual arousal and affect in women with dyspareunia and sexually functional controls.	Women with dyspareunia expected more strongly to receive the pain stimulus at presentation of the "safe" stimulus, the stimulus that was never paired with pain ($\eta p^2 = 0.08$) Women with dyspareunia showed, as expected, higher levels of anxiety, pain catastrophizing, and sexual inhibition, but, in contrast to expectations, pain catastrophizing and sexual inhibition were associated with weaker differential aversive conditioning effects. ($P < .05$.)

					There was no stimulus trial interaction, indicating no extinction of the conditioned affective response, which was confirmed by the observation of a significant lower affect rating ($P < .001$, partial $\eta p^2 = 0.17$).

	Design/ Sample	**Main Outcome Measures**	**Aims**	**Psychological Results**
Brom, (Brom et al., 2015) **Exclude?**	N=38 men and N=34 women Experimental design A differential conditioning experiment was conducted, with two erotic pictures as conditioned stimulus (CSs) and a painful stimulus as unconditioned stimuli (USs). Only one CS (the CS+) was followed by the US during the acquisition phase. Conditioned responses were assessed during the extinction phase.	Physiological Measures of subjective arousal Approach Avoidance Task (AAT). After the extinction phase, participants performed the implicit approach/avoidance task Psychological Measures: International Index of Erectile Function (IIEF). FSFI	To study resistance to extinction of aversive conditioned sexual responses in sexually functional men and women.	Diminished genital arousal and positive affect toward erotic stimuli due to aversive classical conditioning did not extinguish during an extinction phase. In accordance with the expectations, women's genital blood flow in the extinction phase was attenuated in response to the erotic picture that was previously paired with the painful electric stimulus (the CS+) as compared with the erotic picture that was never paired with the US (the CS−). However, no such CR in men was detected.

	Design/ Sample	**Main Outcome Measures**	**Aims**	**Correlates Tested**	**Psychological Results**
Hosseini, (Hosseini et al., 2017)	Observational, Case-control study N= 50 UCM (unconsummated marriage) women and n= 100 case control group with no symptoms	Multidimensional Body-Self Relations Questionnaire (MBSRQ).	To determine the relation between women's body image and unconsummated marriage.	Body Image and its components	Body image and its components are not significantly related to UCM. It seems that in Iranian culture, religious beliefs and traditions are strong levers in shaping the people's sexual behaviors

	Design/ Sample	Main Outcome Measures	Aims	Correlates Tested	Psychological Results
Turan, (Turan et al., 2020)	Observational study	Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI), Golombok Rust Inventory of Sexual Satisfaction (GRISS), and TEMPS-A	To investigate depression and anxiety levels, sexual dysfunctions, and affective temperament characteristics of both women with LLV and their male partners.	Anxiety, depression, sexual satisfaction, affective temperament rates (associations between LLV and the BDI, BAI, GRISS, and TEMPS-A scores.)	Women with LLV had higher risk to develop anxiety and depression and had more sexual dysfunctions except for avoidance than those of female controls. (odds ratio [OR] =1.19; 95% CI = 1.09) and anxiety (OR = 1.14; 95% CI =1.07-1.23) hyperthymic temperament in male partners of women with LLV and anxious and depressive temperament in women with LLV have a negative effect on their own sexual functions, including pain sensitivity (β = 0.27; β= 0.38, respectively) In terms of partner effect, it was found that men with hyperthymic temperament had a negative effect on the sexual functions of women with LLV and men with depressive temperament had a positive effect.

	Design/ Sample	Main Outcome Measures	Aims	Psychological Results	Effect Size	Corr .Coeff.
Brauer, (Brauer et al., 2014)	Observational study: Dyspareunia N=50; vaginismus N=20 and pain-free controls Vaginismus:	Motives for intercourse; sexual autonomy; maladaptive beliefs regarding vaginal penetration; partner responses to pain and sexual pain behavior	To identify factors that are related to task-persistent pain behavior (i.e., continuing painful intercourse) in women with dyspareunia and fear-avoidant pain behavior in women with	Compared with controls, women with dyspareunia displayed less pleasure motives and more "duty" and mate guarding motives for sex, and less sexual autonomy. Task persistent motives.	Control cognitions Dyspareunia d=-1.36 Vaginismus d= -2.3 Catastrophic and pain cognitions Dyspareunia d= 2.54 Vaginismus d= 4.8	r= 0.929

	never had been able to have vaginal intercourse (i.e., full penile insertion and thrusting) despite attempts on at least five separate occasions and an explicit wish to do so.	and partner solicitousness as outcome measure. General autonomy was assessed with the Autonomy-Connectedness Scale (ACS-30) Multidimensional Pain Inventory- Significant Other Response Scale (MPI-SORS)	vaginismus To examine whether women with sexual pain disorders (SPD) differ from pain-free controls in motives for sexual intercourse, sexual autonomy, maladaptive beliefs regarding vaginal penetration, and partner responses to pain; and which of these factors best predict whether women with SPD stop or continue painful intercourse (attempts).	The limited sexual repertoire of women with dyspareunia is possibly a result of women's fear that non-penetrative activities will lead to painful intercourse. Qualitative data reveal that a woman with dyspareunia may avoid, for fear of penetration, non-penetrative sexual activities because they feel that once intimacy has started, or once their partner has an erection, they cannot say "no" to penetration	Self-image cognitions Dyspareunia d= 1.34 Vaginismus d= Positive cognitions Dyspareunia d= -1.64 Vaginismus d=-1.4 Genital incompatibility cognitions Dyspareunia d=0.79 Vaginismus d= 1.6 MPI-SORS women Solicitous responses Negative d=?	

	Design/ Sample	**Main Outcome Measures**	**Aims**	**Correlates Tested**	**Psychological Results**
Maseroli, (Maseroli et al., 2017)	exploratory and cross-sectional nature; retrospective analysis of a consecutive series Lifelong and acquired cases of V were considered. To assess the impact of several parameters on V, patients with V (n =20) were compared with controls selected from the same cohort at a 1:3 ratio. a structured interview and physical, gynecologic, laboratory, and	FSFI, the Middlesex Hospital Questionnaire (MHQ), the Female Sexual Distress Scale Revised (FSDS), and the Body Uneasiness Test (BUT).	To investigate, in a cohort of subjects consulting for female sexual dysfunction (FSD), whether there is a difference in medical and psychosocial parameters between women with vaginismus (V) and women with other sexual complaints. The aim of this exploratory study was to investigate, in a cohort of subjects consulting for female sexual dysfunction (FSD),	Psychosocial correlates clinical, biological, psychological, sexual, and clitoral	No differences were found for traditional risk factors such as a history of sexual abuse, relational parameters, or gynecologic diseases or for newly investigated parameters (ie, neurologic, hormonal, metabolic alterations). r= 0.996 with relationship and psychiatric factors Women with V showed significantly higher histrionic-hysterical symptoms and traits (as detected by MHQ-H score) compared with subjects with other sexual complaints). d=0.663. V was associated with FSFI pain domain, and sex-related distress. Free-floating anxiety d= 0.173 Phobic Anxiety d= 0.038 OCD d= 0.060 Depressive Symptoms d= -0.031did not find a higher prevalence of sexual abuse history with VTotal MHQ-S d=0.233 No observed association between V and somaticized anxiety (MHQ-S) or body

	clitoral ultrasound examinations		whether there is a difference in organic and psychosocial parameters between women with V women with other and sexual complaints.		uneasiness. Even when BUT-A depersonalization subscale was considered specifically exploring detachment and estrangement feelings toward one's own body, no association with V was found. No significant relationship between V and the presence of conflicts within the couple or perceived sexual dysfunction in the male partner; therefore, it seems that relational parameters are not associated with V, in contrast to what was observed for other FSDs.

	Design/ Sample	**Main Outcome Measures**	**Aims**	**Correlates Tested**	**Psychological Results**	**Correlation Coefficient**
KaragÜZel (KaragÜZel et al., 2016)	Cross sectional, descriptive Questionnaire study The participants were women with vaginismus without any organic pathology in gynecological examination and healthy controls. Twenty-five women with vaginismus and 25 controls who have no difficulty with vaginal penetration were evaluated by self-reported scales for depression, anxiety and sexual function. Sociodemographic variables were collected for each participants.	Golombok-Rust Sexual Satisfaction Scale	The purpose of this cross-sectional, descriptive study was to investigate sociodemographic variables, depression and anxiety levels, sexual function, level of sexual knowledge and history of physical or sexual trauma in patients with v	Anxiety, depression satisfaction, avoidance, anorgasmia and level of sexual knowledge was also limited	Women with vaginismus did not differ from controls in sociodemographic characteristics. The women with vaginismus had significantly higher levels of depression and anxiety. BDI d= 3.622 BAI d= 1.346 satisfaction, avoidance, anorgasmia were significantly higher and level of sexual knowledge was also limited GRISS total score d= 1.618 Frequency d= 0.42 Communication d= 0.131 Satisfaction d= 1.046 Avoidance d= 1.063 Sensuality d= 0.239 Vaginismus d= 2.903 anorgasmia d= 0.911 In this study, neither women with vaginismus nor the healthy controls had any history of sexual abuse.	Depression and anxiety scores were modestly correlated with GRSSS total score Correlation of BDI and BAI at $p<0.001$ Satisfaction r= 0.598 and r= 0.521 Avoidance r= 0.543 and r= 0.552 Sensuality r= 0.398 at $p<0.020$ and r= 0.398 at $p<0.04$ Anorgasmia r= 0.473 and r= 0.412 Total GRISS r= 0.589 and 0.522

	Design/ Sample	Main Outcome Measures	Aims	Psychological Results
Borg, (Borg et al., 2010)	Experimental Two single target Implicit Association Task (st-IAT) and electromyography (EMG) were conducted on three groups: vaginismus (N = 24), dyspareunia (N = 24), and control (N = 31) group.	st-IAT, to index their initial disgust-related associations and facial EMG for the m. levator labii and m. corrugator supercilii regions.	To examine if sex stimuli specifically elicit: (i) automatic disgust-related memory associations; (ii) physiological disgust responsivity; and/or (iii) deliberate expression of disgust/threat. The major aim of this study is to investigate further, whether disgust is indeed involved in vaginismus, by examining if, specifically, women with vaginismus elicit (i) automatic and/or deliberate disgust-related associations; and/or (ii) facial expressions of disgust during the presentation of pictures and a film clip having penetration content.	Both vaginismus and dyspareunia groups showed enhanced automatic sex-disgust associations ($P < 0.05$). The difference between the clinical groups was not significant ($P > 0.20$) .As a unique physiological expression of disgust, the levator activity was specifically enhanced for the vaginismus group, when exposed to a women- friendly SEX video clip. . All groups were characterized by a similar responsivity to disgust and/or threat stimuli to non-sexual general stimuli. Vaginismus group was not uniquely characterized by a generalized enhanced responsivity to threat or disgust. $F(1, 69) = 1.79$, $P = 0.18$. Vaginismus group showed significantly higher subjective threat than controls (M = 22.36; SD = 6.66, $P < 0.05$ [95% CI: 35.6–9.09]) . At the deliberate level, specifically the vaginismus group showed enhanced subjective disgust toward SEX pictures and the SEX clip, along with higher threat responses. The vaginismus group differed significantly from the dyspareunia group (M = 20.7; SD = 8.44, $P < 0.05$ [95% CI: 3.89–37.5]) and controls (M = 17.72; SD = 7.90, $P < 0.05$ [95% CI: 31.46 to 0.0085]) . Women with vaginismus or dyspareunia showed enhanced automatic associations between sex and disgust; (ii) Specifically women with vaginismus also showed heightened levator activity when exposed to an erotic clip; (iii) The vaginismus group showed enhanced subjective disgust along with threat; (iv) Exposure to slides depicting penetration did not result in a differential pattern in levator activity, whereas specifically women with vaginismus again showed increased subjective disgust; and (v) There was no evidence indicating that women with vaginismus are characterized by a generalized amplified levator and/or subjective responsivity to disgust and/or threat stimuli.

	Design/ Sample	Main Outcome Measures	Aims	Correlates Tested	Psychological Results
Pâquet, (Pâquet et al., 2016)	Observational questionnaire study Women diagnosed with PVD (N = 50) and their partners completed questionnaires of perceived injustice, pain, sexual satisfaction, sexual distress, and depression.	(1) Global Measure of Sexual Satisfaction Scale; (2) Female Sexual Distress Scale; (3) Beck Depression Inventory-II; and (4) McGill Melzack Pain Questionnaire.	To investigate the associations between perceived injustice and pain, sexual satisfaction, sexual distress, and depression among women with PVD and their partners.	Perceived Injustice, pain, sexual satisfaction, sexual distress and depression	After controlling for partners' age, women's higher level of perceived injustice was associated with their own greater sexual distress and depression (β= 0.42, P =.003) and β= 0.42, P = .004), respectively. Perceived injustice was not associated with women's pain intensity. (β =0.23, P = .10)

	Design/ Sample	Main Outcome Measures	Aims	Correlates Tested	Psychological Results
Bairstow, (Bairstow et al., 2018)	Phenomenological study (qualitative interviews)	N/A	Patient's history, the impact of the inability to have PVI on their relationship, the experience of the inability to have PVI, the meaning of sex, getting help, the experience of participating in the study.	N/A	3 themes emerged from the study: Shame and Embarrassment, Invisibility, and Centrality of PVI. Early Learning, First Attempts at Penetration, PVI Attempts, Life Without PVI, Looking for Support, and Attempting Treatment.

	Design/ Sample	Main Outcome Measures	Aims	Correlates Tested	Psychological Results
Cherner, (Cherner & Reissing, 2013)	Experimental design, designed to provide initial data evaluating genital arousal using thermography along with an investigation of subjective responses to erotic stimuli in women with lifelong vaginismus compared with women with lifelong dyspareunia and women with no genital pain. N=15 women with vaginismus N=15 women with dyspareunia N=15 women with no pain	Interview, including items from the Sexual and Physical Abuse Interview Genital arousal (vulvar temperature was recorded using an infrared camera) Participants completed a measure of subjective responses after viewing each film.	To examine the genital and subjective responses to sexually explicit film stimuli of women with lifelong vaginismus compared with women with lifelong dyspareunia and women with no pain.	Genital and subjective responses	In response to the erotic films, the vaginismus group reported less mental arousal than the no-pain group and a range of negative subjective responses, including threat and disgust. ($P < 0.05$). .Worry, $F[2, 39] = 20.68$, $P < 0.001$, $\eta p^2 = 0.52$, d= 1.96; disgust, $F[2, 29] = 13.08$, $P < 0.001$, $\eta p^2 = 0.40$, d=1.42; and threat, $F[2, 39] = 9.29$, $P = 0.001$, $\eta p^2 = 0.32$), d=1.13. . Women with vaginismus ($P < 0.001$) and dyspareunia ($P = 0.001$) reported more anxiety to penetration films than the control group, (V.: d=1.86; D.: d=1.64); suggesting that anxiety interferes with arousal during sexual encounters. The vaginismus group endorsed higher ratings of worry ($P < 0.001$), disgust (dyspareunia $P < 0.01$; no-pain $P < 0.001$), and threat (dyspareunia $P < 0.01$; no-pain $P = 0.001$) than the other groups Thermography results indicate that women with vaginismus exhibited genital arousal similar to both comparison groups regardless of whether erotic films depicted penetration or not. However, their vulval temperature change did not correlate with peak sexual arousal for women with vaginismus or dyspareunia. However, for women with no pain, peak sexual arousal ($r[13] =$

					0.55, *P* < 0.05) correlated with temperature change from baseline to peak arousal during the no-penetration film. Symptomatic women respond with genital arousal to varied erotic stimuli, including those that are rated as less subjectively arousing These results suggest that genital arousal is not impaired, at least within a laboratory setting.

	Design/ Sample	**Main Outcome Measures**	**Aims**	**Correlates Tested**	**Psychological Results**
	Observational, questionnaire Women with PVD and their partners	Childhood Trauma Questionnaire (CTQ) , FSFI, CSI, STAI-T , MPQ-SF	To examine the associations between childhood maltreatment reported by women with PVD and their partners, and their sexual, relational, and psychological functioning, as well as women's pain during intercourse.	Associations between childhood maltreatment and sexual and psychosocial functioning and pain in women with PVD.	Women's higher reports of childhood maltreatment were associated with their lower sexual functioning and higher anxiety (r=-0.32 and r=0.30, respectively). Childhood maltreatment was associated with only affective pain but not genital sensory pain during sexual intercourse (r=0.37 and 0.08 respectively) Both women's and men's greater child- hood maltreatment was associated with more severe affective reports of pain during intercourse (B = 0.39, t (48) = 3.08, p < 0.01).

	Design/ Sample	Main Outcome Measures	Aims	Correlates Tested	Psychological Results
Govind (Govind et al., 2020)	Retrospective chart review N=79 women with PVD with associated overactive pelvic floor muscle dysfunction (PVD-PFD).	PASS-20 PHQ-8	To determine the prevalence of pain-related anxiety and depression in patients with a diagnosis of vestibulodynia with associated overactive pelvic floor dysfunction (PVD-PFD). To explore the role of previous treatments in the rate of pain-related anxiety and depression.	Anxiety, depression and success of previous treatments.	49% of women with PVD-PFD experienced pain- related anxiety, with or without depression. There was a statistically significant association between anxiety and depression within the patients, $\chi^2(1) = =21.435$, $P < 0.0005$. There was a very strong association between anxiety and depression in these patients, phi= =0.521, P < 0.0005. There was a statistically significant association between anxiety and/or depression and whether prior treatment was attempted χ^2 (2) 1⁄4 6.81, P = .03, phi = 0.294

	Design/ Sample	Main Outcome Measures	Aims	Correlates Tested	Psychological Results
Devitte (Dewitte & Kindermans, 2021)	Experimental Women with pain N=30 Women without pain N=29	Relational Responding Task explicit ratings of the actual and the ideal sexual self; and measurements of sexual self-esteem, global self-esteem, depression, sexual satisfaction, sexual distress or	To explore the role of the concept of the sexual self in the context of genital pain by measuring different states of self (ie, actual vs ideal) at different levels of responding (ie,	Actual and ideal sexual self-concept	Women with genital pain scored lower on the explicit and implicit actual-self measurements than women without pain but did not differ in their ideal self ($t_{1,57} =-2.39$ $P < .05$) High Pain and Low Pain groups: Sexual Self Esteem d= -0.50 Global Self Esteem d= -0.15

		depression, sexual frequency, and pain experiences.	explicit vs implicit) and examine their associations with sexual, emotional, and pain-related variables.		Depression d= 0.41 Sexual Satisfaction d= -0.59 Sexual Frequency d= 0.79 Sexual Depression d= 1.1 Pain Fear of Pain Pain Behavior

	Design/ Sample	**Main Outcome Measures**	**Aims**	**Correlates Tested**	**Psychological Results**
Pazmany 2013 (Pazmany, Bergeron, Van Oudenhove, et al., 2013)	Women with Self-reported dyspareunia N=231	Vaginal Penetration and Cognition Questionnaire (VPCQ), only the subscale "self-image cognitions" was used. State–Trait Anxiety Inventory (STAI) Pain Cognition List FSFI, FSDS (Dutch version) Female Genital Self-Image Scale (FGSIS)	To examine whether aspects of sexual self-schema are associated with pain, sexual functioning, and sexual distress in women with dyspareunia, above and beyond the contribution of anxiety and catastrophizing.	Dependent variables (pain, sexual functioning, and sexual distress) and independent variables (self-image cognitions about vaginal penetration, body image, and genital self-image)	Negative cognitions about one self is positively associated with pain (r=0.32) Trait anxiety and genital pain are not significantly correlated (r= 0.05) Body image and pain and genital self-image and pain (r=0.19 and r=0.04 respectively) Worry about penetration modulates pain intensity more than body image or image of genitals Only self-image cognitions about vaginal penetration (b = 0.25, *P* = 0.005) contributed uniquely to the variance in pain intensity, whereas self-image cognitions about vaginal penetration (b = -0.18, *P* = 0.048) and genital self-image (b = 0.21, *P* = 0.008) contributed independently to the variance in sexual functioning.

	Design/ Sample	Main Outcome Measures	Aims	Correlates Tested	Psychological Results
Pazmany (Pazmany et al., 2014)	Observational, online survey study Women with self-reported dyspareunia N=38 and their partners N=44 controls	DSC, DAS, STAI, Beck-Depression Inventory-II, FSDS, IIEF,	To compare dyadic sexual communication, dyadic adjustment, psychological adjustment, and sexual well-being of women with self-reported dyspareunia and their partners with those of pain-free control women and their partners.	dyadic sexual communication; dyadic adjustment, anxiety, depression, sexual functioning; and women's sexual distress	Women with dyspareunia reported significantly poorer dyadic sexual communication. No differences in dyadic adjustment were found between women with dyspareunia and pain-free control women, or between their respective partners. Dyadic sexual communication (DSC) ηp^2 =0.08 Dyadic adjustment (DAS)= not significantly different Anxiety (STAI-Trait) ηp^2 =0.10 Depression (BDI) ηp^2 =0.05 Sexual functioning (FSFI/IIEF) ηp^2 =0.44 Female sexual distress (FSDS) ηp^2 =0.34

LIST OF PUBLICATIONS

Witherow MP, Chandraiah S, Seals SR, Bugan A. Relational Intimacy and Sexual Frequency: A Correlation or a Cause? A Clinical Study of Heterosexual Married Women. *Journal of Sex & Marital Therapy* 2016; **42**: 277-86. (Impact Factor: **1.842**)

Witherow MP, Chandraiah S, Seals SR et al. Relational Intimacy Mediates Sexual Outcomes Associated with Impaired Sexual Function: Examination in a Clinical Sample. *Journal of Sexual Medicine* 2017; **14**: 843-851 (Impact Factor ~ **3.151**)

Witherow MP. Female Sexual Interest/Arousal Disorder: History Of Diagnostic Considerations And Their Implications For Clinical Practice. PSYCHIATRIA HUNGARICA; article accepted …

Total IF of journals (all publications): **4.99**

Total IF of journals (publications related to the dissertation): **~4.99**

KEYWORDS

Female Sexual Dysfunction
Psychology of Close Relationships
Marital Intimacy
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Bio-psychosocial Psychiatry
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ANNEX: PUBLICATIONS RELATED TO THE THESIS

Witherow MP, Chandraiah S, Seals SR, Bugan A. Relational Intimacy and Sexual Frequency: A Correlation or a Cause? A Clinical Study of Heterosexual Married Women. *Journal of Sex & Marital Therapy* 2016; **42**: 277-86. (Impact Factor: **1.842**)

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I. The data of the doctoral dissertation:

Name of the author: Marta Párkányi Witherow

MTMT-identifier: 10070211

Title and subtitle of the doctoral dissertation: FEMALE SEXUAL DYSFUNCTION IN THE CONTEXT OF MARITAL INTIMACY

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Name of the doctoral school: PSYCHOLOGY

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Name and scientific degree of the supervisor: RÓBERT URBÁN, PhD; ZSOLT DEMETROVICS, PhD

Workplace of the supervisor: EÖTVÖS LORÁND UNIVERSITY

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