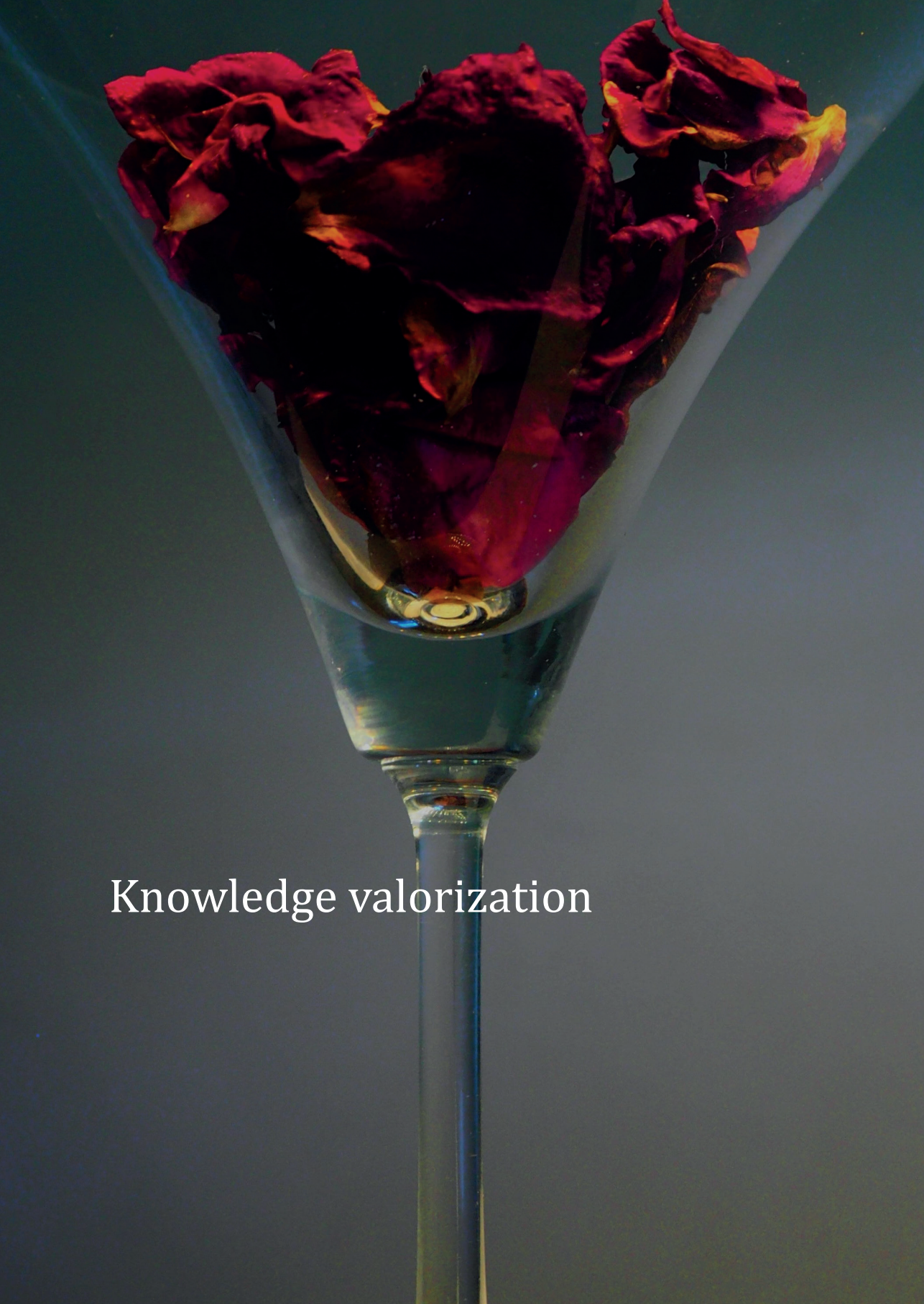
Vaginal penetration: pain or pleasure?



Knowledge valorization

KNOWLEDGE VALORIZATION

This dissertation focuses on psychological risks and resilience factors related to painful or pleasurable vaginal penetration. In this valorization paragraph I will describe how the obtained knowledge from our research can be made valuable for clinical and social use. I will start with discussing the relevance of the project, by describing the target groups for whom it is relevant and possible activities and products. Subsequently, I will discuss the innovative character of these possible activities and products and how they can be implemented.

Relevance

Chronic genital pain can be considered as a social problem in view of the high prevalence rates, (5 to 9 % [3]), the psychological impact on women and their partners and the barriers for adequate health care. Many women with self-reported genital pain never seek treatment [5]. In the Netherlands, only 37% of women who had a sexual problem and felt the need to seek help actually contacted a health professional [3]. A number of barriers to seeking help have been reported by women with genital pain including embarrassment and lack of confidence in a medical solution [20].

Genital pain remains one of most poorly understood and complex chronic pain syndromes. Yet little attention is given to this condition and it is frequently dismissed as psychosomatic [260]. Generally, 41% of women with self-reported genital pain has seen three or more health care providers and only 6% of women who contacted a clinician obtained advice or help [3]. In specialist care, as many as 15% of women who seek gynaecological care are affected by genital pain [261]. During gynaecological examination 84% of affected patients experienced increased pain and around half of the patients with genital pain show high (or very high) levels of palpated vaginal muscular tension [25]. This vaginistic reaction has a negative impact on gynaecological examination or can even preclude it. Women with vaginismus are at increased risk of a delivery by caesarean section, or, when delivering vaginally, to suffer perineal laceration [262]. Consequently, this

condition carries large costs incurred as a result of both medical treatment and lost productivity.

When confronted with women suffering from genital pain, many health care professionals feel uncomfortable about dealing with pain located in the genital area [8 263]. They also feel uncertain about treatment options, and as a result do not engage in a proactive approach [21]. These barriers result in delayed diagnosis and treatment, with deleterious consequences for sexual functioning, well-being, and relationships in women with genital pain [19].

Thus, genital pain still remains a major health problem in Western countries, leading to significant morbidity and a reduced quality of life for many women [19]. Thus, there is an urgent need for the development of expertise in genital pain. The findings of the studies reported in this thesis contribute to this.

Target groups

In addition to the academic community, the findings described in this dissertation are relevant for various target groups, namely (1) female genital pain patients and their partners, (2) healthcare providers, (3) sex educators and (4) society.

First and foremost, the results are relevant for genital pain patients and their partners. The experience of genital pain has wide-reaching consequences for affected women and their partners' psychological, sexual, and relationship well-being. The dissertation provides evidence that therapist-aided exposure treatment increases success rates from 19% to 89% [59]. Therapist-aided exposure is well protocolized and provides practical tools for affected women and their partners. This is important to increasing self-efficacy and providing a positive perspective on treatment outcome in affected couples, which is relevant given their reported lack of confidence in a medical solution.

Affected women may also profit from the Vaginal Pressure Inducer VPI, a new remotely controlled instrument suitable to apply gradually increasing introital vaginal pressure while respecting woman's privacy. The VPI may help to facilitate vaginal penetration and to learn to link vaginal pressure with sexual arousal. In view of the importance of

sexual arousal to decrease unpleasantness of vaginal pressure (this thesis), this may help to overcome genital pain. To create a positive perspective, it may help to know that sexually functional women can experience vaginal pressure as pleasurable and sexually stimulating, when it is paralleled by explicit sexual stimuli (this thesis).

The second group of stakeholders are healthcare providers. Clinicians may profit from the substantiated relevance of sexual arousal to increase pleasantness of vaginal penetration. They should not limit their focus to reducing genital pain, but should also focus on increasing sexual pleasure. Furthermore, they can focus on targeting avoidance behaviour for changing both negative associations and pain/penetration catastrophizing cognitions in genital pain patients. This knowledge may help to specify clinical interventions. This is important knowledge for sexologists, gynaecologists and pelvic floor therapists. Referring highly anxious genital pain patients for therapist-aided exposure prior to the gynaecological exam or delivery is needed to increase patient friendliness and reduce medical costs. Scheduling combination consults of trained exposure therapists together with health professionals may help to further transfer expertise in clinical practice. For this purpose, training of sexologists, gynaecologists, general practitioners and pelvic floor therapists in therapist-aided exposure is needed in the Netherlands and abroad.

Clinicians may use the VPI in women with genital pain for diagnostic and clinical interventions. The VPI may be suitable for use in counterconditioning for genital pain, by linking high levels of sexual arousal (elicited by explicit film clips) to gradually increasing levels of vaginal pressure, facilitating a positive appraisal of vaginal pressure out of the context that is associated with genital pain cues. The VPI may be useful to identify personal preferences regarding the duration of pressure/penetration along with approach-avoidance tendencies. Furthermore, the VPI may help to increase body-awareness, self-efficacy and adequate coping, which may improve treatment outcomes for genital pain [256-258].

The third group of stakeholders are sex educators. They may integrate the finding that explicit sexual arousal stimuli are important to increase pleasurableness of vaginal penetration and prevent pain. In view of the neglected attention for sexual pleasure and

the related anatomy in women, there is still much room for improvement in sex education.

Fourthly, society can profit from the obtained knowledge. Therapist-aided exposure is not only found to increase effectivity of treatment, also treatment duration can be shortened from ten sessions to three sessions. Furthermore, therapist-aided exposure may facilitate and/or prevent gynaecological interventions. The short duration of therapy increases the suitability to apply this intervention in patients needing gynaecological examination and/or interventions, for example in case of gynaecological diseases or pregnancy in women with increased anxiety. Future studies should test the expected contribution of therapist-aided exposure in medical practice.

Activities and products

The research reported in the current thesis is part of a project that has resulted in the development of therapist-aided exposure treatment. Following therapist-aided exposure 89% of the couples was able to have coitus after treatment. These rapidly reached results of therapist-aided exposure can increase the cost-effectiveness of CBT in vaginismus. Therapist-aided exposure is also likely to facilitate as well as prevent gynaecological interventions, along with the costs thereof.

Therapist-aided exposure has been described in several clinical books. Furthermore, the clinical interventions and research are presented to many medical and psychological health professionals on congresses and team visit (sexologists, psychologists, cognitive behavioural therapists and gynaecologists). Furthermore, we have developed a two-week traineeship in therapist-aided exposure treatment for a multi-disciplinary team in California. The development of therapist-aided exposure treatment and the publications and presentations have led to a critical verbal discussions and opinion papers about the treatment of vaginismus. Nowadays, therapist-aided exposure is commonly accepted and patients coming from all parts of the Netherlands, Belgium, Germany and other countries are referred to our clinics.

The VPI can be valuable in clinical practice for diagnosis and treatment and can serve as a supplement of/ or an alternative for professional help. When further developed, the VPI may be used as a self-help instrument. Given the amount of women suffering from genital pain and the lack of expert advice or assistance, a trainings program using the VPI may serve as an early-intervention program. This may preclude that acute/ incidental genital pain will turn into a chronic and "neuropathic" disease resulting in huge quantifiable and non-quantifiable costs [264]. This may lead to improvements in the psychosocial well-being of genital pain patients and their partners, which may also serve an economical interest, as it might help in reducing the direct and indirect costs associated with chronic genital pain.

The VPI may also be valuable for women who have suffered sexual abuse, in view of their high levels of fear and avoidance behaviour towards sexual encounters and the sexual problems they experience [254,255]. The VPI may help to encourage approach behaviour towards genital stimuli in women with negative experiences [265].

Furthermore, the VPI may be applicable in several groups of patients with medical diseases to facilitate or enable vaginal penetration: patients with diseases like MRKH (Maier Rokitanski Kustner Syndrome or vaginal agenesis)); patients with a physical constriction of the vagina caused by lichen sclerosis [266,267]) male to female gender confirmation surgeries, infections, vaginal narrowing/ shortening (side effect of cancer treatment, surgeries, genetic defects), injuries and auto-immune conditions (Graph vs. host diseases). In view of maintaining the accessibility of the vagina, these patients have to apply vaginal dilatation exercises. These exercises are often experienced as technical and carrying, especially because they have to start immediately after operation. Vaginal dilation using the VPI may increase patient friendliness. The combination of sexual arousal and vaginal dilation facilitates dilatation and may improve mucosal color, moisture and vaginal elasticity and decreased bleeding and ulceration in irradiated cervical cancer patients [268]. With some adaptations the VPI could be easily inserted at night whereby the balloon of the VPI gradually extends several times at the night, preferably during the rapid eye movement (REM) sleep because pain sensitivity is lower then. This may also be useful for women with a partner having a large penis.

Finally, the VPI can be used as a pleasure instrument, as the vaginal pressure applied by the VPI is found to increase sexual arousal in a sexual context (this thesis). Physically disabled patients have already shown interest in order to experience sexuality in privacy. This might also be interestingly for the majority of women (70%) who is not used to get an orgasm during intercourse [269]. When vaginal pressure may increase sexual arousal, this may also prevent genital pain.

The VPI is suitable and available for future studies. In cooperation with two Swedish universities we try to improve this device by making it adaptive, i.e., able to exert dynamically different pressures on the vaginal duct to simultaneously guarantee comfort levels and achieve the medical dilation objectives. Another aim is to implement feedback control connecting the patients' comfort levels with their experienced physiological stimuli in a following version of the VPI. Furthermore, we try to facilitate and improve the usability of the VPI by the use of synthetic materials to replace the balloon. The possibilities to further develop the VPI will depend on the financial resources and the involvement of a company. In cooperation with Biomed booster a procedure has started to obtain a patent of the European Patent Office, in order to investigate the commercial potential of the VPI. In time it became clear that the chances for a commercial exploitation of the device are restricted, and thus the procedure was terminated.

Noteworthy, the first publication of the VPI elicited much attention on social media. Some provided adequate information, based on the published article:

https://www.eoswetenschap.eu/psyche-brein/de-voordelen-van-voorspel.
https://www.medicalfacts.nl/2017/11/27/tool-om-pijn-bij-geslachtsgemeenschap-te-meten/.

One journalist from IB times interviewed me and published relevant information, but unfortunately add a juicy incorrect title/ interpretation:

https://www.ibtimes.co.uk/scientists-just-accidentally-invented-entirely-new-kind-sex-toy-women-1630404.

Other sides published incorrect information about the study. Some examples are:

https://punchng.com/scientists-accidentally-invent-new-sex-toy-for-women/

https://www.dailymail.co.uk/health/article-4717142/Want-orgasm-Try-inflatable-sex-toy.html

Journalists from these sides never had any contact with the researchers; they just based the information on the published article - adding incorrect details,- or copied information from other sides, - with more exaggeration as a result.

Scientists better consider in advance whether they would take the risk to accept an interview with a journalist from a social side, even though the quality of that specific side seems acceptable. However, we think it is hard and probably impossible to control the social media in research on juicy stuff… they just take the information from scientific journals and ran with it. Despite that, it can still help to inform the public, break the taboo. We have experienced that, the storm on social media was over quickly and had little impact.

Innovation

A problem in dealing with vaginism is due to the fact that vaginism is a physical response to fear. On the one hand, physicians and pelvic floor therapists taught patients how to tighten and relax the pelvic floor muscles, but hey were not trained in coping with anxiety/ highly anxious patients. On the other hand, psychologists applied CBT using self-exposure (exposure in vivo without assistance of the therapist), but they lacked knowledge of the physical anatomy and specific feared physical triggers and responses to fear. The differentiation between a physical and psychological approach did not help the highly anxious patients to enable and execute vaginal penetration exercises. The first innovation of therapist-supported exposure was to allow psychologists to apply this physical approach in which women were aided with practising vaginal dilation exercises. We started to execute this exposure together with several physicians. This has resulted in the development of the expertise needing for exposure, like coping with specific feared stimuli, hypervigilance, panic attacks, blood phobia as well as various physical and psychological exercises/ advices to enable vaginal

penetration and violate expectancies. This has resulted in a highly specialised, innovative and effective treatment of vaginismus.

The development of a new instrument was needed because no instrument was available to apply standardized introital vaginal pressure in a laboratory while respecting the privacy of participants. The VPI is the first instrument to induce gradually increasing vaginal pressure in a standardized and controlled manner in the introitus vaginae. The possibility to induce gradually increasing vaginal pressure may reflect the more intense genital stimulation during higher levels of sexual arousal. Furthermore, the VPI is the first instrument to apply genital pressure while respecting participant's privacy because the device is remotely controlled. This helps to guarantee a sexual context and to match the experimental setting as closely as possible to the context in which these sensations naturally occur. The VPI has made it possible to substantiate for the first time, the important role of sexual arousal for a positive appraisal of vaginal pressure.

Schedule and implementation

In order to facilitate the process of implementation of the developed expertise to clinical practice, several endeavors have been taken. Together with an international group of experts on vaginismus, we have published a commentary on DSM-5 with respect to The *Demise of Vaginismus in Favor of Genito-Pelvic Pain/Penetration Disorder* in a renowned international journal (Archives of Sexual behaviour). Several newspapers, magazines and local TV channels have payed attention to both the therapist-aided exposure and the VPI. Several social media have paid much attention to the VPI. The expertise towards therapist-aided exposure is described in several national and international book chapters for clinicians and is available via a Dutch website on sexual dysfunctions (www.seksueledisfuncties.nl). The final chapter of this dissertation is submitted and is expected to be accessible within a year. Furthermore, the studies and clinical interventions are presented to many medical and psychological health professionals on congresses and team visit (sexologists, psychologists, cognitive behavioural therapists and gynaecologists). The findings with respect to the VPI are presented to physically disabled patients and their health care takers.

Stanford Medical Center of California has recently started with the first therapist-aided exposure under our supervision. After the permission of the Board of Directors of Stanford Medical Center of California, depending on our endorsement, our colleagues are intended to set up a private clinic for therapist-aided exposure treatment in California, aiming to generate finances for less fortunate patients to get this treatment in Stanford Medical Center.

Strikingly, in the Netherlands, therapist-aided exposure is not yet adopted by colleagues from other hospitals. With respect to patient friendliness and a further development of expertise, it is undesirable that this specialized therapy is only available in the academic hospitals Leiden and Maastricht. In the academic hospital in Leiden there are 5 sexologists involved in this treatment, in Maastricht there is only one sexologist applying therapist-aided exposure (the author of this thesis), which is a severe vulnerable and irresponsible situation. There are several obstacles to the transfer of this expertise in the Netherlands. Firstly, we are intended to set up a following study on vaginismus aiming to reduce post-treatment genital pain. Because women with primary vaginismus are difficult to recruit, it is undesirable to distribute patients to various institutions. Secondly, in the academic field, the development of new studies, expertise and publications seems to be valued more than the implementation of developed knowledge. In view of the restricted involved specialists, together with the various tasks related to patient care, education and research, also a lack of time is playing a role. Thirdly, international publications, cooperation and transfer of expertise are of higher value than national activities. This may lead to the bizarre situation that foreign colleagues might be better informed about new developments than our own colleagues in the Netherlands. Fourthly, many colleagues feel reserved towards starting with this as complicated experienced, specialised treatment. Fifthly, the introduction of market forces in health care strengthens financial motives and increases competition. Here, offering highly specialized care and maintaining exclusivity conflicts with the value of a transfer of expertise.

Solutions for these problems hindering the transferring of knowledge are not easily found. Unfortunately, a policy conversation with health insurance companies to enable a financial compensation for this highly specialized treatment in vaginismus in the specialized Mental Health Care (gespecialiseerde GGZ) did not have any result.

Consequently, the survival of this care depends on the local management of the hospitals. To implement this expertise in different regions in the Netherlands, it may help to offer a training program on the application of therapist-guided exposure treatment, with the primary aim of setting up a national multidisciplinary team of specialists in the Netherlands, followed by the permission from local policy makers. This may generate intervision possibilities, future research and the development of expertise.

Finally, the results of this dissertation have contributed to new research and projects. Firstly, we are intending to assess the effect of a modified version of therapist-aided exposure treatment on women with dyspareunia and/ or sexual abuse experiences. The first clinical experiences are promising. To set up this project, a brainstorm meeting with experts on anxiety of the Academic Center of Anxiety (Mondriaan Zorg Groep), University Maastricht and the Maastricht UMC will be scheduled this year. Possibly, the use of the VPI for diagnostic and clinical applicability's, e.g. to apply exposure and/or EMDR on women with sexual abuse experiences and/ or genital pain, can be integrated in this project. With respect to the finances, we are intended to write a business case to the academic hospital to create opportunities to further integrate and develop this therapy.

Secondly, there are plans to develop an online trainings/ educational program to share our expertise for women with genital pain, in cooperation with Brightness Maastricht Health Campus. For this, it is needed to assess the effect of sexual arousal on the appraisal of vaginal pressure in women with genital pain by use of the VPI. Together with this, the training effect of the VPI on the genital pain can be explored. A final aim is to find grants and/or to start up a company to further realise a more user-friendly version of the VPI. This product can be merchandised in combination with an online prevention/ self-help program in order to prevent and overcome genital pain.