

## 2024QualifyingCondition-927

Upon petition, the State Medical Board of Ohio has the authority to approve and designate conditions or diseases as qualifying medical conditions for treatment with medical marijuana. For the calendar year of 2024, the board will accept petitions for consideration between **November 1, 2024** and **December 31, 2024**.

## Covered Existing Qualifying Conditions

The following conditions are already part of the program: AIDS, amyotrophic lateral sclerosis, Alzheimer's disease, cachexia, cancer, chronic traumatic encephalopathy, Crohn's disease, epilepsy or another seizure disorder, fibromyalgia, glaucoma, hepatitis C, Huntington's disease, inflammatory bowel disease, irritable bowel syndrome, multiple sclerosis, pain that is either chronic and severe or intractable, Parkinson's disease, positive status for HIV, post-traumatic stress disorder, sickle cell anemia, spasticity, spinal cord disease or injury, terminal illness, Tourette syndrome, traumatic brain injury, and ulcerative colitis.

The board's Medical Marijuana Committee determined that the following are considered to be covered by an existing qualifying condition:

- Arthritis (determined to be covered by pain that is either chronic or intractable, February 2021)
- Chronic Migraines (determined to be covered by pain that is either chronic or intractable, February 2021)
- Complex Regional Pain Syndrome (determined to be covered by pain that is either chronic or intractable, February 2021)
- Degenerative Disc Disease (determined to be covered by pain that is either chronic or intractable, February 2022)
- Lupus where pain is present (determined to be covered by pain that is either chronic or intractable, February 2022)

You do not need to submit a petition for any of these conditions. Read the board's [Position Statement \(PDF\)](#).

## Petition Consideration Denials

The petition will not be considered if:

- Received after **December 31, 2024**
- It seeks to add a broad category of diseases or conditions
- The condition that has been previously reviewed by the board and rejected unless new scientific research that supports the request is offered

## Previously Considered Condition

If you are petitioning for a previously considered condition:

- Do not resubmit documents which have already been reviewed by the board
- Only new scientific research should be submitted for previously rejected petitions
- View a catalogue of [submitted research and documents](#).

## Public Record

Most information submitted as part of a petition is public record and may be posted on the Medical Board's website at med.ohio.gov. This includes the submitter's name provided contact information, and responses.

## Instructions

- All sections below are required to be completed per Ohio Administrative Code 4731-32. All text boxes are required. Applicants may type "see attached" or "previously submitted" in the required fields.
- If you would like for the Medical Board to consider multiple conditions, please complete a separate submission for each one.
- Please refrain from providing personal medical information as all submissions are subject to public record requests.

First Name *	Last Name *	Email *
Douglas	Woo	dougthekinezo1@gmail.com
Address *	City *	State *
1513 Clover Court	Lancaster	OHIO
Zip Code *	County *	Specific Disease or Condition *
43130	FAIRFIELD	Female Orgasmic Difficulty Disorder (FOD)

**Please do not include any links in the text fields. All materials submitted for review must be attached in the format of a Microsoft Word document or PDF.**

**NOTE: Links within submitted documents will not reviewed.**

## Specialized Experts

Information from experts who specialize in the disease or condition ⓘ \*

Please see the list of medical doctors, therapists, and specialists who specialize in cannabis as a treatment for female orgasmic difficulty/disorder (FOD).

File Name	Size
<a href="#">Specialized Experts.docx</a>	16.45 kB

## Medical or Scientific Evidence

Relevant medical or scientific evidence pertaining to the disease or condition \*

Please see attached the official approval documentation from the states of Illinois and Connecticut; the two states that approved female orgasmic disorder (FOD) as a qualifying condition for medical cannabis in 2023. Attached also is New Mexico's Board approval of FOD being added as a qualifying condition of treatment with medical cannabis.

Please also refer to original petition submitted in 2023 for relevant medical or scientific evidence pertaining to the disease or condition.

File Name	Size
<a href="#">Connecticut Approves FOD.pdf</a>	176.26 kB
<a href="#">New Mexico Officials Approve Medical Marijuana As A Treatment For Female Orgasm Difficulty.pdf</a>	177.88 kB
<a href="#">ILLINOIS APPROVES FOD.pdf</a>	742.86 kB

## Conventional Medical Therapies

Consideration of whether conventional medical therapies are insufficient to treat or alleviate the disease or condition \*

There are no conventional medications to treat female orgasmic difficulty/disorder. Please refer to original petition submitted in 2023 with more detailed information to the paucity of FOD treatments.

File Name	Size
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## Supporting Evidence

Evidence supporting the use of medical marijuana to treat or alleviate the disease or condition, including journal articles, peer-reviewed studies, and other types of medical or scientific documentation \*

Attached please find five (5) peer-reviewed research studies that have been published since the petition was submitted in 2023, including one randomized controlled trial (Banbury et al., 2024) and a document highlighting the results of these studies.

File Name	Size
<a href="#">Use and perceived impact of cannabis on orgasm in post menopause women.pdf</a>	60.74 kB
<a href="#">Excerpts of results from 2024 scientific studies and citations.pdf</a>	173.46 kB
<a href="#">A Preliminary Investigation into the Use of Cannabis Suppositories and Online Mindful Compassion for Improving Sexual Function Among Women Following Gynaecological Cancer Treatment.pdf</a>	520.62 kB
<a href="#">Update on cannabis in human sexuality.pdf</a>	775.63 kB
<a href="#">How do women experience dyadic sexual activities at the attentional level, a qualitative study comparing anorgasmic and orgasmic women.pdf</a>	366.23 kB
<a href="#">Assessment of the effect of cannabis use before partnered sex on women with and without orgasm difficulty.pdf</a>	888.35 kB

#### Physician Letters of Support

Letters of support provided by physicians with knowledge of the disease or condition. This may include a letter provided by the physician treating the petitioner, if applicable. \*

Please see additional letters of support.

File Name	Size
<a href="#">Dr. Nan Wise Letter of Support.docx</a>	12.98 kB
<a href="#">Dr. Clark letter of support universal.pdf</a>	47.73 kB
<a href="#">Dr. Norelyn Letter in support of cannabis.pdf</a>	139.90 kB

## Specialized Experts

**Jordan Tishler, MD**, is a Cannabis Medical Doctor specializing in medical cannabis treatment for female orgasmic difficulty/disorder (FOD) and other male and female sexual dysfunctions. He is the CEO of inhaleMD, Inc., a Massachusetts-based medical practice, President of the Association of Cannabinoid Specialists, Vice President of the Female Orgasm Research Institute, and Instructor of Medicine at Harvard Medical School.

Dr. Jordan Tishler has treated more than 12,000 patients with medical cannabis, including women who suffer from FOD. He gave public testimony and presented his experience and expertise treating patients with medical cannabis who had FOD at medical cannabis board meetings in five US states that are/were considering adding FOD as a condition of treatment with medical cannabis.

Dr. Tishler's letter of support to add FOD as a condition of treatment with medical cannabis was included in 11 petitions that have been submitted to US states thus far.

Dr. Tishler co-authored a study titled, *Assessment of the effect of cannabis use before partnered sex on women with and without orgasm difficulty*, published in the peer-reviewed journal, *Sexual Medicine*, in May, 2024. The study revealed statistical evidence that cannabis improved orgasm frequency, ease, and satisfaction for women with FOD and supported 50 years of research and anecdotal reports of cannabis helping women who experience FOD.

**Becky Lynn, MD, MBA**, is a Board-Certified gynecologist and a nationally renowned expert in female-focused cannabis care. In addition to sitting on the board of the Cannabis Science and Operations Program at St. Louis University, Dr. Lynn was a lead author of a prominent study published in 2019, titled, *the Relationship between Marijuana Use Prior to Sex and Sexual Function in Women*. Her study identified the positive relationship between cannabis use, orgasm satisfaction, and sexual function in women. Dr. Lynn conducted a second study, published in 2020 titled, *Effects of Cannabinoids on Female Sexual Function*.

Dr. Lynn is the Founder and CEO of Evora Women's Health at St. Luke's in Chesterfield, Missouri. She is a certified sexual counselor having trained at Medical Sex Therapy in Palm Beach, Florida. She is also an adjunct professor of obstetrics and gynecology at St. Louis University.

**Amanda Moser, MA**, is a Certified Sexologist and Cannabis Researcher based in Colorado. Ms. Moser was the leading expert on a cannabis and sex study published in a peer-reviewed journal in 2023 titled, *The influence of cannabis on sexual functioning and satisfaction*. Overall, the results indicated that both men and women perceived that cannabis use increased their sexual functioning and satisfaction, particularly increased desire and orgasm intensity. The medical implications of the study included the possible use of cannabis for treating sexual dysfunctions, especially for women.

**Diane Urman, PhD, MSW**, is a San-Fransisco, CA, based Certified Clinical Sexologist, Certified Sex Educator, and Licensed Clinical Social Worker. Dr. Urman uses cannabis in her clinical practice to assist women who suffer from female orgasm difficulties/disorder (FOD), including women who have never orgasmed.

Dr. Urman was one of the first sex therapists to publically announce that she recommended cannabis to clients who had trouble orgasming or who have never orgasmed. In 2017, she was featured in Vice Magazine, in an article titled, *“The Sex Therapists Using Pot to Help Patients Find Their “Full Sexual Potential.”* In 2019, she was featured in an article titled, *“Marijuana as a sex aid? San Fransisco therapist Diana Urman says, “yes.”* And in 2020, she was interviewed by the Huffington Post where she discussed the usage of cannabis in her clinical practice.

**Ashley Manta, MA**, is an award-winning sex educator and coach who has become a leading authority on mindfully combining sex and cannabis as part of her CannaSexual™ brand. She became an internationally recognized advocate and expert helping women and men utilize cannabis to improve sexual experiences, especially women who have a history of trauma-related disorders.

Ms. Manta wrote a letter of support for female orgasm difficulty disorder (FOD) that has been included in every petition package to have FOD be added as a condition of treatment with medical cannabis. She has given personal and professional testimony regarding cannabis for the treatment of FOD at several state Medical Cannabis Board meetings.

**Suzanne Mulvehill, PhD, MBA**, is a Clinical Sexologist, Cannabis Researcher, and President of the Female Orgasm Research Institute, a 501c3 non profit organization based in Florida. Dr. Mulvehill leads the Women’s Cannabis Project, a public policy initiative focused on female orgasm difficulty/disorder (FOD) being as recognized and qualified condition of treatment with medical cannabis. As of this writing, two states added FOD to their list of qualifying conditions with medical cannabis; Connecticut and Illinois.

Dr. Mulvehill co-authored a study with Dr. Jordan Tishler titled, *Assessment of the effect of cannabis use before partnered sex on women with and without orgasm difficulty.* She published literature reviews and scientific theories that explore why cannabis helps women orgasm and she has presented her research at international conferences.



# Medical Marijuana Board of Physicians Approves Two New Qualifying Conditions

6/10/2024

*Autism Spectrum Disorder and Female Orgasmic Difficulty/Disorder Added to List of Qualifying Conditions For Adults 18 and Older*

HARTFORD – The Department of Consumer Protection has added two new conditions to the list of qualifying conditions for the Medical Marijuana Program. The conditions were unanimously approved Friday by the Medical Marijuana Program Board of Physicians.

**The two conditions unanimously approved for individuals 18 and over to the program are:**

- Autism Spectrum Disorder
- Female Orgasmic Difficulty/Disorder

“Thank you to the petitioners who gave thoughtful and well-researched presentations to the Board, and shared their personal stories with these conditions,” said **DCP Commissioner Bryan T. Cafferelli**. “I would also like to thank the Board of Physicians for volunteering their time to share their medical expertise, and for their thoughtful questions and consideration of the petitions.”

There are currently 39,749 medical marijuana patients, and 1,816 certifying physicians registered with the state's program. There are 42 conditions that qualify adult patients for medical marijuana, and 11 conditions that qualify patients under 18. The Board of Physicians consists of nine members.

Qualifying patients and their caregivers registered with the Medical Marijuana Program can purchase medical marijuana products at medical marijuana dispensary facilities and hybrid retailers.

- Medical marijuana is not subject to sales and excise tax at dispensary facilities and hybrid retailers.
- Medical Marijuana Patients receive priority entry at hybrid retailers.
- Medical Marijuana Patients may purchase up to 5 ounces per month.
- Certain products, including those with higher potency and some dosage forms, are only available to registered medical marijuana patients.

Those who wish to petition the Board of Physicians to add a debilitating condition to qualify for medical marijuana may visit DCP's Medical Marijuana Program website at <http://ct.gov/dcp/mmp> to read about the process. Any questions can be directed via email to [dcp.mmp@ct.gov](mailto:dcp.mmp@ct.gov).

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Website link: [https://portal.ct.gov/dcp/news-releases-from-the-department-of-consumer-protection/2024-news-releases/medical-marijuana-board-of-physicians-approves-two-new-qualifying-conditions?language=en\\_US](https://portal.ct.gov/dcp/news-releases-from-the-department-of-consumer-protection/2024-news-releases/medical-marijuana-board-of-physicians-approves-two-new-qualifying-conditions?language=en_US)

**DEPARTMENT OF PUBLIC HEALTH  
STATE OF ILLINOIS**

IN RE PETITION FOR ADDITION OF ) Docket No. MC 24-01  
FEMALE ORGASMIC DISORDER )  
AS A DEBILITATING )  
MEDICAL CONDITION )

**FINAL ORDER**

THIS CAUSE, coming before the Illinois Department of Public Health pursuant to the Compassionate Use of Medical Cannabis Program Act, 410 ILCS 130 (“Act”), and the Compassionate Use of Medical Cannabis Patient Registry Code, 77 Ill. Adm. Code 946 (“Code”), on a petition to add Female Orgasmic Disorder as a debilitating medical condition.

After considering the petition the Department finds as follows:

1. The petition to add Female Orgasmic Disorder as a debilitating medical condition was timely submitted to the Department for consideration and review.
2. Section 45(f) of the Act gives the Director the authority to enter a final decision regarding the acceptance or denial of the proposed debilitating medical conditions.
3. After fully considering the matters raised in the petition as well as reviewing research pertinent to the condition termed Female Orgasmic Disorder (A condition where a (natal) female has difficulty reaching orgasm. There are multiple types and a wide variety of causes.), there is sufficient evidence to confidently evaluate the effect of cannabis as a treatment for Female Orgasmic Disorder. Literature review and survey data support that cannabis can offer benefits to individuals who have “female orgasm difficulties or dysfunction”.
4. Accordingly, the petition to add Female Orgasmic Disorder as a debilitating medical condition is hereby APPROVED.

This Order is a final administrative decision within the provision of the Compassionate Use of Medical Cannabis Program Act, 410 ILCS 130 and the Administrative Review Law, 735 ILCS 5/3-101.

**ILLINOIS DEPARTMENT OF PUBLIC HEALTH**

By: Sameer Vohra  
Sameer Vohra, MD, JD, MA  
Director, Department of Public Health  
535 W. Jefferson Street, 5th Floor  
Springfield, Illinois 62761

Date: November 15, 2024



# New Mexico Officials Approve Medical Marijuana As A Treatment For Female Orgasm Difficulty



Published

on  
October 8, 2024  
By

[Ben Adlin](#)



A New Mexico regulatory board has given preliminary approval to make female orgasm difficulty (FOD) a qualifying condition for the state's medical marijuana program, voting 7–2 to recommend the change at a meeting on Monday.

The New Mexico Medical Cannabis Advisory Board's vote does not immediately add FOD as a qualifying condition. A report with the board's recommendation will next go to the secretary of health, who will review the proposal and consult with staff before either accepting, denying or modifying the recommendation.

That's according to an email from the acting director of the New Mexico Department of Health's Center for Medical Cannabis forwarded to Marijuana Moment by Suzanne Mulvehill, a clinical sexologist and researcher who's helped lead the charge to add FOD as a qualifying condition in a number of states with legal cannabis.

Mulvehill told Marijuana Moment that she's "very pleased" with the movement in New Mexico, noting that officials in Connecticut and Illinois have also taken steps to add FOD as qualifying conditions in those jurisdictions.

"FOD affects millions of women worldwide," she added, "and there are no conventional treatments."

Two additional states are currently considering adding FOD as a medical marijuana qualifying condition. Oregon held a virtual public meeting earlier this month and is accepting public comments through Friday. And in Arkansas, which held a public meeting about FOD last month, officials are taking comments until October 14.

Mulvehill noted that support for the New Mexico addition of FOD came from a growing network of researchers and advocates across the country and world. They include the woman who petitioned that FOD be added as a qualifying condition in Oregon, Rebecca Andersson—who told Marijuana Moment earlier this year that cannabis was "revolutionary" in helping her orgasm after a cancer diagnosis, treatment and a radical hysterectomy—as well as researchers in the United States and Europe. Undergirding arguments by petitioners in states across the country is a growing body of research showing that cannabis can help improve orgasm ease, frequency and satisfaction in people with FOD.

Mulvehill herself has published research with co-author Jordan Tishler—a doctor at the Association of Cannabinoid Specialists and the company inhaleMD—finding that more than 7 in 10 of those who experienced challenges in achieving orgasm reported that cannabis use increased their orgasm ease (71 percent) and frequency (72.9 percent). Two-thirds (67 percent) said it improved orgasm satisfaction.

Tishler, too, commented in favor of New Mexico's addition of FOD as a qualifying condition at Monday's board meeting.

Mulvehill has also filed petitions herself in some states to add FOD as a qualifying condition, and she's helped women in other states submit paperwork of their own to begin the process of adding FOD as a qualifying condition.

Past successes, she told Marijuana Moment, have helped build momentum for the cause. In June, for example, a board in Connecticut voted unanimously to approve FOD as a qualifying condition—a development that drew attention from people in other parts of the country, Mulvehill said.

The effort also looks promising in Illinois, where officials in March unanimously recommended FOD's adoption as a qualifying condition. The move still requires agreement from a top official.

As more states consider the addition, Mulvehill has also expanded her advocacy and education efforts. She told Marijuana Moment she's currently developing training programs to help therapists better incorporate cannabis as medicine and also plans to launch a podcast, called The Orgasm Hour, sometime later this year.

She's also scheduled to present research on cannabis and female orgasms at the Society for Cannabis Clinicians conference on October 12. And Mulvehill and Tishler have a new forthcoming journal article that's currently in the review process.

Among other research into marijuana and sexual health, a study last year in the Journal of Cannabis Research found that more than 70 percent of surveyed adults said cannabis before sex increased desire and improved orgasms, while 62.5 percent said cannabis enhanced pleasure while masturbating.

Because past findings indicated women who have sex with men are typically less likely to orgasm than their partners, authors of that study said cannabis "can potentially close the orgasm in equality gap."

A 2020 study in the journal Sexual Medicine, meanwhile, found that women who used cannabis more often had better sex.

Numerous online surveys have also reported positive associations between marijuana and sex. One study even found a connection between the passage of marijuana laws and increased sexual activity.

Yet another study, however, cautions that more marijuana doesn't necessarily mean better sex. A literature review published in 2019 found that cannabis's impact on libido may depend on dosage, with lower amounts of THC correlating with the highest levels of arousal and satisfaction. Most studies showed that marijuana

has a positive effect on women’s sexual function, the study found, but too much THC can actually backfire.

“Several studies have evaluated the effects of marijuana on libido, and it seems that changes in desire may be dose dependent,” the review’s authors wrote. “Studies support that lower doses improve desire but higher doses either lower desire or do not affect desire at all.”

Part of what cannabis appears to do to improve orgasms is interact with and disrupt the brain’s default mode network, Tishler told Marijuana Moment in an interview earlier this year. “For many of these women, who cannot or do not have an orgasm, there’s some complex interplay between the frontal lobe—which is kind of the ‘should have, would have, could have [part of the brain]’—and then the limbic system, which is the ‘emotional, fear, bad memories, anger,’ those sorts of things.”

“That’s all moderated through the default mode network,” he said.

Modulating the default mode network is also central to many psychedelic-assisted therapies. And some research has indicated that those substances, too, may improve sexual pleasure and function.

Earlier this year, for example, a paper in the journal Nature Scientific Reports that purported to be the the first scientific study to formally explore the effects of psychedelics on sexual functioning found that drugs such as psilocybin mushrooms and LSD could have beneficial effects on sexual functioning even months after use.

“On the surface, this type of research may seem ‘quirky,’” one of the authors of that study said, “but the psychological aspects of sexual function—including how we think about our own bodies, our attraction to our partners, and our ability to connect to people intimately—are all important to psychological wellbeing in sexually active adults.”



**Ben Adlin**

Ben Adlin, a senior editor at Marijuana Moment, has been covering cannabis and other drug policy issues professionally since 2011. He was previously a senior news editor at Leafly, an associate editor at the Los Angeles Daily Journal and a Coro Fellow in Public Affairs. He lives in Washington State.

**Results:** 451 women responded to the survey. Of those women, 85 (29.9%) stated they used cannabis specifically to help with orgasm. Overall, 70% stated “it helped them orgasm”, 24.4% stated, “It helped a little” and 5.6% stated, “It did not help”. Smoke or Vape: 52.8% Yes, it helped-78.7% It helped a little-17% It did not help-4.3% Edibles: 37.1% Yes, it helped-61% % It helped a little-33% It did not help- 6.1 % Local application to genitals: 6.7% Yes, it helped 66.7% It helped a little 33.3% It did not help- 0% Tinctures or lozenges: 3.4% Yes, it helped-66.7% It helped a little -33% It did not help- 0%

**Conclusions:** Theoretically, cannabis may facilitate post-menopause orgasm due to its known vasodilation and anti-inflammatory properties. Studying the efficacy of cannabis for the relief of specific symptoms is challenging since pharmacology is complex and dictated by variables such as route of consumption, product strain, genetics, sex, age, medical comorbidities, medications, and concomitant use of estrogen. In addition, one cannot count on the same level of consistency with individual products as with a commercial pharmaceutical. The perception of relief of symptoms is high, however, the impact of a placebo effect and the actual efficacy of individual practices cannot be determined given the above variables. The majority of women in the survey used edibles or inhalation, which may not be the most efficacious route of consumption to facilitate clitoral sensitivity. A larger population of women using direct application of cannabis to the clitoris would be useful. This study confirms the wide use of cannabis use in the menopause population specifically to facilitate orgasm and is useful in not only understanding current practices but will also inform the design of future studies.

**Disclosure:** Any of the authors act as a consultant, employee or shareholder of an industry for: Sermonix.

**Abstract citation ID: qdae054.020**

**(020) USE AND PERCEIVED IMPACT OF CANNABIS ON ORGASM IN POST MENOPAUSE WOMEN**

*L. Streicher*<sup>1</sup>

<sup>1</sup>*Northwestern University*

**Introduction:** 55% of post-menopause women experience orgasmic dysfunction as a result of aging, vasculopathy, neuropathy, medications, and medical comorbidities. Orgasmic dysfunction can also be a downstream consequence of dyspareunia, genitourinary syndrome of menopause, hypoactive sexual desire disorder, and symptoms of menopause such as vasomotor symptoms and insomnia. There are no FDA-approved treatments for the treatment of FOD. At least one in four post-menopause women use cannabis, however, the frequency, route of consumption, and perceived efficacy of cannabis to facilitate orgasm in this population has not been studied.

**Objective:** To determine the frequency, route of consumption, and perceived efficacy use of cannabis to facilitate orgasm in a peri and post-menopause population.

**Methods:** Women self-described as peri- or post-menopause, who currently or had recently used cannabis for relief of specific menopause symptoms, were recruited via social media and invited to complete an online survey. For each symptom, respondents were asked about the route(s) of consumption, and the perception of efficacy.

## Article

# A Preliminary Investigation into the Use of Cannabis Suppositories and Online Mindful Compassion for Improving Sexual Function Among Women Following Gynaecological Cancer Treatment

Samantha Banbury <sup>1,\*</sup>, Hannah Tharmalingam <sup>2</sup>, Joanne Lusher <sup>3,\*</sup> , Simon Erridge <sup>4</sup>  and Chris Chandler <sup>1</sup>

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**Abstract:** *Background and Objectives:* The impact of gynaecological cancer and its treatments on sexual intimacy can be profound on female sexuality. However, very few registered clinical trials have addressed sexual intimacy among this cohort. *Materials and Methods:* This preliminary randomised control trial (RCT) and content analysis assessed the effectiveness of a brief online mindful compassion group intervention adjunct with cannabis suppositories. Eighty-three participants aged between 18 and 50+ years who were at least six months post-cancer treatment were randomly allocated to one of four groups, depending on whether they were already using cannabis suppositories. These included a cannabis-only group (CO), a mindful-compassion group (MC), a combined mindful-compassion and cannabis suppositories group (COCM) and a care-as-usual group (CAU). Measurements of sexual function, sexual self-efficacy, mindful compassion, well-being and quality of life were taken at weeks 0, 4 and 12. *Results:* Sexual function, including arousal, lubrication and orgasms, improved for both the MC  $p = 0.002$  and COCM  $p \leq 0.001$  groups; in addition, sexual pain was reduced in the COCM  $p = 0.008$  and CO  $p \leq 0.001$  groups compared to the CAU and MC groups, where  $p \geq 0.05$ . Feedback suggested that cannabis mediated the effects of mindful compassion and supported well-being, sexual self-efficacy, and quality of life. Participants also voiced a preference for cannabis suppositories when using dilators as part of their treatment and the use of sex toys instead of dilators, suggesting that dilators had negatively impacted their sexuality. *Conclusions:* These preliminary and exploratory outcomes look promising and provide a foundation for future research to develop varied healthcare options to improve mental health service delivery and quality of life for this cohort.

**Keywords:** cancer; mindful compassion; mental health service delivery; quality of life



**Citation:** Banbury, S.; Tharmalingam, H.; Lusher, J.; Erridge, S.; Chandler, C. A Preliminary Investigation into the Use of Cannabis Suppositories and Online Mindful Compassion for Improving Sexual Function Among Women Following Gynaecological Cancer Treatment. *Medicina* **2024**, *60*, 2020. <https://doi.org/10.3390/medicina60122020>

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## 1. Introduction

There are five main types of gynaecological cancers (GC): ovarian, uterine, vulvar, cervical, and vaginal. In the UK, there are approximately 20,000 annual diagnoses of one of these cancers [1]. According to research [2], 1.39 million women live with GC. The diagnosis of GC negatively impacts psychological well-being, sexual well-being and quality of life [3]. Most of those with GC present with sexual dysfunction [4,5]. Briefly, sexual dysfunction is a group of sexual disorders in which there are disruptions in the sexual response cycle, including the loss of one or more of the phases or aspects of sexual response, i.e., sexual desire, sexual arousal, vaginal lubrication, orgasm, and sexual pain [6]. This tends to include up to 75% of sexual attempts and can be lifelong or acquired in presentation [6].

Sexual functioning can be impaired by the treatments; these often involve pelvic irradiation, the long-term side effects of which can impact lubrication and orgasm and cause pain and arousal difficulties [7,8]. The impact of gynaecological brachytherapy, which is the standard of care for cervical cancer patients undergoing radical treatment, has frequently been reported to cause long-term pain, anxiety and distress [9]. Numbness/loss of sensation may be a further byproduct of treatments for GC, along with early menopause, further resulting in sexual dysfunction [8,10].

There is a lack of effective therapies for these individuals affected by sexual dysfunction, and various psychosexual interventions have been suggested [8]. The use of testosterone for women with compromised sexual desire remains inconclusive. In an RCT looking at the role that transdermal testosterone may play in sexual desire among post-breast cancer women, the results were non-significant [11]. The use of oestrogen at low doses for women with a history of gynaecological cancer and who are going through menopause has also been recommended [12]. Therapeutically, the use of cognitive behavioural therapy (CBT) looks favourable in the context of supporting sexual dysfunction. A meta-analysis yielded a moderate effect size ( $d = 0.58$ ) when using CBT to support sexual dysfunction [13]. Of a similar effect size, a meta-analysis looking at mindfulness training has shown it to support sexual dysfunction ( $d = 0.55$ ) [14]. Other authors [15] compared CBT with mindfulness training for sexual pain and found that mindfulness was more effective than CBT. A systematic review of 10 studies looking at sexual intimacy and cancer found that mindfulness was supportive in helping women with sexual dysfunction who were post-breast or gynaecological cancer across all sexual domains [16]. In one such study [7], 31 participants with cervical cancer (mean age 54.0; age range 31–64) with sexual desire and/or sexual arousal concerns were randomised into an experimental group consisting of three 90-min mindfulness-based cognitive behaviour therapy sessions or a wait-list control group (participants would receive the intervention after 2 months). Outcomes led to significant improvements in sexual domains, including sexual desire and arousal, with a reduction in sexual distress.

The use of mindful compassion has now been introduced to supporting women post-breast cancer treatment. Briefly, mindful compassion focuses on embracing self-compassion and accepting negative feelings and thoughts. This method uses mindfulness in a more targeted way to support emotional discomfort with compassion and acceptance [17]. A few studies have looked at the role that mindful compassion might have in supporting sexual dysfunction. For example, in a sample of 36 women with GPPPD (genito-pelvic pain/penetration disorder), the technique was found to be supportive in reducing sexual pain after six mindful compassion workshops [18]. Our unpublished preliminary data provided a brief online mindful compassion intervention for 52 women post-breast cancer treatment in a waitlist-controlled randomised controlled trial (RCT). This comprised a brief 4-week online intervention. The outcomes were promising, and improvements were reported across all sexual domains, including sexual arousal, sexual desire, orgasm, satisfaction and lubrication. However, orgasms fluctuated across the delivery of this intervention. A feedback evaluation by participants suggested that they would have preferred their partners to be included in the study. Whilst their sexual desire and arousal had increased, their partners' levels had remained the same, resulting in a sexual desire discrepancy. Further, the topic of sexual intimacy was not adequately addressed by healthcare practitioners, which had impacted quality of life (QOL). Indeed, out of 42 participant responses yielded from the content analysis, 31% stated that "we are human and have needs", and 11.9% felt like they had been shut down in healthcare when the topic of sex was raised and were offered support. Despite research highlighting the relationship between GC and sexual difficulties, there is a paucity of research looking at suitable interventions to support the psychosexual elements associated with sexual dysfunction in oncology healthcare settings [19].

Cannabis has also been used historically to address sexual pain. For example, a systematic review of 16 studies revealed that the use of CBD or THC at between 70 and 2000 mg significantly reduced levels of gynaecological pain in up to 61–95.5% of participants after

3 months of use [20]. In the UK, medical cannabis (MC) was rescheduled in 2018 and can now be prescribed for individuals with chronic physical and mental health conditions that are refractory to licensed medications [21]. Research, although inconclusive, has suggested that cannabis possesses analgesic properties and can help reduce pain [22]. Limited research has compared the pain-minimising properties of CBD and THC suppositories. However, researchers comparing the pain-minimising effects of THC suppositories compared to the oral use of THC have suggested that their efficacy is up to 50% higher [23].

Mindful compassion and cannabis suppositories have been suggested in supporting sexual pain among men who have sex with men (MSM) with anodyspareunia [24]. A sample of 52 MSM was randomised to one of four groups, based on whether they had been using cannabis suppositories. This included THC, CBD and combined CBD/THC. Groups included a mindful-compassion-only group, a cannabis suppository-only group, a combined mindful compassion and cannabis suppository group and a care-as-usual group. Measurements of anodyspareunia, mindful compassion, well-being, sexual functioning and sexual self-efficacy were taken at weeks 0, 4 and 12. The outcomes favoured the combined cannabis suppository and mindful compassion group compared to the other groups in all domains. However, there was no significant difference between outcomes in terms of pain regarding the use of CBD, THC and combined THC/CBD suppositories. The authors attributed this to the small sample size, which means that a larger sample might have yielded different outcomes.

Based on the literature review, it was decided to explore the use of mindful compassion with cannabis suppositories for women after gynaecological cancer treatment. To the authors' knowledge, this is the first study to address this adjunct intervention among this cohort. However, randomisation was limited owing to the legalities of medical cannabis in the UK; hence, the cohort was randomised into groups based on whether they were using cannabis suppositories. We also wanted to establish whether the outcomes would indicate any differences between THC and CBD in terms of levels of pain. As well as pain, other sexual domains including lubrication, arousal, desire, orgasm and sexual satisfaction were measured, along with well-being, sexual self-efficacy and QOL. For this preliminary study, the focus was on vaginal intercourse and masturbation only (not anal sex).

The following four groups were included in this study.

- (1) Cannabis-only group (CO).
- (2) Mindful compassion group (MC).
- (3) Cannabis suppositories and mindful compassion group adjuncts (COMC).
- (4) Care as usual (CAU/control group/not using cannabis suppositories or engaging in mindful compassion).

Randomisation to the mindful compassion or CAU groups depended on whether participants were using cannabis suppositories. The following hypotheses were assessed:

- There would be a significant effect of time on sexual self-efficacy, mindful compassion, sexual functioning, well-being and QOL for the CO, MC and COMC groups.
- There would be no significant effect of time on sexual self-efficacy, mindful compassion, sexual functioning, well-being and QOL in the CAU group.
- Levels of sexual functioning and sexual pain would vary between CBD and THC suppositories in the MC and COMC groups.

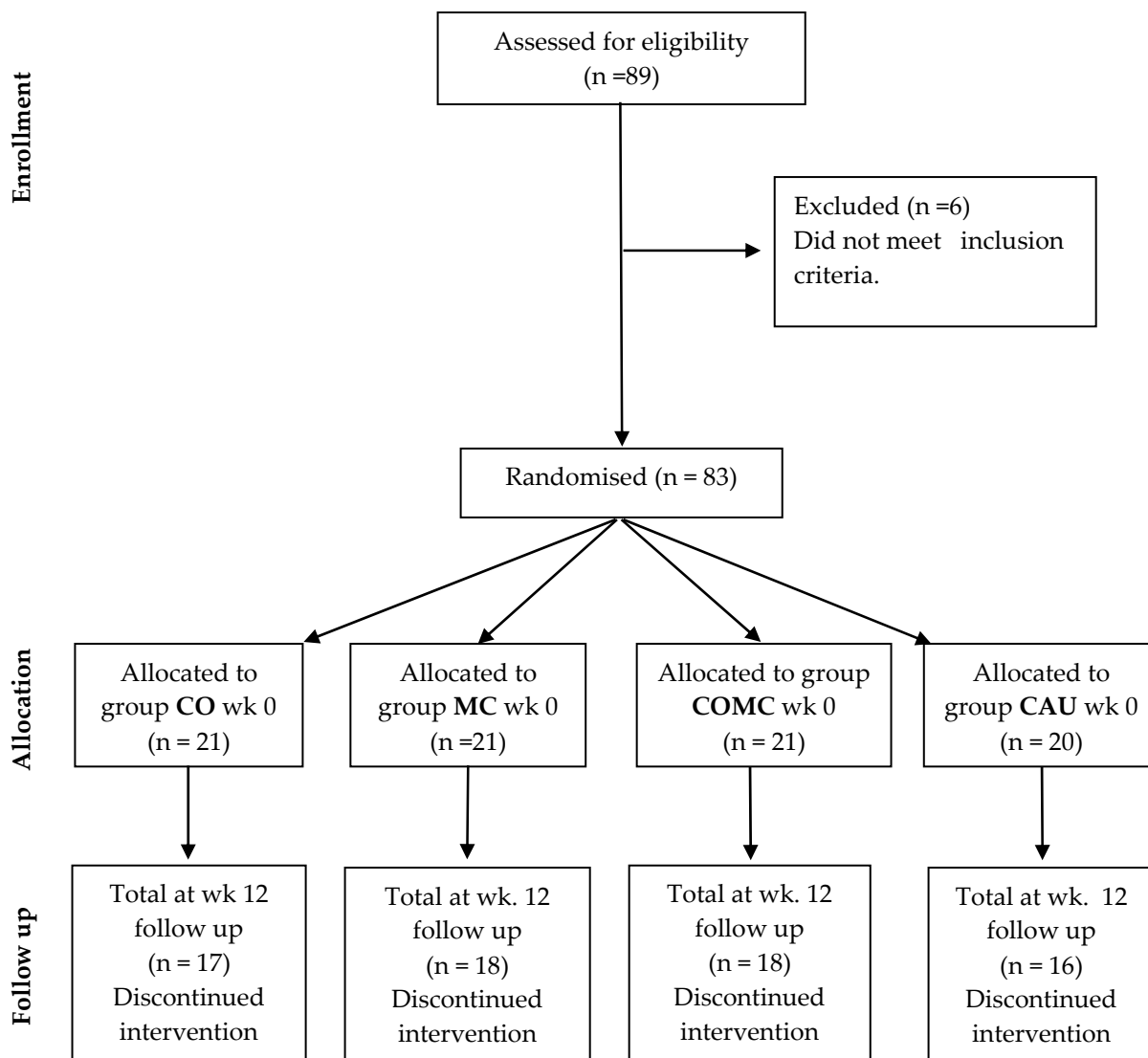
## 2. Materials and Methods

### 2.1. Design

#### 2.1.1. Study 1

A parallel randomisation approach was used with four groups: the CO, MC, COMC and CAU comparative groups. The intervention (see Figure 1) was delivered online for four weeks, with a twelve-week follow-up. Participants were sourced via TikTok and LinkedIn.





**Figure 1.** The flow of participants through each stage of a combined cannabis suppository and mindful compassion randomised controlled trial. Key: Cannabis-only group (CO), mindful compassion group (MC), cannabis suppositories and mindful compassion group adjuncts (COMC), and care as usual (CAU).

### 2.1.2. Study 2

Feedback, gathered using the Mentimeter app (Mentimeter, Stockholm, Sweden), was sought throughout the intervention’s delivery at weeks 0, 4 and 12. A series of open-ended questions was aimed at establishing the participants’ thoughts and feelings about the intervention. The questions were similar for all groups; however, the questions had to apply to each group and were based on the questions used in a previous study [24], which examined MSM with anodyspareunia.

### 2.2. Participants

As can be seen in Table 1, Eighty-three participants contributed to the study (n = 21 CO, n = 21 MC, n = 21 COMC, n = 20 CAU). Forty-two participants were already using cannabis suppositories. Attrition rates were reasonable and predominated in the CAU and CO groups, with 69 (83.1%) remaining in the study at week 12 of follow-up (n = 17 CO, n = 18 MC, n = 18 COCM, n = 16 CAU). Eleven participants (13.3%) were aged between 18 and 30 years; n = 51 (61.4%) were aged between 31 and 50 years and 21 participants (25.3%) were aged 51 years and above. Menopause, including early menopause, accounted

for n = 43 (51.8%) participants. Ethnicity consisted of n = 52 (62.7%) white, n = 30 (36.1%) African Caribbean and n = 1 (1.2%) Pakistani participants. Of the sample, n = 21 (25.4%) were not partnered, n = 7 (8.4%) were partnered for up to 1 year, n = 15 (18.1%) had been partnered for between 1 and 2 years, n = 11 (13.3%) were partnered up to 4 years and n = 29 (34.9%) were partnered for 5 years and above. Of these, n = 77 (92.8%) identified as heterosexual and n = 6 (7.2%) were bisexual. Outside of post-cancer treatments, n = 44 (53.0%) were not taking any prescription medication, n = 26 (31.3%) were prescribed heart medication and n = 13 (15.7%) were using insulin. Outside the use of cannabis suppositories, n = 53 (63.9%) were not using any substances, n = 7 (8.4%) used cocaine recreationally and n = 4 (4.8%) used speed/amphetamine. N = 23 (27.7%) did not drink alcohol, n = 49 (59.0%) consumed up to 14 units of alcohol weekly, and n = 11 (13.3%) consumed more than 14 units of alcohol weekly. Of the sample, n = 42 (50.6%) did not exercise, n = 15 (18.1%) exercised approximately 3 times a week, n = 18 (21.7%) exercised weekly and n = 8 (9.6%) did not state their exercise level. Post-cancer duration included 6 months (n = 25 (30.1%)), 12 months (n = 23 (27.7%)), 18 months (n = 23 (27.7%)) and 24 months (n = 12 (14.5%)). The stages of cancer varied from stage 1 (n = 41 (49.4%)), stage 2 (n = 39 (47.0)) to stage 3 (n = 3 (3.6%)). Types of gynaecological cancer included n = 43 (51.8%) uterine, n = 30 (36.1%) cervical, n = 7 (8.4%) vaginal and n = 3 (3.6%) vulval cancer. Cancer treatment involved surgery (n = 8 (9.6%)), radiotherapy (n = 9 (10.8%)), chemotherapy (n = 8 (9.6%)), combined radiotherapy, chemotherapy and hormones (n = 38 (45.8%)), hormones (n = 14 (16.9%)) and targeted therapy (n = 6 (7.2%)). The main reported reason for using cannabis suppositories involved sexual pain during intercourse (n = 9 (10.8%)), assisting with the use of dilators (n = 8 (9.6%)) and combined sexual pain and dilators (n = 25 (30.1%)), with n = 41 (49.4%) reporting it as not applicable. N = 15 (21.7%) participants used oestrogen gel during sexual intimacy. Among those using THC suppositories, n = 37 (44.6%) had acquired a formal prescription but reformulated it themselves into a suppository. Suppositories were mainly used every 2 weeks (n = 22 (26.5%)), weekly (n = 13 (15.7%)) and more than weekly (n = 12 (14.5%)). The duration of vaginal insertion of the cannabis suppositories before sexual intercourse was n = 20 (24.1%)—30 min beforehand, n = 18 (21.7%)—between 30 and 60 min, n = 4 (4.8%)—over 60 min, with n = 41 (49.4%) reporting that it was not applicable. Dosages varied; for n = 11 (13.3%) it was 100 mg, for n = 10 (12.0%), 500 mg, for n = 16 (19.3%), 1000 mg and n = 5 (6.0%) were unsure, with n = 41 (49.4%) reporting it as not applicable. No condoms were used among n = 62 (74.7%) of the cohort, n = 12 (14.5%) used regular condoms (waiting for the oil to dissipate), and n = 9 (10.8%). Use of THC suppositories was reported in n = 12 (14.5%), CBD suppositories, in n = 11 (13.3%) and combined THC/CBD suppositories, in n = 19 (22.9%), with n = 41 (49.4%) reporting it as not applicable.

**Table 1.** Demographic features of the sample.

		N = 83 (n)	%
CO		21	
MC		21	
COMC		21	
CAU		20	
<hr/>			
Age	18–30	11	13.3
	31–50	51	61.4
	>51	21	25.3
Menopause, including early menopause		43	51.8
<hr/>			
Ethnicity	White	52	62.7
	African Caribbean	30	36.1
	Pakistani	1	1.2
<hr/>			
Sexuality	Straight	77	92.8
	Bisexual	6	7.2

Table 1. Cont.

	N = 83 (n)	%
Relationship status (years)		
0–1	7	8.4
1–2	15	18.1
3–5	11	13.3
>5	29	34.9
Not partnered	21	25.4
Outsider cannabis suppository use, Illicit drug use included		
None	53	63.9
Cocaine	7	8.4
Amphetamine/speed	4	4.8
Outside of post-cancer treatments		
No medication	44	53
Herat medication	26	31.3
Insulin	13	15.7
Alcohol Use		
None	23	27.7
<14 units	49	59
>14 units	11	13.3
Exercise		
None	42	50.6
Approximately 3 times per week	15	18.1
Weekly	18	21.7
Not stated	8	9.6
Stage of cancer at the time of cancer treatment		
Stage 1	41	49.4
Stage 2	39	47
Stage 3	3	3.6
Type of gynaecological cancer		
Uterine	43	51.8
Cervical	30	36.1
Vaginal	7	8.4
Vulva	3	3.6
Cancer treatment		
Surgery	8	9.6
Radiotherapy	9	10.8
Chemotherapy	8	9.6
Combined radiotherapy, chemotherapy and hormones	38	45.8
Hormones	14	16.9
Targeted therapy	6	7.2
Use of Cannabis suppositories		
THC	12	14.5
CBD	11	13.3
THC/CBD combined	19	22.9
Not applicable	41	49.4
Estimated dose of cannabis suppository (mg)		
100	11	13.3
500	10	12
1000	16	19.3
Unsure	5	6
Not applicable	41	49.4
Frequency of use of cannabis suppositories		
Every 2 weeks	22	26.5
Weekly	13	15.7
More than weekly	12	14.5
Not applicable	41	49.4

Key: Cannabis-only group (CO); mindful compassion group (MC). Cannabis suppositories and mindful-compassion group adjuncts (COMC) and care as usual (CAU).

The following exclusion criteria formed part of this study.

### 2.2.1. Inclusion Criteria

- Participants should be at least six months or more post-cancer treatment (excluding hormone treatment).
- If applicable, each participant had been using cannabis (THC, CBD, THC/CBD adjunct) suppositories for at least one month.
- Participants should be registered with a general practitioner (GP)
- Sexual functioning involving vaginal sex was satisfactory before cancer diagnosis (acquired).
- Participants were attempting sexual intimacy.
- Participants were aged 18 years or older.
- Participants were fluent in reading and writing English (as this is a clinical trial, we wanted to ensure that participants fully understood what was expected of them).
- A patient health questionnaire-PHQ-9 score of between 0 and 9 [25].

### 2.2.2. Exclusion Criteria

- Applicants were currently receiving cancer treatment, such as radiation therapy or chemotherapy.
- Applicants were not registered with a GP.
- Applicants were sexually abstinent.
- Applicants were aged under 18 years old.
- Sexual functioning involved anal sex
- Applicants showed difficulties in reading and writing English.
- Applicants had lifelong sexual function difficulties.
- Applicants had a PHQ-9 score range between 10 and 27.

## 2.3. Mindful Compassion Intervention

Mindful compassion exercises are intended not only to support increased sexual well-being and sexual self-efficacy [26] but also to manage sexual pain. The main exercises included mindfulness, breathing, relaxation techniques and body scans. These exercises incorporate the three-model system of emotions and how to attend to the cognitive and physiological patterns associated with sexual functioning. This intervention was based on the behavioural taxonomy of selected behaviour change techniques (BCTTv1) [27]. The intervention was adapted for this study but was previously tested among different mindfulness cohorts [16,24,28].

## 2.4. Self-Report Measures

### 2.4.1. Demographic Information

Demographic information included gynaecological cancer, stage of cancer, cancer treatments used, engagement in vaginal or anal sex, sexual difficulties, partnered status, ethnicity, sexuality, age, type of cannabis use (THC, CBD, none), frequency of cannabis suppository use, prescription medication, exercise use, alcohol consumption and illicit drug use.

### 2.4.2. Patient Health Questionnaire (PHQ-9) [25]

The PhQ-9 [25] was used to screen for depression. The internal reliability was within the range of 0.86–0.89, which indicates good reliability. The 9-item measure requests participants to rate the regularity of present difficulties during the past 2 weeks (e.g., “Trouble falling or staying asleep or sleeping too much”). Scores indicate the presence and the severity of the depression, with a maximum score of 27 and a minimum score of 0.

### 2.4.3. The Female Sexual Function Index (FSFI) [29]

The FSFI [29] is a 19-item measure of sexual pain, sexual desire, orgasm, lubrication and sexual satisfaction, with five response categories. Example questions include: “Over the past 4 weeks, how often did you experience discomfort or pain during vaginal penetration?”

and “Over the past 4 weeks, how would you rate your level (degree) of discomfort or pain during or following vaginal penetration?”; Cronbach’s  $\alpha = 0.820$  and higher. In the present study, Cronbach’s  $\alpha = 0.750$ .

#### 2.4.4. Adapted Sexual Self-Efficacy Scale for Female Sexual Functioning (SSES-F) [30]

This is a 37-item measure that embraces aspects of female sexuality such as arousal, desire, orgasm, pain and satisfaction. The SSES-F [30] has 10 response categories. Example questions include anticipating (thinking about) having intercourse without fear or anxiety and engaging in intercourse without pain or discomfort; Cronbach’s  $\alpha \geq 0.930$ . In the present study, Cronbach’s  $\alpha = 0.852$ .

#### 2.4.5. The Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS) [31]

This is a seven-item questionnaire with five response categories, looking at functioning and feeling aspects of well-being. An example question includes: “I’ve been feeling relaxed”. In the present study, Cronbach’s  $\alpha = 0.834$ .

#### 2.4.6. Brunnsvikén Brief Quality of Life Scale (BBQ) [32]

This is an eight-item questionnaire with five response categories, looking at satisfaction with self, friends, family and creativity. Example responses include “how I view my life as necessary for my quality of life”, and “I am satisfied with my friends and friendship”; Cronbach’s  $\alpha = 0.760$ . In the present study, Cronbach’s  $\alpha = 0.789$ .

#### 2.4.7. State Self-Compassion (with Mindfulness) Short Form [33]

This is a 12-item measure with 5 response categories, where 1 = almost never, to 5 = almost always, with higher scores indicating higher levels of self-compassion. The questionnaire measures self-kindness vs. self-judgement, common humanity vs. isolation, and mindfulness vs. over-identification with painful thoughts and emotions. Reliability scores for Cronbach’s alpha ranged between 0.680 and 0.780.

#### 2.4.8. Feedback Questions

Mentimeter (Mentimeter, Stockholm, Sweden) feedback questions were asked throughout this study, as part of the content analysis. The responses from week 12 have been provided. The questions used were sourced from a prior study examining sexual pain among men who have sex with men (MSM) and who experience anodyspareunia [23]. The responses deemed relevant to this cohort in future healthcare planning have been included to avoid repetition.

### 2.5. Procedure

The intervention was registered with [clinicaltrials.gov](https://clinicaltrials.gov), NCT06607835, and was ethically approved by a university ethics review panel. This study was conducted under the British Psychological Society (BPS) Code of Ethics and Conduct [34]. Details of the study were made available online via LinkedIn and TikTok. The PHQ-9 was used as a screening tool for this study’s inclusion and exclusion criteria. Eligible consenting participants were randomly allocated to a group, based on whether they were using cannabis suppositories. This criterion was chosen owing to the legalities associated with cannabis in the UK. All participants completed baseline assessments at week 0. This was repeated at weeks 4 and 12. The ordering used for the online Microsoft survey (Microsoft®, Redmond, WA, USA) was as follows: The Female Sexual Function Index; Adapted Sexual Self Efficacy Scale for Female Sexual Functioning; Short Warwick–Edinburgh Mental Wellbeing Scale; Brunnsvikén Brief Quality of Life Scale and State Self-compassion Scale, followed by the debrief, including additional support services and a complaints contact form. Feedback on the intervention was sought throughout this study using Mentimeter (Mentimeter, Stockholm, Sweden) at weeks 0, 4 and 12. The online delivery of the mindful compassion intervention was conducted over 4 weeks (1 h per session) for the MC and COMC. Data were stored in

OneDrive (Microsoft®, WA, USA), based at the University, and were managed according to the Data Protection Act (2018).

## 2.6. Statistical Analysis

A Cronbach's alpha analysis was conducted on the assessments included in this study.

A repeated-measures ANOVA on sexual pain, sexual function, mindful compassion, quality of life and well-being (IV) compared the means of these variables at 0, 4, and 12 weeks (follow-up) for all groups. A post hoc test using Friedman's two-way ANOVA K samples was conducted on statistically significant outcomes. An ANOVA determined the differences in these variables between all groups. Furthermore, a MANOVA compared the use of THC, CBD and a combination of THC/CBD with levels of vaginal sexual functioning and pain. A subsequent MANCOVA explored this finding further but controlled for the dosages of cannabis suppository use. A nonparametric content analysis was conducted on the collated feedback from participants at weeks 0, 4 and 12. Week 12 has been included in this study. The effect size was partial eta squared, combined with 95% confidence intervals (95% CI). For the content analysis, it was decided to include only week 12's feedback to establish the intervention's ongoing outcomes and report the most significant/highest outcomes, as these would inform the development of this intervention. Statistical analysis was conducted using SPSS version 28.0 [IBM, Armonk, NY, USA].

## 3. Results

### 3.1. The Impact of Time on Mindful Compassion, Sexual Functioning, Sexual Self-Efficacy, Well-Being and Quality of Life

Regarding the CO group, there was an effect of time on sexual functioning at weeks 0 to 12, where  $F(2, 15) = 12.933$ ,  $p \leq 0.001$ ,  $\eta_p^2 = 0.633$ , CI: 18.356–23.64. Among the sexual functioning variables, including sexual desire, sexual arousal, lubrication, orgasm, sexual satisfaction and sexual pain, sexual pain was significant between weeks 0 and 12, where  $F(2, 15) = 11.239$ ,  $p \leq 0.001$ ,  $\eta_p^2 = 0.600$ , CI: 7.006–4.630. The remaining sexual functioning variables were non-significant, where  $p > 0.05$ . There was an effect of time on well-being at weeks 0 to 12, where  $F(1, 16) = 21.361$ ,  $p \leq 0.001$ ,  $\eta_p^2 = 0.572$ , CI: 17.505–21.319. There was an effect of time on sexual-self efficacy, where  $F(2, 15) = 8.190$ ,  $p = 0.004$ ,  $\eta_p^2 = 0.522$ , CI: 13.759–15.758. There was no effect on time for mindful compassion or QOL, at  $p > 0.05$ . Post hoc tests for sexual functioning, sexual pain, well-being and sexual self-efficacy were significant, at  $p < 0.05$ . There was an overall interaction effect with sexual function and well-being, mindful compassion, sexual self-efficacy and QOL, where  $F(7, 10) = 175.582$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.996$ , CI: 4.630–21.319. Post hoc tests across all variables were significant, at  $p < 0.001$ .

Concerning the MC group, there was an effect of time on sexual functioning at weeks 0 to 12, where  $F(2, 16) = 9.394$ ,  $p = 0.002$ ,  $\eta_p^2 = 0.540$ , CI: 20.543–25.471. Among the sexual functioning variables, including sexual desire, sexual arousal, lubrication, orgasm, sexual satisfaction and sexual pain, sexual arousal was significant between weeks 0 and 12, where  $F(2, 16) = 5.757$ ,  $p = 0.013$ ,  $\eta_p^2 = 0.419$ , CI: 3.261–4.998; lubrication was significant between weeks 0 and 12, where  $F(1, 17) = 5.591$ ,  $p = 0.013$ ,  $\eta_p^2 = 0.247$ , CI: 3.621–5.101 and orgasms were significant between weeks 0 and 12, where  $F(2, 16) = 4.382$ ,  $p = 0.030$ ,  $\eta_p^2 = 0.354$ , CI: 1.453–3.144. Sexual desire, sexual satisfaction and sexual pain were non-significant at  $p > 0.05$ . There was an effect of time on well-being at weeks 0 to 12, where  $F(2, 16) = 46.241$ ,  $p \leq 0.001$ ,  $\eta_p^2 = 0.853$ , CI: 15.413–23.781; sexual self-efficacy,  $F(2, 16) = 61.517$ ,  $p \leq 0.001$ ,  $\eta_p^2 = 0.885$ , CI: 14.234–26.897; mindful compassion,  $F(2, 16) = 34.910$ ,  $p \leq 0.001$ ,  $\eta_p^2 = 0.814$ , CI: 21.256–34.859 and QOL,  $F(2, 16) = 3.954$ ,  $p = 0.04$ ,  $\eta_p^2 = 0.331$ , CI: 15.291–20.646. Post hoc tests on sexual functioning, sexual arousal, lubrication, orgasm, sexual self-efficacy, mindful compassion and QOL were significant at  $p < 0.05$ . There was an overall interaction effect with sexual function and well-being, mindful compassion, sexual self-efficacy and QOL, where  $F(4, 14) = 66.340$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.950$ , CI: 20.219–25.471. Post hoc tests for

sexual function and mindful compassion and QOL were significant at  $p < 0.001$ , but not significant for sexual function and well-being and sexual self-efficacy, at  $p > 0.05$ .

Regarding the COMC group, there was an effect of time on sexual functioning at weeks 0 to 12, where  $F(2, 16) = 20.792$ ,  $p \leq 0.001$ ,  $\eta_p^2 = 0.722$ , CI: 20.543–28.787. Among the sexual functioning variables, including sexual desire, sexual arousal, lubrication, orgasm, sexual satisfaction and sexual pain, sexual arousal was significant between weeks 0 and 12, where  $F(2, 16) = 9.780$ ,  $p = 0.002$ ,  $\eta_p^2 = 0.550$ , CI: 3.261–5.224; lubrication was significant between weeks 0 and 12, where  $F(1, 17) = 13.600$ ,  $p = 0.002$ ,  $\eta_p^2 = 0.444$ , CI: 3.822–5.512; orgasms were significant between weeks 0 and 12, where  $F(2, 16) = 8.063$ ,  $p = 0.004$ ,  $\eta_p^2 = 0.502$ , CI: 1.453–3.771 and sexual pain was significant (reduced) between weeks 0 and 12, where  $F(2, 16) = 6.694$ ,  $p = 0.008$ ,  $\eta_p^2 = 0.456$ , CI: 7.084–5.360. Sexual desire and sexual satisfaction were non-significant at  $p > 0.05$ . There was an effect on time on well-being at weeks 0 to 12, where  $F(2, 16) = 70.998$ ,  $p \leq 0.001$ ,  $\eta_p^2 = 0.899$ , CI: 12.364–25.270; sexual self-efficacy,  $F(2, 16) = 63.821$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.889$ , CI: 14.230–28.717; mindful compassion,  $F(2, 16) = 37.984$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.826$ , CI: 21.256–39.517 and QOL,  $F(2, 16) = 4.975$ ,  $p = 0.021$ ,  $\eta_p^2 = 0.383$ , CI: 15.219–20.646. Post hoc tests on sexual functioning, sexual arousal, lubrication, orgasm, sexual pain, sexual self-efficacy, mindful compassion and QOL were all significant at  $p < 0.05$ . There was an overall interaction effect with sexual function and well-being, mindful compassion, sexual self-efficacy and QOL, where  $F(4, 14) = 58.483$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.944$ , CI: 22.285–28.787. Post hoc tests for sexual function and well-being were significant, at  $p > 0.005$ , and for mindful compassion and QOL,  $p > 0.001$ , but not for sexual self-efficacy, at  $p > 0.005$ .

Regarding the CAU group, there was an effect of time on well-being at weeks 0 to 12, where  $F(2, 14) = 11.974$ ,  $p \leq 0.001$ ,  $\eta_p^2 = 0.527$ , CI: 23.612–19.174 and sexual self-efficacy, where  $F(2, 14) = 13.455$ ,  $p = 0.004$ ,  $\eta_p^2 = 0.383$ , CI: 15.219–20.646. Post hoc tests revealed significance in the diminishing levels of well-being and sexual self-efficacy, at  $p > 0.05$ . There was no effect on time on the sexual function variables, mindful compassion or QOL, at  $p > 0.05$ . However, the QOL value was borderline. There was an overall interaction effect, where  $F(4, 12) = 19.375$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.866$ , CI: 15.826–18.360. Post hoc tests on sexual self-efficacy were non-significant. Interestingly, QOL decreased at  $p = 0.022$ , and well-being at  $p < 0.001$ .

### 3.2. Comparisons Across Groups

When comparing across the groups, CAU, CO, MC, and COMC, for well-being at week 12,  $F(3, 13) = 11.486$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.726$ , CI: 17.190–25.452. Post hoc tests on CAU with CO were non-significant, at  $p > 0.05$ , but were significant with MC, at  $p = 0.012$  and COMC, at  $p < 0.001$ . Additionally, significant outcomes were observed between CO and COMC, at  $p < 0.05$ . There were no further significant post hoc outcomes. When comparing mindful compassion groups,  $F(3, 13) = 202.624$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.979$ , CI: 19.025–40.028. Post hoc tests on CAU with CO, MC and COMC were significant, at  $p < 0.001$ . There was no significant difference between MC and COMC, at  $p > 0.05$ . When comparing groups' sexual self-efficacy at week 12,  $F(3, 13) = 41.657$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.906$ , CI: 15.506–27.980. Post hoc tests on CAU with CO were significant, at  $p > 0.05$ , and significant with MC and COMC, at  $p < 0.001$ . Additionally, significant outcomes were observed for CO and MC and CO with COMC, at  $p < 0.001$ . When comparing sexual functioning among the groups,  $F(3, 13) = 53.265$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.925$ , CI: 18.306–29.240. Post hoc tests were significant for CAU and all groups, at  $p < 0.001$ . Additional significant outcomes were found with CO and MC and with MC and COMC, at  $p \geq 0.05$ , along with CO and COMC, at  $p < 0.001$ . Sexual arousal was non-significant across groups, where  $F(3, 13) = 2.381$ ,  $p = 0.117$ ,  $\eta_p^2 = 0.355$ , CI: 4.885–5.262. Lubrication was significant across groups, where  $F(3, 13) = 11.839$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.732$ , CI: 3.493–5.635. Post hoc tests for CAU with CO and MC were significant, at  $p > 0.05$ , and significant for COMC, at  $p < 0.001$ . A significant outcome was observed with CO and COMC, at  $p \leq 0.05$ . Orgasms were non-significant across groups, where  $F(3, 13) = 2.517$ ,  $p \geq 0.05$ ,  $\eta_p^2 = 0.367$ , CI: 2.955–4.018. Sexual satis-

faction was significant across groups, where  $F(3, 13) = 11.854, p < 0.001, \eta_p^2 = 0.732$ , CI: 3.294–5.674. Post hoc tests for CAU with MC were significant, at  $p > 0.05$ , and for COMC, at  $p < 0.001$ . An additional significant outcome was observed with MC and COMC, at  $p < 0.001$ . Sexual pain was significant across groups, where  $F(3, 13) = 18.984, p < 0.001, \eta_p^2 = 0.814$ , CI: 3.335–7.596. Post hoc tests for CAU with CO were significant, at  $p < 0.05$ , and MC and COMC at  $p < 0.001$ . Additional significant outcomes were CO and MC with COMC, at  $p < 0.001$  and MC and COMC, at  $p < 0.05$ . QOL was non-significant across groups at week 12, where  $F(3, 13) = 0.925, p = 0.420, \eta_p^2 = 0.117$ , CI: 12.572–17.575.

3.3. Sexual Functioning with the Use of THC and CBD Suppositories

There was a statistically significant interaction effect between the doses of THC and CBD suppositories and how often these were used in the COMC group than the CO group for sexual satisfaction, where  $F(1, 16) = 18.375, p = 0.023; \eta_p^2 = 0.860$ . There was an interaction effect between the THC/CBD dose and duration of use before sexual functioning in the COMC than the CO group for overall sexual functioning, where  $F(1,16) = 11.344, p = 0.044; \eta_p^2 = 0.791$ ; for sexual satisfaction,  $F(1, 16) = 18.000, p = 0.024, \eta_p^2 = 0.857$  and for sexual pain,  $F(1, 16) = 11.605, p = 0.042, \eta_p^2 = 0.795$ . For sexual functioning in the COMC group, post hoc tests were significant for combined THC/CBD use at 1000 mg, at  $p < 0.05$ , and approximately 30 min before intimacy for sexual pain, at  $p < 0.05$ . When the cannabis dosages were controlled using MANCOVA for sexual pain and sexual satisfaction in the COMC, the outcomes were significant, at  $p < 0.05$  (see Table 2).

**Table 2.** The means (M) and standard deviations (SD) of the group’s CO, MC, COMC, and CAU before (week 0) and after (weeks 4 and 12) intervention for sexual function, mindful compassion, sexual self-efficacy, well-being and QOL. Significant differences have been included for weeks 0 to 12.

Week	CO		MC		COMC		CAU		
	M	SD	M	SD	M	SD	M	SD	
	Sexual function								
0	20.29	3.196	22.90	4.134	22.91	4.136	17.60	3.050	
4	21.48	3.219	23.24	3.048	23.76	2.965	17.56	2.895	
12	21.88 **	3.407	24.440 *	2.064	27.17 **	3.258	16.54	2.670	
	Sexual desire								
0	2.19	1.030	2.38	0.921	2.33	0.856	1.90	0.788	
4	2.38	0.921	2.43	0.870	2.38	0.921	1.89	0.758	
12	2.35	0.786	2.56	0.616	2.57	0.659	1.87	0.719	
	Sexual arousal								
0	4.71	1.554	3.90	1.136	3.91	1.156	4.25	1.164	
4	4.67	1.550	4.19	0.928	4.24	0.831	4.33	1.138	
12	4.71	1.047	4.61 *	0.788	4.38 *	0.786	4.38	0.957	
	Lubrication								
0	3.67	1.390	4.00	1.095	4.19	1.03	2.80	1.322	
4	3.90	1.179	4.49	1.096	4.19	1.03	2.94	1.259	
12	3.88	1.166	4.56 *	1.097	5.00 *	1.029	2.81	1.276	
	Orgasms								
0	2.05	1.244	2.05	1.244	2.05	1.244	2.80	1.322	
4	3.10	1.091	2.19	1.25	2.38	1.284	2.94	1.256	
12	3.88	1.166	2.50 *	1.295	2.94 *	1.662	2.81	1.276	
	Sexual satisfaction								
0	3.10	1.221	4.00	1.871	4.11	1.623	2.80	1.105	
4	3.67	1.713	4.05	1.746	4.10	1.609	2.67	1.085	
12	3.94	1.952	4.06	0.988	5.00	1.188	2.69	1.138	
	Sexual pain								
0	6.57	1.832	6.57	1.832	6.83	1.543	6.2	2.042	
4	4.00	1.225	6.38	1.396	6.57	1.832	6.22	1.734	
12	3.76 **	1.261	6.17	1.2	4.06 *	1.955	6.19	1.759	



Table 2. Cont.

Week	CO		MC		COMC		CAU	
	M	SD	M	SD	M	SD	M	SD
Mindful compassion								
0	23.24	5.873	23.71	6.597	24.01	5.161	17.50	3.935
4	22.76	5.309	34.10	3.145	36.48	3.669	17.17	3.746
12	22.06	5.771	36.78 **	3.859	37.56 **	3.944	17.00	3.596
Well-being								
0	18.86	4.078	13.33	3.152	13.39	3.162	21.80	3.563
4	22.81	3.487	16.86	3.439	19.67	3.411	19.50	3.015
12	19.41 **	3.709	22.00 **	3.581	23.78 **	3.001	17.50 **	3.141
Sexual self-efficacy								
0	15.19	2.502	15.38	2.156	15.38	2.156	18.00	3.325
4	15.86	2.762	22.33	3.246	23.62	3.413	17.39	2.831
12	17.65 *	3.673	25.39 **	3.032	26.72 *	4.012	15.06 *	2.048
Quality of life								
0	18.81	4.697	17.10	3.048	17.60	4.144	21.60	5.423
4	19.10	4.504	18.86	2.651	19.62	2.889	21.56	4.949
12	20.24	1.505	19.17 *	2.975	19.18 *	2.959	21.31	4.827

\* Significant at  $p < 0.05$ . \*\* Significant at  $p < 0.001$ .

### 3.4. CO Group (n = 17 Participant Responses)

In total, 70.6% of participants felt that their sexual functioning was the same pre- and post-study. However, they felt that using cannabis suppositories had helped them with relaxation (reduced anticipation of pain) during the sexual act (94.1%, n = 16), which increased their sexual connection with their partners (58.8%, n = 10). Participants voiced the need to have more widely available THC suppositories in healthcare (47.1%, n = 8) rather than having to make them up themselves (35.2%, n = 6). When asked about using condoms with cannabis suppositories, limited use was mainly attributed to being in a long-term relationship (52.9%, n = 9) but with some uncertainty about where to obtain oil-resistant condoms (23.5%, n = 4). In terms of using cannabis suppositories, 23.5% (n = 4) cited the use of dilators (sometimes sex toys, including dildos, were used), better sex (23.5%, n = 4) and increased sexual wellbeing, including intimacy and masturbation, were reported (17.5%, n = 3). There appeared to be confusion about using oestrogen gel as a lubricant and concerns about their cancer returning (52.9%, n = 9), with participants often feeling conflicted about whether oestrogen gel was safe to use (47.1%, n = 8).

### 3.5. MC Group (n = 18 Participant Responses)

In total, 72.2% (n = 13) of participants suggested that mindful compassion helped with relaxation and remaining in the moment (83.3%, n = 15), which improved their sexual experiences (77.8%, n = 14). Furthermore, 44.4% (n = 8) reported feeling uncertain about using oestrogen gel but would continue to use their regular lubrication with mindful compassion (27.8%, n = 5). Elsewhere, 22.2 (n = 4) stated that they would consider using mindfulness before using dilators as part of their treatment programme (22.2%, n = 4). In addition, 50.0% (n = 9) felt that it was important for the National Health Service to provide treatment options such as mindful compassion and cannabis suppositories (16.7%, n = 3).

### 3.6. COMC Group (n = 18 of Participant Responses)

In total, 33.3% (n = 6) of participants felt more confident and better after the mindful compassion and cannabis suppository intervention. This was closely followed by feeling more relaxed (27.8%, n = 5). In the group, 50.0% (n = 9) felt that mindful compassion increased the pain-reducing effects of cannabis, which assisted with sexual functioning (33.6%, n = 6). The participants' lack of condom use was attributed to being in a long-term relationship (50.0%, n = 9), but some felt that there was a lack of information on oil-resistant condoms (41.1%, n = 7). Participants explained that "it's easy to get CBD suppositories. I

mix medical cannabis with CBD suppositories" (72.2%, n = 13), and "I will sometimes mix non-prescribed cannabis oil with CBD suppositories" (27.8%, n = 5). Participants felt that a variety of medical cannabis products should be available in NHS practice (77.8%, n = 14).

### 3.7. CAU Group (n = 16 of Participant Responses)

There were no differences in sexual functioning for this group. All participants understood their role as the control group and were keen to attend an experimental group post-research study. The team offered mindful compassion group sessions after completing the research to ensure that all groups experienced some perceived improvement. The CO group was offered the same opportunity and appeared content with using cannabis only but was keen to be part of an experimental group in the future.

All groups were asked, "If you had a message to the healthcare team and the team in this study about your treatment regarding sex, what would that be?"

Based on all the group's participant responses, n = 54, participants raised the issue of dilators for sexual pain. They suggested that more experimentation with sex toys would be preferable and that perhaps this should have been part of this study's intervention (38.9%, n = 21). They suggested that gynaecological cancer had diminished their sense of womanhood and sexuality. Dilators, being a medicalised intervention for sexual difficulties, further took away their feeling of sexual attractiveness; hence, they did not engage in standard treatment involving dilators (33.3%, n = 18). They also requested that sexual intimacy be discussed more readily in healthcare as it felt like "a taboo subject" (16.7%, n = 9). Some participants stated that the current study did not use many pictorial examples of female genitalia, which would have been very useful for how "we reconnect with this part of our body, along with the use of sex toys and sexual intimacy with our partners" (11.1%, n = 6).

## 4. Discussion

This study aimed to generate an understanding of how a brief online group-based mindful compassion intervention, combined with cannabis suppositories, might support sexual function and QOL among women after gynaecological cancer. The hypotheses were partially supported. For example, the hypotheses stated that there would be a significant effect of time on sexual self-efficacy, mindful compassion, sexual functioning, well-being and QOL among groups using cannabis suppositories and/or mindful compassion. This hypothesis was supported, but there were variations in how mindful compassion and cannabis suppositories impacted these variables where mixed sexual function outcomes were reported. Overall, the CAU group was non-significant; however, well-being and sexual self-efficacy diminished. Post hoc tests revealed differences across groups with sexual function, sexual-self efficacy, well-being and mindful compassion with the CAU group, compared to the CO, MC and COMC groups.

### MC and COMC Groups

The CO group experienced a reduction in sexual pain, but no other sexual functioning variable was significant. When comparing the outcomes with previous work [24], sexual functioning in a group of 52 MSM levels of sexual pain did not change significantly in the cannabis suppository-only group over 12 weeks. The current sample was larger and, compared to the previous study, more information was available on participants' cannabis suppository dose and frequency of use, along with anatomical differences. As seen in a previous work [23], levels of well-being and sexual self-efficacy increased from weeks 0 to 12 when using cannabis.

The MC group reported higher levels of sexual arousal, lubrication and orgasms post-intervention. Similarly to a study looking at an online group intervention for women with sexual desire and arousal difficulties, the outcomes showed increased levels of mindfulness post-intervention at 11 weeks [8,35]. Additionally, the effect sizes for lubrication and orgasm were smaller than for sexual arousal. However, compared to Brotto's [35] outcomes,

pain levels did not decrease over time in the current study. The participants in this study stated that having their partners involved in the delivery of the mindfulness intervention might improve overall sexual functioning. Similarly, levels of sexual pain among MSM in the MC group did not diminish over time [24]. Indeed, the outcomes in this study are contrary to outcomes in which mindfulness has consistently been shown to reduce sexual pain [15,36]. However, as seen in a previous study [14], well-being and QOL improved.

The outcomes favoured the COCM group in which sexual function, levels of sexual arousal, lubrication, and orgasm increased, and levels of sexual pain decreased at week 12. Similar outcomes were reported among MSM for sexual pain in the combined cannabis suppository and mindful compassion group. Additionally, mindful compassion, sexual self-efficacy and QOL improved post-intervention [16,24,28].

Mindfulness has been shown to increase levels of sexual self-efficacy, well-being, sexual functioning and QOL [14,16,24,28]. A relationship has been established between sexual self-efficacy and improved sexual functioning and relationship connection [37]. Early menopause was evident in some of the participants in this study. In a study looking at the effects of mindfulness on sexual self-efficacy and sexual satisfaction among  $n = 110$  postmenopausal Iranian women (with  $n = 55$  allocated to the mindfulness experimental group and  $n = 55$  to a control group with no mindfulness intervention over 8 weeks), outcomes favoured the mindfulness group, who showed increased levels of sexual functioning and sexual self-efficacy [38].

Regarding cannabis and sex, THC might act as a vasodilator, allowing more blood flow to the vagina, increasing sexual pleasure [39]. When comparing suppository use with THC, CBD or combined THC/CBD, the combined CBD and THC treatment was favoured among participants in this study. However, this might be owing to the limited availability of THC suppositories in healthcare, such as from the NHS. Therefore, this may have artificially increased the dose to 1000 mg. To elucidate, participants would combine separately obtained THC (e.g., cannabis oil) with ready-made CBD suppositories. Interestingly, 500 mg of THC was also favoured over CBD (500 mg). The outcomes still favoured THC and CBD-combined suppositories to address sexual pain when dosages were controlled. However, further research involving randomisation to sham and controlled dose groups would provide better insight into the dosages required for sexual intimacy and dosage use with dilators. Comparable research is scarce; however, the outcomes looking at THC/CBD among MSM with anodyspareunia were non-significant, possibly due to the small sample size and a lack of information about dosages [24].

The use of suppositories is not a new way of delivering medication. One study [40] evaluated the safety of increasing doses of THC rectal suppositories among male participants and compared the pharmacokinetics of oral administration versus an equivalent amount of rectal suppository, delivered as THC-HS. Outcomes looked promising concerning safety and tolerance. Systemic exposure to cannabis via rectal suppositories (THC) was higher compared to the oral use of THC, where plasma concentrations in rectal suppositories were 2.44-fold higher than with capsule administration. Rectal cannabis suppositories result in reduced feelings of intoxication compared to oral use, as the effects are more localised. In this study, participants suggested that mindful compassion increased the effects of the cannabis suppository. In one study of 47 participants using oral cannabis and engaging in 45 min of yoga, they demonstrated significant improvements in meditation [40]. This finding holds important clinical implications, such as the use of cannabis suppositories to assist with using dilators as part of post-gynaecological cancer treatment. Research is scarce in examining the impact that dilators have on female sexuality, and concerns have been raised about dilators being associated with performance-based sexuality, which could have a detrimental effect [41]. In a qualitative interview-based study of 13 women being treated for vaginismus using an interpretive phenomenological approach (IPA), 4 superordinate themes were obtained, including a lack of knowledge, invalidation of suffering by professionals, a difficult journey (treatment process) and making the journey easier [42]. Making the journey easier included partner-based and professional support.

In the current study, participants referred to the medicalising properties of using dilators and the negative impact that this had on sexuality, resulting in non-engagement. This appeared to be compounded among those who were pre- or post-menopausal. Reference to using sex toys was made, and yet research into using sex toys such as dildos instead of dilators or using vibrators with dilators is scarce. However, NHS Gloucestershire, in the UK, stated that vaginal dilation can be obtained by using sex toys [43]. Those using cannabis suppositories suggested that the use of dilators was easier. While speculative, the cannabis suppository acted as a lubricant, coupled with pain management.

The limitations of this study are based on ethical and legal cannabis restrictions in the UK. Ideally, medical cannabis should become more readily available on the NHS, including cannabis suppositories. Current NHS prescriptions include epilepsy, chemotherapy, and multiple sclerosis [1]. This limits randomisation to sham and dose-managed groups, along with frequency of use, which would provide a more accurate means of determining the analgesic properties of cannabis. Owing to how the randomisation took place, there was a lack of information on how the suppositories were being used, such as washout. Further, randomisation might have had an anticipatory placebo effect, which impacted participant outcomes [44]. Because controlled randomisation to dose-specific cannabis suppository groups was impossible, owing to the legal restrictions/applications of THC compounds in the UK, the outcomes of this study should be interpreted cautiously. Perhaps a good starting point would be the randomisation of CBD suppositories for sexual pain. Therefore, as a preliminary study, the sample size is adequate, but a larger sample would be required for it to become applicable to the broader population of women with gynaecological cancer. In our study, levels of lubrication had improved. However, this might have been due to an oil-based suppository or to the placebo effect mirrored in the self-report measures [45]. Perhaps the use of a vaginal photoplethysmograph or a Schirmer tear test strip might provide a better understanding. A waiting period for the cannabis suppositories to be absorbed would be needed, as this could give a false positive outcome in the Schirmer test. This would require further research; nonetheless, a novel and potentially more accurate measure of lubrication in participants pre- and post-intervention assessment would be needed [46]. Obtaining support for the current study came with challenges. Therefore, participant recruitment was restricted to social media sites. The research was correct in how randomisation was employed; however, participant bias might have been an outcome [47]. Participants as co-collaborators input into the intervention suggested more pictorial representations of the vagina were needed to contextualise the intervention. Plus, there was hesitancy with the use of oestrogen gel as a lubricant or to reduce menopause symptoms, as participants felt conflicted about using oestrogen-based products and their association with cancer (the participant's perspective). The team predominately consisted of psychologists; a multi-disciplinary approach, including a medical team, would be required for further developing this intervention from a biopsychosocial perspective. Participants felt that their partners would benefit from attending the intervention as using dilators was "non-sexy" without their partners. This may account for the absence of sexual desire outcomes in this study. Therefore, future research might wish to include a relationship/couples-based mindfulness intervention with a psychosexual therapeutic and medical emphasis. The psychosexual education would also include information about oil-resistant condoms as some participants were unaware of their existence, coupled with a lack of condom use. However, the team acknowledged that those participants stated that they were in long-term relationships.

## 5. Conclusions

This exploratory study aimed to establish whether a brief online mindful-compassion-adjunct cannabis suppository group intervention supported women having difficulties with sexual functioning, sexual self-efficacy, well-being and QOL. Both cannabis suppositories and mindful compassion appear to be effective interventions for women after gynaecological cancer treatment with these variables. The cannabis suppositories appeared to

address sexual pain, and mindful compassion better mediated the analgesic properties of cannabis to support sexual function, well-being, sexual self-efficacy and QOL. Participants did not engage in using their dilators as part of their treatment, suggesting that the use of sex toys combined with cannabis suppositories and/or mindful compassion might be preferable with their partners. As a preliminary study, the outcomes were informative. This intervention requires development through a biopsychosocial lens and with a larger sample. Ideally, medical cannabis will become more readily available so that researchers can randomly allocate participants to dose-specific THC suppository groups for a better understanding of their potential analgesic properties. Since treatment choice is imperative in healthcare, those who do not wish to use cannabis suppositories may prefer engaging with mindfulness practice, which appeared supportive regarding sexual functioning and QOL. These preliminary outcomes look promising and provide a foundation for future research to develop varied healthcare options to improve mental health service delivery and QOL for this cohort.

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# Assessment of the effect of cannabis use before partnered sex on women with and without orgasm difficulty

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## Abstract

**Background:** Up to 41% of women face challenges achieving orgasm, a statistic unchanged for 50 years.

**Aim:** To evaluate the effect of cannabis use before partnered sex on women with and without difficulty achieving orgasm.

**Methods:** This observational study evaluated responses from female study participants relating to their demographics, sexual activities, mental well-being, cannabis usage, and orgasm-related questions from the Female Sexual Function Index (FSFI).

**Outcomes:** Outcomes included orgasm frequency, difficulty, and satisfaction related to cannabis use or lack of use before partnered sex, largely based on the FSFI orgasm subscale.

**Results:** Of the 1037 survey responses, 410 were valid and complete. Twenty-three surveys (5.6% returned) were excluded due to failure to meet the study's criteria. Of the valid surveys, most women (52%,  $n = 202$ ) reported difficulty achieving orgasm during sexual activity with a partner. These women were primarily between 25 and 34 years of age (45%,  $n = 91$ ); 75% identified their race as White ( $n = 152/202$ ); 52% ( $n = 105$ ) identified as LGBTQI+ (lesbian, gay, bisexual, transgender, queer/questioning, intersex, or other); and 82% ( $n = 165$ ) were married or in a relationship. Among participants who experienced challenges in achieving orgasm, 72.8% ( $n = 147$ ,  $P < .001$ ) reported that cannabis use before partnered sex increased orgasm frequency, 67% stated that it improved orgasm satisfaction ( $n = 136$ ,  $P < .001$ ), and 71% indicated that cannabis use made orgasm easier ( $n = 143$ ,  $P < .001$ ). The frequency of cannabis use before partnered sex correlated with increased orgasm frequency for women who experienced difficulties achieving orgasm ( $n = 202$ ,  $P < .001$ ). The reasons for cannabis use before partnered sex resulted in a more positive orgasm response ( $n = 202$ ,  $P = .22$ ).

**Clinical Implications:** Cannabis may be a treatment for women with difficulty achieving orgasm during partnered sex.

**Strengths and Limitations:** The researchers examined the challenge of achieving orgasm and considered the covariates reported in the literature, including the FSFI orgasm subscale. The findings may not be generalizable to women who rarely or never use cannabis before sex, women who have never experienced an orgasm, or women who do not have female genitalia. Additionally, the specific type of cannabis used, its chemical composition, the quantity used, and whether or not the partner used cannabis were not assessed in this study.

**Conclusion:** Cannabis-related treatment appears to provide benefit to women who have female orgasm difficulties or dysfunction.

**Keywords:** female orgasmic dysfunction; female orgasmic disorder; orgasmic dysfunction; female orgasm difficulty; female sexual dysfunction; cannabis and sex; cannabis and female orgasm.

## Introduction

For nearly half a century, researchers have suggested the potential benefits of cannabis in treating female orgasmic dysfunction (FOD) and other sexual maladies.<sup>1–4</sup> Anecdotes and general sexuality research<sup>4–7</sup> suggest that cannabis could treat FOD. This formal investigation focuses on the influence of cannabis on FOD, including medical and recreational usage, regardless of chemical type, dosage, usage timing, and legal status.

FOD is a significant public health concern,<sup>8,9</sup> affecting up to 41% of women worldwide.<sup>10</sup> ICD-11 classifies the condition as “orgasmic dysfunction.” A paucity of treatments exists.<sup>11,12</sup>

Many studies suggest that cannabis can have positive effects on female orgasm,<sup>1,2,5–7</sup> such as enhancing intensity,<sup>1,7,13–16</sup> increasing frequency,<sup>2,4,6,15,17</sup> easing difficulty,<sup>7,13</sup> and improving quality.<sup>2,6,13,15,17,18</sup> Other studies reported possible cannabis inhibition on women's orgasms.<sup>2,14,19</sup> The dosage of cannabis appears to be important, as it

exhibits a dose-dependent relationship to enhanced orgasm response.<sup>2,5,20,21</sup> When appropriately dosed, tetrahydrocannabinol (THC), the primary component of cannabis, can reduce anxiety,<sup>22</sup> potentially leading to improved orgasm and satisfaction during sexual encounters.<sup>23</sup> THC reduces activity in the amygdala and hippocampus, parts of the brain that store and react to trauma.<sup>24</sup> THC also inhibits neural activity in the prefrontal cortex,<sup>25</sup> central to high-level cognitive function, reflecting categories, rules, and cognitive control.<sup>26</sup> Does cannabis use before sex increase orgasm frequency, ease, or satisfaction in women who report orgasm difficulty?

## Methods

In addressing factors related to FOD during partnered sex, we used the term *difficulty* instead of *dysfunction* to reduce negative connotations and allow participants to express their experiences more freely. Quantitative research based on a within-study design was used in this study to establish a

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cause-and-effect relationship and to test the hypothesis that cannabis helps women orgasm who have FOD. The study's survey questions on FOD aligned with the *ICD-11* as "etiological considerations associated with relationship factors" when defining orgasmic dysfunction.<sup>27</sup>

## Participants

We invited sexually active women who used cannabis to complete an anonymous uncompensated 41-question survey via Qualtrics software (Supplement 1) distributed from March 24 until November 18, 2022. *Sexually active* was defined as having sex with a partner within the last 30 days, which may have included a range of sexual activities. As outlined in the approved institutional review board application, participants acknowledged informed consent before beginning the survey. News of the opportunity to participate in the study was posted and promoted through social media and postcards. Relevant ID is an assignment to each participant enabled in the survey to flag duplicate surveys.

Participant eligibility was limited to those who were at least 18 years of age who had used cannabis and were involved in partnered sex within the last 30 days. Exclusions included pregnant women, those breastfeeding, and those who had used other recreational substances during the past month. Participants with other sexual issues were not excluded and had an opportunity to elaborate on such issues in the survey. Other exclusions from the analysis included incomplete surveys, surveys that indicated no use of cannabis before sex, and those that failed to indicate if the respondent had female genitalia.

## Measures

The FSFI<sup>28</sup> orgasm subscale evaluates orgasm frequency, ease, and satisfaction within the last 30 days, with each question having a slider scale of 5 choices. Orgasm frequency ranged from *almost always to always* to *almost never or never*, orgasm difficulty from *extremely difficult to impossible to not difficult*, and orgasm satisfaction from *very satisfied to very dissatisfied*. The same 3 questions and slider scale ranges were asked twice: *with cannabis* before partnered sex, followed by *without cannabis* before partnered sex.

The study evaluated demographic factors, relationship satisfaction, cannabis use behaviors, mental health diagnosis, prescription medication, sexual abuse history, and sexual behavior. Statistical tests provided analytic depth and breadth. Table 1 presents the demographic and clinical characteristics of the participants.

## Analysis

Data analysis occurred between November 20, 2022, and March 27, 2023. The researchers received 1037 survey responses. Forty percent ( $n = 417$ ) failed to meet the inclusion criteria, and 210 were excluded for being incomplete, leaving 410 completed surveys. In addition, 23 surveys indicated that participants never used cannabis before sex or did not clearly state their gender. Thus, 94% ( $N = 387$ ) of completed surveys constituted the primary source of data analyzed.

The grouped responses in reporting *yes* or *no* to the question related to orgasm difficulty during partnered sex determined FOD. Upon evaluation, we moved the responses of 17 women to the category that best reflected their orgasm response without cannabis before partnered sex. For example, we moved a woman's *no* response to orgasm difficulty to the *yes* category

if a respondent stated that she *almost never* or *never* orgasmed without cannabis before partnered sex. As a result of this objective dichotomization, 52% ( $n = 202$ ) of the participants were characterized as having FOD.

The study examined 202 women with FOD and all women with and without FOD ( $N = 387$ ). The study first examined the participants with FOD, and if a statistically significant relationship existed with the use of cannabis before partnered sex, the analysis then turned to all study participants. The only exception to this methodology was for primary intake method, sexual abuse history, and mental health diagnosis. The measurement of these factors was for all women in the study despite the lack of statistical significance found among women with FOD.

The statistical test used in each analysis was based on 2 factors—the level of measurement and the number of treatments—with 3 statistical tests used overall: McNemar, 1-factor analysis of variance (ANOVA), and 1-sample *t*-test. The McNemar test is a nonparametric statistical test for a before-and-after design where a person is one's own control; each has a control and a treatment response. The McNemar test evaluated the paired responses to the FSFI orgasm subscale regarding orgasm frequency, ease, and satisfaction with and without cannabis use before sex.

For orgasm frequency, responses indicating *almost always* or *always*, *most times*, *sometimes*, and a *few times* were combined to represent *yes* to orgasm, while *almost never* or *never* represented *no* to orgasm. Among women with FOD ( $n = 202$ ), responses fell into 4 categories: orgasm with and without cannabis ( $n = 121$ ), orgasm with cannabis and no orgasm without cannabis ( $n = 58$ ), no orgasm with cannabis and orgasm without cannabis ( $n = 7$ ), and no orgasm with or without cannabis ( $n = 16$ ).

For orgasm difficulty, *extremely difficult or impossible*, *very difficult*, *difficult*, and *slightly difficult* were combined to represent the *difficult* category, while *not difficult* represented the *not difficult* category. Among women with FOD ( $n = 202$ ), responses fell into 4 categories: difficult with or without cannabis ( $n = 123$ ), difficult with cannabis and not difficult without cannabis ( $n = 1$ ), not difficult with cannabis and difficult without cannabis ( $n = 70$ ), and not difficult with or without cannabis ( $n = 8$ ). Table 2 represents these data.

For orgasm satisfaction, *very satisfied*, *moderately satisfied*, and *about equally satisfied and dissatisfied* were combined to represent the *satisfied* category, while *moderately dissatisfied* and *very dissatisfied* were combined to represent the *dissatisfied* category. Among women with FOD ( $n = 202$ ), responses fell into 4 categories: satisfied with or without cannabis ( $n = 157$ ), satisfied with cannabis and dissatisfied without cannabis ( $n = 34$ ), dissatisfied with cannabis and satisfied without cannabis ( $n = 3$ ), and dissatisfied with or without cannabis ( $n = 8$ ).

A 1-sample *t*-test or 1-factor ANOVA was used when the measurements were independent with different subjects in each of the groups. The FSFI orgasm subscale, demographics, sexual behavior, mental health, and cannabis use behavior were analyzed.

For orgasm frequency, 2 represented *almost always* or *always* and 6 *almost never* or *never*. Orgasm frequency responses were grouped by scores 2 to 5 as *yes orgasm* and 6 as *no orgasm* with and without cannabis before sex. The *no cannabis* orgasm frequency score was subtracted from

**Table 1.** Demographics, sexual behavior, mental health, sexual abuse history, cannabis use behavior, and cannabis effect on orgasm.

Characteristic	Women, No. (%)		P value: cannabis effect on orgasm based on variable	
	With orgasm difficulty	With + without orgasm difficulty	With orgasm difficulty	With + without orgasm difficulty
No.	202	387		
<b>Demographics</b>				
Age, y			.683	— <sup>a</sup>
18-24	43 (21.3)	76 (19.6)		
25-34	91 (45)	181 (46.8)		
35-44	42 (21)	83 (21.4)		
45-54	17 (8)	28 (7.2)		
55-64	3 (1)	11 (2.8)		
≥65	6 (3)	8 (2.1)		
Education			.704	—
Less than high school diploma or GED	4 (2)	6 (1.6)		
High school diploma or GED	15 (7)	22 (5.7)		
Some college	38 (19)	74 (19.1)		
Associate degree	16 (8)	34 (8.8)		
Bachelor degree	76 (30)	149 (38.5)		
Graduate degree	53 (26)	102 (26.4)		
Ethnicity			.437	—
Asian	6 (3)	15 (3.9)		
Black/African American	10 (5)	22 (5.7)		
Hispanic	19 (9)	40 (10.3)		
Multiracial	6 (3)	15 (3.9)		
Native American	3 (1)	4 (0.8)		
Pacific Islander	1 (0)	1 (0.3)		
White/Caucasian	152 (75)	279 (72.1)		
Other	5 (2)	11 (2.8)		
Income, \$			.235	—
<20 000	39 (19.3)	62 (16)		
20 000-34 999	24 (11.9)	54 (14)		
35 000-49 999	30 (14.9)	54 (16)		
50 000-74 999	49 (24.3)	94 (24.3)		
75 000-99 999	27 (13.4)	55 (14.2)		
≥100 000	33 (16.3)	68 (17.6)		
Relationship status			.141	—
Single	24 (11.9)	45 (11.6)		
Married	67 (33.2)	127 (32.8)		
In a relationship	98 (48.5)	193 (49.9)		
Divorced	13 (5.4)	6 (1.6)		
Other	0	16 (4.1)		
Religion			.889	—
Buddhist	0 (0)	2 (.50)		
Christian (Catholic, Protestant, any denomination)	25 (12.4)	53 (13.7)		
Hindu	1 (.50)	1 (.30)		
Jewish	11 (5.4)	15 (3.9)		
Muslim	0 (0)	2 (.50)		
Sikh	1 (.50)	1 (.30)		
I do not practice a religion	152 (75.2)	296 (76.5)		
Other	12 (5.9)	17 (4.4)		
Sexual orientation: LGBTQI+			.898	—
Yes	105 (52)	192 (49.6)		
No	93 (46)	188 (48.6)		
<b>Sexual behavior and relationship satisfaction</b>				
Masturbation frequency			.620	—
≥1/d	16 (7.9)	31 (8.0)		
2-3/wk	77 (38.1)	136 (35.1)		
4-5/wk	16 (7.9)	33 (8.5)		
Few times per month	62 (45.5)	117 (30.2)		
Once every few months	19 (9.4)	45 (11.6)		
I do not masturbate	12 (.50)	25 (6.5)		
Sexual issues besides orgasm difficulty			—	—
Yes	47 (23.3)	75 (19.4)		
No	155 (76.7)	312 (80.6)		

(Continued)

Table 1. Continued

Characteristic	Women, No. (%)		P value: cannabis effect on orgasm based on variable	
	With orgasm difficulty	With + without orgasm difficulty	With orgasm difficulty	With + without orgasm difficulty
Partnered sex frequency			.541	.617
≥1/d	11 (5.4)	23 (5.9)		
2-3/wk	83 (41.1)	162 (41.9)		
4-5/wk	21 (10.4)	52 (13.4)		
Few times per month	79 (39.1)	139 (35.9)		
Once every few months	8 (4.0)	11 (2.8)		
Relationship satisfaction			.606	—
Very satisfied	100 (49.6)	221 (57.1)		
Moderately satisfied	59 (29.2)	103 (26.6)		
About equally satisfied and dissatisfied	22 (10.9)	32 (8.3)		
Somewhat dissatisfied	15 (7.4)	19 (4.9)		
Very dissatisfied	3 (1.5)	4 (1.0)		
I am not in a partnered relationship	3 (1.5)	8 (2.1)		
Sexual relationship status			.629	—
In a sexual relationship with 1 person <10 y	121 (59.9)	226 (58.4)		
In a sexual relationship with 1 person >10 y	43 (21.3)	87 (22.5)		
Engaging in sex with >1 person	34 (16.8)	66 (17.1)		
Not in a sexual relationship with 1 person	4 (2.0)	8 (2.1)		
<b>Mental health, prescription drug use, sexual abuse history</b>				
Mental health diagnosis			.164	.004*
Yes	129 (63.9)	231 (59.7)		
No	73 (36.1)	156 (40.3)		
Mental health diagnosis type: ≥1 per person			—	—
ADHD	16 (7.9)	31 (8.0)		
Anxiety disorder	95 (47)	172 (44.4)		
Bipolar disorder	12 (5.9)	18 (4.7)		
Depressive disorder	86 (42.6)	147 (38.0)		
Obsessive compulsive disorder	5 (2.5)	8 (2.1)		
PTSD	40 (19.8)	64 (16.5)		
Other	13 (6.4)	24 (6.2)		
Prescription drug use			.232	.114
Yes	123 (60.9)	215 (55.6)		
No	79 (39.1)	172 (44.4)		
Sexual abuse history			.206	.003*
Yes	74 (36.6)	125 (32.3)		
No	128 (63.4)	262 (67.7)		
<b>Cannabis use behavior</b>				
Cannabis use frequency before sex			<.001*	<.001*
Never	0 (0)	0 (0)		
Rarely	20 (9.9)	36 (7.4)		
Some of the time	59 (29.2)	122 (31.5)		
About half the time	36 (17.8)	70 (18.1)		
Most of the time	64 (31.7)	116 (30.0)		
Every time	23 (11.4)	43 (11.1)		
Length of time using cannabis before sex, y			.797	—
<1	40 (19.8)	65 (16.8)		
1-3	71 (35.1)	144 (37.2)		
>3-5	30 (14.9)	55 (14.2)		
>5	60 (29.7)	122 (31.5)		
I do not use cannabis before partnered sex	1 (.50)	1 (.30)		
Primary intake method			.524	<.0001*
Smoking	100 (49.5)	183 (47.3)		
Vaping oil	33 (16.3)	66 (17.1)		
Vaporizing cannabis flower (weed)	12 (5.9)	26 (6.7)		
Edibles	48 (23.8)	95 (24.5)		
Tincture	5 (2.5)	9 (2.3)		
Topicals	1 (.50)	1 (.30)		
Other	3 (1.5)	7 (1.8)		

(Continued)

**Table 1.** Continued

Characteristic	Women, No. (%)		P value: cannabis effect on orgasm based on variable	
	With orgasm difficulty	With + without orgasm difficulty	With orgasm difficulty	With + without orgasm difficulty
Primary reason for use			.022*	<.001*
Relaxation	127 (62.9)	233 (60.2)		
Sleep	11 (5.4)	33 (8.4)		
Sex	21 (10.4)	37 (9.6)		
Other medical problem	9 (4.5)	19 (4.9)		
Prescription	20 (9.9)	38 (9.8)		
Pain	14 (6.9)	27 (7.0)		

Abbreviations: ADHD, attention-deficit/hyperactivity disorder; LGBTQI+, lesbian, gay, bisexual, transgender, queer/questioning, intersex, or other; PTSD, posttraumatic stress disorder. <sup>a</sup>Dashes indicate that the larger group was not analyzed when the P value was not significant for women with orgasm difficulty, except for mental health, prescription drug use, sexual abuse history, and primary intake method \*Statistically significant.

**Table 2.** Paired FSFI orgasm subscale questions with and without cannabis before sex.

Measure: how calculated	Cannabis used	No cannabis used	$\chi^2$ (P value) <sup>b</sup>	
Orgasm frequency: paired orgasm frequency response with and without cannabis before sex	Orgasm	Orgasm 121 (59.9)	No orgasm 58 (28.7)	38.5 (<.0001)*
	No orgasm	7 (3.5)	16 (7.0)	
Orgasm ease/difficulty: paired orgasm difficulty response with and without cannabis before sex	Difficult	Difficult 123 (60.9)	Not difficult 1 (0.5)	69.01 (<.0001)*
	Not difficult	70 (34.7)	8 (4.0)	
Orgasm satisfaction: paired orgasm satisfaction response with and without cannabis before sex	Satisfied	Satisfied 157 (77.7)	Dissatisfied 34 (16.8)	27.68 (<.0001)*
	Dissatisfied	3 (1.4)	8 (4.0)	

Abbreviation: FSFI, Female Sexual Function Index. <sup>a</sup>Data are presented as No. (%). <sup>b</sup>Results per McNemar test: women with female orgasmic dysfunction (n = 202; df = 1). \*Statistically significant.

the *with cannabis* score for each participant and totaled. A 1-sample t-test was performed.

For orgasm difficulty, 2 represented *extremely difficult or impossible* and 6 *not difficult*. Orgasm difficulty responses were grouped by scores 2 to 5 as *difficult* and 6 as *not difficult*. The orgasm difficulty score without cannabis was subtracted from the score with cannabis. One-factor ANOVA was performed.

For orgasm satisfaction, 2 represented *very satisfied*, 4 *about equally satisfied/dissatisfied*, and 6 *very dissatisfied*. Orgasm satisfaction responses were grouped by scores 2 and 3 representing *satisfied*, 4 *about equally satisfied/dissatisfied*, and 5 and 6 *dissatisfied*. The orgasm satisfaction score without cannabis was subtracted from the score with cannabis. One-factor ANOVA was performed.

Demographic data, sexual behavior, mental health, sexual abuse history, and cannabis use behavior were tested with 1-factor ANOVA. The exception was race, which was computed with a 1-sample t-test. A score from 2 to 6 was given to each participant's orgasm frequency response with and without cannabis before sex, with 2 representing *almost always or always* and 6 *almost never*. The *no cannabis* score was subtracted from the *with cannabis* score for each participant and computed per the variable.

## Results

### Orgasm subscale of the FSFI

Of women with FOD (n = 202), 28.7% (n = 58) experienced orgasm with cannabis and no orgasm without cannabis ( $\chi^2 = 38.5$ ,  $P < .0001$ , McNemar); 34.7% (n = 70) reported

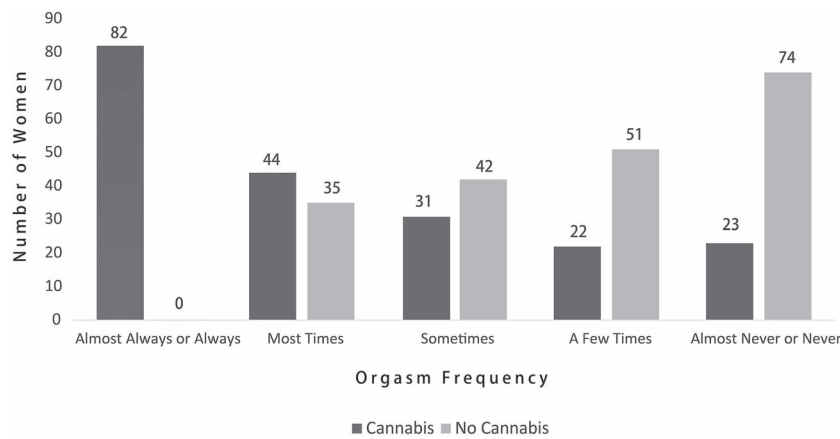
that it was not difficult to orgasm with cannabis and difficult to orgasm without cannabis ( $\chi^2 = 69.01$ ,  $P < .001$ , McNemar); and 16.8% (n = 34) indicated that they were satisfied with cannabis and dissatisfied without cannabis ( $\chi^2 = 27.68$ ,  $P < .0001$ , McNemar). Table 2 presents the data.

### Orgasm frequency

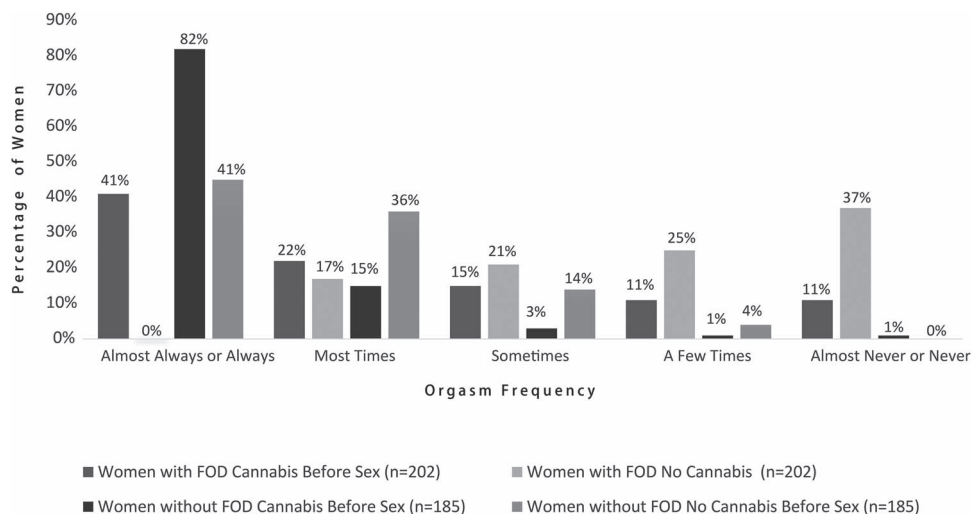
Orgasm frequency increased 39.8% for women with FOD (n = 202), with 88.8% (n = 179) experiencing orgasm almost always, most times, sometimes, or a few times when using cannabis as compared with 63.3% (n = 128) without cannabis. Women with FOD who almost never or never orgasm decreased 68.9%, with 36.6% (n = 74) almost never or never experiencing orgasm without cannabis as compared with 11.4% (n = 23) with cannabis, Mean difference  $-1.50$  with  $t(201) = 14.68$   $P < .0001$  (1-sample t-test). Figure 1 presents the data. Comparative data revealing differences in women's orgasm frequency with and without FOD and with and without cannabis are presented in Figure 2.

### Orgasm difficulty

Orgasm difficulty decreased 35.4%, with 61.4% of women with FOD (124/202) reporting that orgasm was slightly difficult, difficult, very difficult, or extremely difficult or impossible with cannabis as compared with 95.1% (n = 192) without cannabis. Women who indicated that it was extremely difficult or impossible decreased 67.4%, with 22.8% (n = 46) finding it extremely difficult or impossible with cannabis vs 7.4% (n = 15) without cannabis,  $F(1, 200) = 36.37$ ,  $P < .0001$  (1-factor ANOVA). Figure 3 presents the data.



**Figure 1.** Measures for orgasm frequency during partnered sex for women with orgasm difficulty were fielded from March 23 to November 18, 2022, of women aged at least 18 years who reported orgasm frequency within the last 30 days with and without cannabis use before partnered sex. Orgasm frequency responses after cannabis and no cannabis were given a score from 2 (almost always) to 6 (almost never) for each participant. The difference of each score with cannabis and without cannabis was computed. If there is no cannabis effect, the mean of the scores should be zero. A negative score indicates a negative cannabis effect. The hypothesis that the mean of the differences was zero was tested per the 1-sample *t*-test. The mean difference was  $-1.50$ ;  $t(201) = -14.68$ ,  $P < .0001$ .



**Figure 2.** Measures for orgasm frequency during partnered sex for women with and without orgasm difficulty were fielded from March 23 to November 18, 2022, of women aged at least 18 years who reported orgasm frequency within the last 30 days with and without cannabis use before partnered sex. Respondents were asked, "Over the past month, when you USED cannabis BEFORE partnered sex, how often did you reach orgasm (climax)?" and "Over the past month, when you DID NOT USE cannabis BEFORE partnered sex, how often did you reach orgasm (climax)?" Possible responses included *almost always or always*, *most times (more than 1/2 of the time)*, *sometimes (about 1/2 of the time)*, *a few times*, and *almost never or never*. Comparative data are presented.

### Orgasm satisfaction

Orgasm satisfaction increased 97.7%, with 86.1% of women with FOD (174/202) reporting that they were very satisfied, moderately satisfied, or about equally satisfied and dissatisfied with cannabis as compared with 43.6% ( $n = 88$ ) without cannabis. Women who reported that they were moderately or very dissatisfied decreased 75.4%, with 56.4% ( $n = 114$ ) being moderately or very dissatisfied without cannabis vs 20.8% ( $n = 28$ ) with cannabis,  $F(2, 199) = 61.88$ ,  $P < .0001$  (1-factor ANOVA). Figure 4 presents the data.

### Frequency of cannabis use and length of time using cannabis before sex

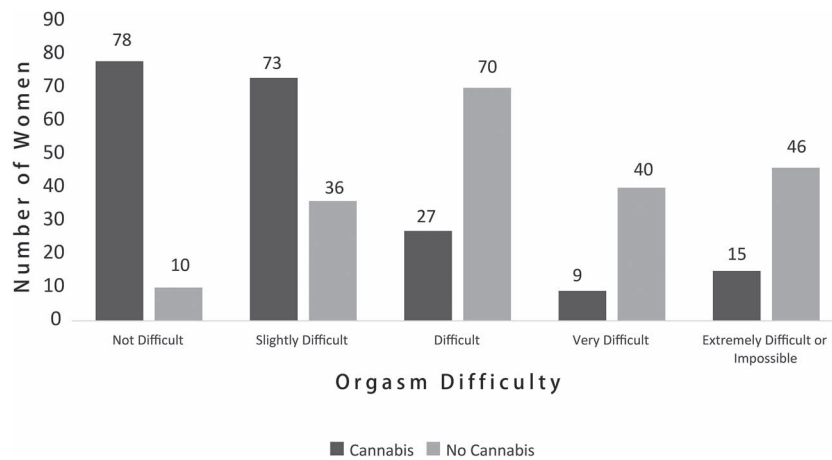
The frequency of cannabis use before sex increased orgasm frequency in women with FOD,  $F(4, 197) = 5.13$ ,  $P < .001$  (1-factor ANOVA). The largest group of women with FOD

used cannabis most of the time (31.7%, 64/202). Those who responded *almost always or always* orgasmed 47% of the time. Table 1 presents the data.

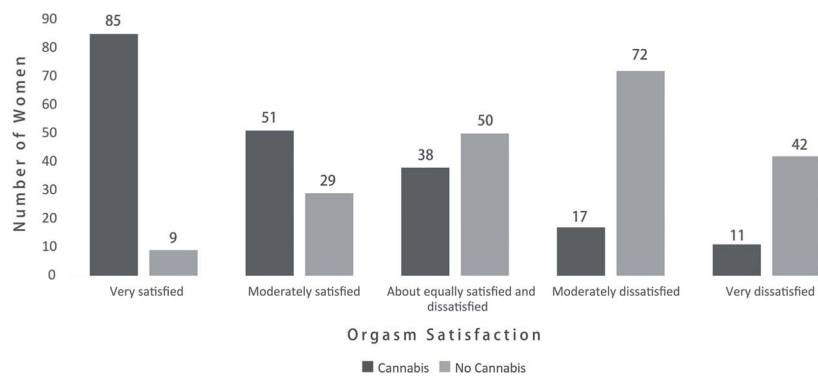
The duration of a woman's history of using cannabis before sex was not statistically significant for women with FOD,  $F(3, 197) = 0.34$ ,  $P = .797$  (1-factor ANOVA). However, this result is relevant because women reported improved orgasm experiences regardless of how many months or years before sex they had used cannabis. The largest group of women (35%, 71/202) used cannabis before sex for 1 to 3 years.

### Reasons for cannabis use and intake method

Cannabis reason for use was statistically significant in creating a more positive orgasm characterization for all respondents,  $F(5, 381) = 5.81$ ,  $P < .001$  (1-factor ANOVA) and particularly for women with FOD,  $F(5, 196) = 2.71$ ,  $P = .022$  (1-factor



**Figure 3.** Measures for orgasm difficulty during partnered sex for women with orgasm difficulty were fielded from March 24 to November 18, 2022, of women who reported orgasm difficulty with and without cannabis use before partnered sex. Orgasm difficulty responses were given a score from 2 to 6, with *slightly difficult*, *difficult*, *very difficult*, and *extremely difficult* given a score of 2 to 5 and grouped as *difficult* and *not difficult* given a score of 6. A 1-factor analysis of variance was done to test the hypothesis of no differences among the means between the 2 categories tested. The result was  $F(1, 200) = 36.37, P < .0001$ .



**Figure 4.** Orgasm satisfaction for women with orgasm difficulty with and without cannabis use before partnered sex. Measures for orgasm satisfaction during partnered sex for women with orgasm difficulty were fielded from March 24 to November 18, 2022, of women aged at least 18 years who reported orgasm satisfaction with and without cannabis use before partnered sex. Orgasm satisfaction responses were given a score from 2 to 6. Scores of 2 (very satisfied) and 3 (moderately satisfied) were combined into 1 category (satisfied; group 1); a score of 4 (about equally satisfied and dissatisfied) stayed the same (group 2); and scores of 5 (moderately dissatisfied) and 6 (very dissatisfied) were combined into 1 category (dissatisfied; group 3). The means are as follows: group 1,  $-2.0$  ( $n = 136, SD = 1.2$ ); group 2,  $0.5$  ( $n = 38, SD = 0.8$ ); group 3,  $0.1$  ( $n = 28, SD = 0.7$ ). A 1-factor analysis of variance was done to test the hypothesis of no differences among the means. The result was  $F(2, 199) = 61.88, P < .0001$ .

ANOVA). Survey participants selected from 5 categories when describing their orgasm experience: pain, relaxation, sleep, sex, and other medical problems, including the use of prescription medications. Of the women with FOD, 63% (127/202) reported using cannabis for relaxation.

Smoking was the foremost method of cannabis intake by all study participants (47.2%, 183/387). Among all women, this method of cannabis ingestion was significantly related to a more positive orgasm response,  $F(4, 382) = 7.58, P < .0001$  (1-factor ANOVA). However, the same could not be said for women with FOD,  $F(4, 197) = 0.80, P = .524$  (1-factor ANOVA).

### FOD and other sexual issues

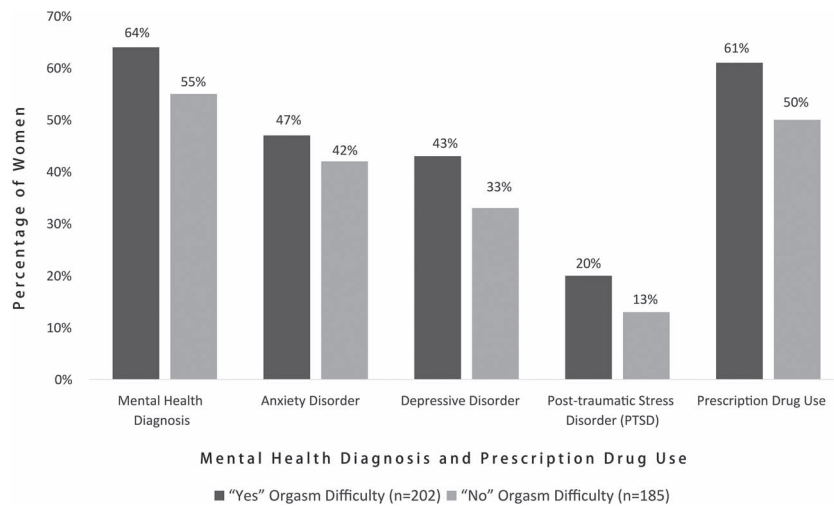
The majority of women who reported FOD ( $n = 202$ ) during partnered sex claimed the ability to orgasm in some situations but not others (71%,  $n = 144$ ), and 77% ( $n = 155$ ) had no other sexual difficulties. Of the 23% who identified other sexual difficulties, pain during sex was the number 1 sexual complaint. Of women without FOD ( $n = 185$ ), 85% ( $n = 157$ ) cited no other sexual challenges. Of the remaining 15%

( $n = 28$ ) who reported other sexual challenges, the majority (57%,  $n = 16$ ) experienced low sexual desire.

### Demographics, relationship status, and sexual behavior

When consumed before partnered sex, cannabis had no statistically significant relationship with age, race, income, education, religion, sexual orientation, sexual relationship status, relationship status, relationship satisfaction, sexual orientation, partnered sex frequency, or masturbation frequency. Among women with FOD ( $n = 202$ ), women aged 25 to 34 years (45%), in a relationship (not married; 48.5%, 98/202), holding a bachelor degree (38%, 76/202), and earning between \$50 000 and \$75 999 (24%, 49/202) constituted the largest group.

The majority of women with FOD noted their sexual orientation as LGBTQI+ (lesbian, gay, bisexual, transgender, queer/questioning, intersex, or other (52%,  $n = 105$ ) and their race as White (75%,  $n = 152$ ), expressed being very satisfied in their partnered relationship (49.5%,  $n = 100$ ) with 1 person



**Figure 5.** Measures for mental health diagnosis, diagnosis type, and prescription drug use for women who responded yes or no to orgasm difficulty were fielded from March 23 to November 18, 2022, of women aged at least 18 years who reported using cannabis before partnered sex. Respondents were asked, "Do you have a mental health diagnosis?" and if yes, respondents were asked the following question: "Please check your mental health diagnosis with the following options: anxiety disorder, depressive disorder, bipolar disorder, posttraumatic stress disorder, or other." Respondents were also asked, "Are you on any prescription medication?" (yes or no). Comparative raw data are presented.

<10 years (60%, n = 121), and indicated not practicing a religion (75%, n = 152).

### Mental health and prescription medication

Statistically significant differences were found among all women who had a mental health diagnosis (231/387) regarding a more positive orgasm response when using cannabis before sex,  $N = 387$ ,  $F(1, 385) = 8.60$ ,  $P = .004$  (1-factor ANOVA). Of the women with FOD (n = 202), 64% (n = 129) had a mental health diagnosis, and 61% (n = 123) took prescription medication. On average, women with FOD had 24% more mental health issues, 52.6% more cases of posttraumatic stress disorder (PTSD), 29% more depressive disorders, 13% more anxiety disorders, and 22% more prescription drug use than women without FOD. Figure 5 presents the data.

### Sexual abuse history

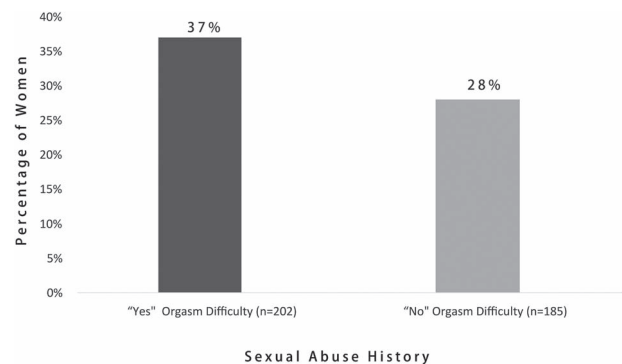
A statistically high percentage (32.3%, 125/387) of women who had a history of sexual abuse, with or without FOD, reported experiencing a more positive orgasm response to cannabis before sexual activity,  $F(1, 385) = 8.84$ ,  $P = .003$  (1-factor ANOVA). Among women with FOD (n = 202), those with a history of sexual abuse (38.6%, n = 74) represented 32.9% more sexual abuse history than women without FOD (27.6%, 51/185). Figure 6 presents the data.

### Discussion

The results corroborate 50 years of anecdotal and learned speculation about cannabis helping women with FOD. The research found that cannabis use increased orgasm frequency, eased orgasm difficulty, and improved orgasm satisfaction. At the same time, the results opened new areas of discussion.

### Improved orgasm response for women with a mental health diagnosis

Women in this study with 1 or more mental health diagnoses who use cannabis before partnered sex have a more positive



**Figure 6.** Measures for sexual abuse history for women who responded yes or no to orgasm difficulty were fielded from March 23 to November 18, 2022, of women aged at least 18 years who reported using cannabis before partnered sex. Respondents were asked, "Do you have a history of sexual abuse?" (yes or no). Comparative data are presented.

orgasm response regardless of whether they have FOD. These results are consistent with research finding that women with FOD experience high rates of mental health diagnoses,<sup>8,29–32</sup> prescription drug use,<sup>33–35</sup> or PTSD.<sup>36–39</sup> Women with anxiety disorders represented 44% (172/387) of women in this study. They were 3.5 times more likely to have FOD than nonanxious women.<sup>40</sup>

### Cannabis use resulted in more orgasms for sexual abuse survivors

Sexual abuse survivors' number 1 sexual complaint is orgasm difficulty,<sup>41</sup> coupled with high rates of PTSD.<sup>42,43</sup> This study revealed that 33% more women with sexual abuse histories reported FOD than women without FOD. THC in cannabis reduces activity in the hippocampus and amygdala,<sup>22,24</sup> the parts of the brain that store and react to traumatic memories.<sup>44,45</sup> This activity may play a role in extinguishing traumatic memories<sup>24</sup> and result in a more positive orgasm response.

## Cannabis and FOD treatment theories

Several theories explore why cannabis may be an effective treatment for FOD.<sup>46</sup> Dishabituation theory<sup>46</sup> proposes that cannabis lessens the routine of habits,<sup>47</sup> such as cognitive distraction, a known FOD cause,<sup>48–53</sup> and proposes that dishabituation may positively affect FOD.<sup>46</sup> Neuroplasticity theory proposes that some women learn to orgasm while using cannabis,<sup>46</sup> as seen in comments in this study and anecdotally.<sup>13,54</sup> Cannabis and endocannabinoids, the cannabinoids created by the human body, are increasingly recognized for their roles in neural development processes, including brain cell growth and neuroplasticity.<sup>55</sup>

Multimodal treatment theory proposes that women who use cannabis for any reason may lessen their FOD,<sup>46</sup> as noted by Kasman et al, who found that for each step up of cannabis use, female sexual dysfunction declined by 21%.<sup>5</sup> Amygdala reduction theory proposes that reduced amygdala activity can positively affect FOD.<sup>46</sup> Hypervigilance, anxiety, and PTSD are responses of the amygdala<sup>45</sup> and commonly impair sexual response.<sup>38,56</sup>

## Limitations

This study may not be generalizable to women who rarely use or do not use cannabis before sex, women who have never had an orgasm, or women who do not have female genitalia. The cultivar of cannabis was not a focus of this study, nor was the chemotype or amount of cannabis used. The partner's use or nonuse was also not evaluated in the study.

## Cannabis use before sex did not help all women

Cannabis use before sex did not help all women orgasm. Among survey respondents, 4% reported never having had an orgasm, even though they used cannabis before partnered sex.

## Conclusions

This study's findings support 50 years of speculation and research suggesting cannabis as a treatment for FOD. Key results of improved orgasm frequency, ease, and satisfaction for women reporting FOD during partnered sex show the potential of cannabis becoming a recognized treatment.

Cannabis use before partnered sex appears valuable to women who use it to treat FOD. Indeed, women with FOD experienced improvement during partnered sex regardless of the time frame of cannabis use.

Future research should focus investigations on the potential of cannabis as a treatment option for women who have been diagnosed with mental health diagnoses or have a sexual abuse history. Previous studies have indicated that women with these conditions experienced more positive orgasmic responses and greater satisfaction when using cannabis before sex. It is also essential to explore the use of cannabis as a treatment for primary anorgasmia, as well as for women who used to be able to orgasm but are now unable to do so. This study, with anecdotal reports and less focused studies, suggests that cannabis may improve orgasmic functioning in these women as well.<sup>13,54</sup> To further evaluate the effectiveness of cannabis in treating female sexual dysfunction and determine the appropriate dosage, it is recommended to conduct randomized controlled studies.

## Supplementary material

Supplementary material is available at *Sexual Medicine* online.

## Funding

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## Conflicts of interest

None declared.

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## Excerpts of results from five (5) 2024 scientific research studies related to cannabis and female orgasmic difficulty disorder (FOD):

- Most women with gynecological cancer present with sexual dysfunction, including orgasm dysfunction. Sexual function, including arousal, lubrication and orgasms, improved for the cannabis suppositories/mindful compassion group ( $p < .0001$ ) (Banbury et al., 2024).
- 55% of post-menopause women experience orgasmic dysfunction. Of the 451 survey respondents, 29.9% ( $N = 85$ ) of peri- or post-menopausal women stated that they used cannabis specifically to help them with orgasm. Overall, 70% stated “it helped them orgasm.” (Streicher, 2024).
- Half of the (anorgasmic) women explained that they sometimes use specific substances (eg, cannabis) to put their mind to rest and to reduce their mental ruminations (Adam & Grimm, 2023).
- Among women who experienced challenges in experiencing orgasm (52%,  $N = 202/387$ ), 72.8% ( $n = 147$ ,  $P < .001$ ) reported that cannabis use before partnered sex increased orgasm frequency, 67% stated that it improved orgasm satisfaction ( $n = 136$ ,  $P < .001$ ), and 71% indicated that cannabis use made orgasm easier ( $n = 143$ ,  $P < .001$ ) (Mulvehill & Tishler, 2024).
- Among the effects on women might be alleviation of conditions such as dyspareunia (painful intercourse) and enhancement of overall sexual satisfaction. We found that lower doses of cannabis to be linked to heightened sexual desire and enjoyment, whereas higher doses may lead to a decrease in sexual desire and performance (Lissitsa et al., 2024).

## Citations

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# How do women experience dyadic sexual activities at the attentional level? A qualitative study comparing anorgasmic and orgasmic women

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## Keywords

anorgasmia, female orgasm, cognitive distraction, attention

**ABSTRACT** – *This qualitative study aims to gain a deeper understanding of the attentional mechanisms in anorgasmic and orgasmic women during dyadic sexual activities. Seven women aged 21 to 40 ( $M = 31.57$ ,  $SD = 7.27$ ) completed several questionnaires and participated in a semi-structured interview. The thematic analysis revealed that anorgasmic women exhibit attentional biases that may contribute to the onset and persistence of orgasmic dysfunction: 1) Attention directed towards non-erotic stimuli in the sexual relationship, 2) Attention focused on mental rumination, and 3) Attention directed towards dysfunctional cognitions. In contrast, orgasmic women employ attentional strategies that facilitate orgasm: 1) Attention directed towards bodily sensations, 2) Attention focused on erotic fantasies, and 3) Redirecting attention towards erotic stimuli. In conclusion, the attention of anorgasmic women appears to be captured by attentional biases, while orgasmic women concentrate on the present moment (erotic and pleasurable stimuli). Therefore, it is crucial to assess attentional resources to enhance future interventions.*

## Introduction

Sexual health is fundamental to women's health and well-being (WHO, 2024). However, research indicates that 10 to 42% of women experience orgasmic disorders or anorgasmia (Graham, 2010), with 10% reporting never having achieved orgasm in their lifetimes (Laumann *et al.*, 1994). Orgasmic disorder stands as the second most prevalent female sexual difficulty observed in sexual clinics. Approximately 24% of

women have encountered either lifelong (primary anorgasmia) or temporary orgasm inhibition (secondary anorgasmia; Laumann *et al.* 1994). Defined as the "repeated or persistent absence or delay of orgasm after a phase of normal sexual arousal, with considerable variability in the type or intensity of stimulation required for orgasm in women" (APA, 2000, p. 632), orgasmic disorder necessitates a comprehensive diagnosis. This involves considering factors such as the woman's age (APA, 2000), her social, educational, and

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cultural background, relationship conflicts, as well as potential feelings of shame and guilt stemming from religious beliefs or family prohibitions (Meston *et al.* 2004). Long-term implications of this sexual disorder include the potential to significantly impact women's quality of life, leading to emotional distress and tension within the couple (IsHak *et al.*, 2010).

In accordance with the information processing model of sexual response proposed by Janssen and colleagues (2000), sexual stimuli are subject to evaluation along sexual (*e.g.*, pleasure, desire) or non-sexual (*e.g.*, absence of desire, fear) dimensions. The assessment of sexual stimuli involves two distinct components: 1) a rapid and unconscious genital response; followed by 2) a slower, awareness-dependent subjective sexual arousal (Laan *et al.*, 2005; Janssen *et al.*, 2000). Basson's (2002) model of the female sexual response emphasizes the significance of subjective sexual arousal in achieving orgasm. In the context of emotional intimacy, women are more likely to perceive stimuli in an erotic or sexual manner, thereby facilitating orgasm attainment. Recognizing the subjective experience of orgasm becomes crucial for comprehending the psychological mechanisms associated with orgasm, a viewpoint supported by various authors (*e.g.*, Graham, 2010; Lopès & Poudat, 2007; Mah & Binik, 2001; Meston *et al.* 2004; Porto, 2009; Rosen & Beck, 1988). Despite the physiological aspects of orgasm falling short of providing a comprehensive explanation, the psychological aspects, particularly cognitive factors, remain insufficiently investigated, underscoring the important role they play in a woman's sexual response.

The literature review by Tavares and colleagues (2020) underscores the pivotal role of cognitive factors, particularly in the context of sexual response and the achievement of orgasm. Women suffering from orgasm disorders activate significantly more cognitive schemas of incompetence and loneliness in situations of failure. Additionally, they manifest an increased prevalence of negative automatic thoughts, specifically those related to failure and disengagement, alongside the activation of negative beliefs linked to a poor body image (Nobre & Pinto-Gouveia, 2008a). Conversely, these individuals appear to have notably fewer erotic thoughts (Cuntim & Nobre, 2011; Nobre & Pinto-Gouveia, 2008b; Tavares *et al.*, 2017). Another study (De Sutter *et al.*, 2014) shed light on

the relationship, suggesting that anorgasmic women might not inherently possess fewer erotic thoughts but rather utilize them less frequently during intimate activities with their partners. Negative thoughts and ensuing emotions can monopolize cognitive resources for women, diverting their focus from the present moment. Consequently, this interference affects their ability to perceive physical sensations and diminishes their interoceptive awareness (Basson, 2002; Janssen *et al.*, 2000). Several studies (Cuntim & Nobre, 2011; Dove & Wiederman, 2000) consistently report a significant association between orgasm disorders and cognitive distraction.

The importance of 'focusing attention' during sexual encounters was initially recognized by Masters and Johnson (1970), who introduced the term "spectatoring" to underscore the lack of attention devoted to sexual activities. Similarly, Barlow (1986) contributed the concept of cognitive interference to describe individuals who become distracted during sexual activity, diverting their focus to non-erotic cues. His research indicated that sexually functional individuals tend to concentrate their attention on erotic and sexual stimuli, thereby enhancing sexual arousal. Attention plays a crucial preparatory role in information processing, equipping individuals to effectively engage in a task. It involves the mind's concentration on a specific task, selecting relevant stimuli while inhibiting other aspects of the experience. In doing so, attention acts as a filter, suppressing distractors from both the environment and the individual (Sieroff, 1998). However, during sexual activity, women generally exhibit a lower ability to inhibit non-sexual stimuli compared to men (Dewitte, 2016).

According to Gopher and Iani (2003), attention serves as the spotlight, orchestrating the entry of stimuli into consciousness through a combination of bottom-up and top-down processes. The former entails the involuntary direction of attention toward stimuli from the environment, such as a partner's expressions of love. In contrast, the top-down process is more deliberate, involving voluntary focus with a specific goal, for instance, watching an erotic film for arousal. Regarding sexuality, research by Spiering and Everardo (2007) demonstrates that attention can be directed either unconsciously or voluntarily to sexual stimuli, either in the environment or self-initiated.

This suggests the involvement of both bottom-up and top-down processes in the context of sexuality.

Contemporary sexual response models highlight the pivotal role of attentional processes in the progression of sexual arousal (Dewitte, 2016; Janssen *et al.*, 2000). However, there remains a gap in understanding the specific attentional mechanisms at play. In this study, we employed a qualitative design to address the query: “How do anorgasmic and orgasmic women differ in their experience of dyadic sexual activities at the attentional level?”

## Method

### Participants

Seven women aged 21 to 40 years ( $M=31.57$ ,  $SD=7.27$ ) completed several questionnaires and participated in a semi-structured interview. The inclusion criteria for selecting the sample comprised 1) being in a relationship, 2) residing in Belgium, and 3) being free of medication (*i.e.*, antidepressants, anxiolytics, or sleeping pills). The participants were allocated to either the “anorgasmic” clinical group ( $N = 4$ ) or the “orgasmic” control group ( $N = 3$ ). To control for the presence of an orgasm disorder, participants were defined as anorgasmic by the score of the ‘orgasm’ subscale and the Female Sexual Function Index total sexual function score of 26.55 (Wiegel *et al.*, 2005). In addition, FSFI scores and clinical interviews were compared with DSM-V criteria (APA, 2013) to verify the validity of the orgasmic disorder diagnosis.

### Recruitment and procedure

Participants were recruited online from February to March 2014, by means of a call for participants posted on various websites and social networks. The survey contained an informed consent form and multiple questionnaires. Eighty-three women provided their details to be later contacted for a semi-directive interview, and 44 of them met the selection criteria. The latter were contacted by email to schedule an interview at the Université Catholique de Louvain. Given a lack of response, we followed up with the proposal of conducting the interview through Skype or at their own home. Seven women agreed to be interviewed between May and June 2014. The study was approved

by the Ethics Committee of the Psychological Sciences Research Institute (Study number: 2012-48).

### Interviews

An individual semi-structured interview was conducted with each participant either by a master’s student in Family and Sexual Sciences or by a Psychological Sciences doctoral student. An interview guide was elaborated to explore the research question with each participant (see Appendices 1 and 2). This design is advantageous in that it is non-directive and enables interactions between the participant and the researcher. The interviews took place at an office within the Université catholique de Louvain or at the participant’s house. The duration of the interviews ranged from 45 minutes to 2 hours. Prior to each, the participants agreed to the recording of the interview using a voice recorder and to its transcription. The interview guide and all scripts are available upon request.

### Data analysis

The interviews were analyzed following the Grounded theory approach (Glaser & Strauss, 1967) to produce a theoretical explanation of the research question. The transcripts were read several times to identify the most frequently cited themes. Anorgasmic women’s testimonies were compared to that with no sexual difficulties, in order to better understand the differences between them at the attentional level.

### Measures

#### Female Sexual Function Index, FSFI

The Female Sexual Functioning Scale or FSFI (Rosen *et al.* 2000) is a measure of female sexual functioning, composed of six subscales: desire (2 items), arousal (4 items), lubrication (4 items), orgasm (3 items), sexual satisfaction (3 items), and sexual pain (3 items). The self-report questionnaire comprises 19 items answerable on a 6-point Likert scale items ranging from 0 (no sexual activity) to 5 (very high or very often), or from 1 (almost never or never) to 5 (almost always or always). To calculate the score for each subscale, the sum of the respective items are obtained and multiplied by the subscale’s factor. The total score refers to the sum of the scores of all six subscales. A total score

that lies below 26.55 indicates the presence of sexual dysfunction. The scale has a high internal validity of 0.86, a validity which was confirmed within our sample ( $\alpha = 0.92$ ). Chronbach's alphas of the subscales ranged from 0.71 to 0.99 for the orgasm subscale. Thus, the scale is a reliable measure for distinguishing clinical levels of sexual difficulties among women.

### Female Sexual Distress Scale – Revised, FSDDS-R

The Female Sexual Distress Scale (FSDDS-R; Derogatis *et al.* 2008) provides a quantitative, standardized measure of personal sexual distress in women. The questionnaire is composed of 13, 5-point Likert-scale items (0 = never, 1 = rarely, 2 = often, 3 = very often, 4 = always). A total score above 11 indicates sexual distress. The scale has high internal validity of .86, which was replicated in our sample ( $\alpha = 0.91$ ). This scale appears to be a reliable tool for differentiating between women with or without sexual distress. It was translated into French through a back-translation procedure. One researcher independently translated the scale into French, after which a second translated it back to English, which limited translation errors in the original version.

## Results

### Descriptive analyses

Our clinical sample consisted of seven sexually active women with a frequency of dyadic sexual activity ranging from six to more than 10 times per month. Four women aged 21 to 38 ( $M = 31$ ,  $SD = 7.43$ ) had a diagnosis of anorgasmic disorder, with three suffering from primary anorgasmia and one from secondary anorgasmia. The control group consisted of three women aged 23 to 40 ( $M = 32.33$ ,  $SD = 8.62$ ) with no sexual difficulties. All women were heterosexual, medication-free, in a relationship for at least six months, and with a high educational level (bachelor's or master's degree). As presented in *table 1*, samples across the two conditions did not significantly differ in terms of age, relationship duration, level of education, and frequency of sexual activity without the partner. However, anorgasmic women ( $M = 4.50$ ,  $SD = 0.57$ ) were significantly more sexually active with their partner than orgasmic women were ( $M = 3.33$ ,  $SD = 0.57$ ),  $t(5) = 2.646$ ,  $p < 0.05$ .

After checking for significant outliers, normality (*i.e.*, kurtosis and skewness statistics), and homogeneity of

**Table 1.** Differences in means between anorgasmic and orgasmic women.

Measures	Anorgasmic (N = 4)		Orgasmic (N = 3)			
	M	SD	M	SD	t	ddl
Age	31	7.43	32.33	8.62	-0.220	5
Education	4.25	0.50	5.00	0.000	-2.535	5
Relationship length	75.25	91.71	49.66	47.28	0.435	5
Frequency of sexual activity with the partner	4.50	0.57	3.33	0.57	2.646*	5
Frequency of sexual activity without the partner	2.25	2.06	1.33	1.52	0.643	5
Sexual functioning – Total FSFI	22.17	5.23	29.96	3.64	-2.187	5
Sexual desire – FSFI	4.65	0.75	4.20	1.58	0.507	5
Sexual arousal – FSFI	3.75	1.33	5.30	0.45	-1.896	5
Lubrication – FSFI	4.27	1.59	5.40	0.60	-1.140	5
Orgasm – FSFI	1.60	0.56	5.06	1.28	-4.914**	5
Sexual satisfaction – FSFI	3.50	1.10	5.20	0.40	-2.501	5
Pain – FSFI	4.40	1.17	4.80	1.74	-0.366	5
Sexual distress – Total FSDDS-R	41.50	2.38	20.33	6.11	6.474**	5

M = Mean. SD = Standard Deviation. FSFI = Female Sexual Function Index: higher FSFI scores reveal a better sexual functioning. FSDDS-R = Female Sexual Distress Scale – Revised: higher FSDDS scores indicate higher sexual distress.

\*\*\* $p < 0.001$ ; \*\* $p < 0.01$ ; \* $p < 0.05$

variances, we applied t-test measure using SPSS 22 to compare the two groups. With respect to the FSFI scale, the two groups were only significantly different on the orgasm subscale. Women in the clinical anorgasmic group ( $M = 1.60, SD = 0.56$ ) scored lower than those in the control group ( $M = 5.06, SD = 1.28$ ),  $t(5) = -4.914, p < 0.05$ . These results indicate a significant difference between the two in terms of orgasm attainment and confirm the absence of any other sexual dysfunctions. In addition, women in the clinical group ( $M = 41.50, SD = 2.38$ ) also scored higher on the total FSD-R compared to controls (Wiegel *et al.*, 2005;  $M = 20.33, SD = 6.11, t(5) = 6.473, p < 0.001$ ). This shows that women suffering from anorgasmia reported more sexual distress than orgasmic women did.

### How do anorgasmic women experience dyadic sexual activities at the attentional level?

The thematic analysis of all interviews highlighted three attentional biases that were frequently reported by anorgasmic women: (1) attention directed towards non-erotic stimuli of the sexual activity, 2) attention oriented towards mental ruminations, and 3) attention directed towards dysfunctional cognitions (table 2).

#### Attention directed towards non-erotic stimuli of the sexual activity

Throughout the interviews, women most frequently reported an attentional bias towards non-erotic stimuli. These originated directly from the woman herself (e.g., pain) or from the partner (e.g., inappropriate gestures or words)

First, all anorgasmic women in our study ( $N=4$ ) indicated being distracted by either the partner's (a) specific behaviors that did not correspond to their

sexual expectations (e.g., sexual stimulation, gestures or words), or (b) their lack eroticization (e.g., cleanliness or attitude). Several testimonies can illustrate this focus of attention:

"The slightest gesture that doesn't suit me reminds me, at that moment, to tell myself that no [you will not reach orgasm]." "All it takes is one sentence, I don't remember what it was he told me the last time. He told me something but I don't know what it was, but we stopped. Even though things were going very well."

Second, most anorgasmic women ( $N=3$ ) attested that their attention was often drawn to their own non-erotic bodily sensations, emotions, or thoughts.

"It's fragile because if there's a feeling that's a little less pleasant, it will take up all the space. That's it, in term of imagination, also." "If I start making noise when it wasn't time to make noise, it breaks it for me a little... I'm not into it so it disconnects me, actually."

#### Attention oriented towards mental ruminations

Anorgasmic women also tend to focus on their mental ruminations during dyadic activities. This is characterized by thinking, evaluating, commenting on what they are experiencing with their partner, keeping control on their feelings, or sometimes anticipating sexual relations. They explain that their attention is mobilized by a constant mind chatter, which they cannot put to rest (table 2): "I stay a little stuck in that way of thinking, during the sexual act and therefore I have the impression, at least for me, that I am part of precisely those who overthink." "I ask for that, to concentrate, but I don't know what to do, I don't know what to tell myself at the very moment, I don't see what I should tell myself. I say to myself don't think about it." "My mind works too much, I have the impression, compared to what is happening."

Table 2. Attentional biases most often experienced by anorgasmic women.

Themes	Categories	Number of participants
(1) Attention directed towards non-erotic stimuli of the sexual activity	From the partner	4 women
	From the self	3 women
(2) Attention oriented towards mental ruminations	Mind chattering, evaluation, anticipation...	4 women
	Avoidant coping strategies	2 women
(3) Attention directed towards dysfunctional cognitions	Cognitive patterns of incompetence	3 women
	False beliefs	2 women



## Attention directed towards dysfunctional cognitions

Finally, anorgasmic women have a greater tendency to focus their attention on dysfunctional cognitions, including activating cognitive patterns of incompetence in reaching orgasm, catastrophizing the problem itself, and maintaining false beliefs about sexuality (table 2). Indeed, most anorgasmic women (N=3) testify being distracted by these patterns of incompetence: “I think that concretely, this is what it is. I will again experience frustration, in a sense. (...) the fact that I can no longer reach orgasm. (...) But no, you won’t, and no, it’s not going to work.” “It somewhere in the back of my mind that it won’t come. (...) not to experience too much pleasure, to be conditioned to not have too many orgasms. As a result, my body may function this way, it stops automatically.” “I don’t think it’s going to get any better because it’s been a year...”

With respect to the false beliefs, half of the anorgasmic women (N=2) argue that orgasms must originate from vaginal penetration, a belief that is also endorsed by the partner: “I actually used to really see orgasms by penetration only.” “He is under the impression that to give me a true orgasm, it must be through penetration... with his genital.”

Additionally, some anorgasmic women will resort to avoidance-based strategies to deal with unpleasant sexual situations. For example, half of the women (N=2) explained that they sometimes use specific substances (e.g., cannabis) to put their mind to rest and to reduce their mental ruminations: “Sometimes we smoke and, uh, I shouldn’t say it but, honestly, sometimes it helps me a lot. Because I’m more relaxed and I let myself go, it really helps me.” “When I’ve smoked, I manage to let myself go a lot more, for example.”

## How do orgasmic women experience dyadic sexual activities at the attentional level?

The second objective of the current study is to gain further knowledge regarding the focus of attention during dyadic sexual activities, in women who usually reach orgasm. The analysis of the interviews highlight three attentional strategies that women apply: 1) attention oriented towards bodily sensations, 2) attention directed towards erotic fantasies, and 3) redirecting attention towards erotic and sexual stimuli (table 3).

### Attention oriented towards bodily sensations

Throughout the interviews, it became clear that the most frequently used attentional strategy employed was focusing the attention towards one’s bodily sensations. In fact, all orgasmic women (N=3) reported that they maintain their attention on various sensations, such as caresses, genital sensation or sexual desire, in order to facilitate orgasm attainment: “It’s the key, if I come back to myself, to my body, to the present moment, I am completely there, I will enjoy a great moment with my partner, I could experience orgasm.” “It’s looking for pleasant sensations, the position that bring more sensations than another or at a given moment, we can change and then be somewhere somewhat connected with one’s body, which means “hold on, I’d like this type of caresses.” “I really focus on the sensations of penetration, and it comes a hundred times faster, actually, I didn’t realize that by truly focusing on that penetration sensation, it would amplify to that extent. I think I was focusing far too much on the scene, on the activity like that. (...) really the frictions at the level of the body sensation, of the clitoris, or of the clicking between the thighs.”

**Table 3.** Attentional strategies most commonly employed by orgasmic women.

Themes	Categories	Number of women
(1) Attention oriented towards bodily sensations	Caresses, genital sensations	3 women
	Their sexual desire and that of the partner	1 woman
(2) Attention directed towards erotic fantasies	Imagery or experienced erotic scenarios or images	2 women
(3) Redirecting attention towards erotic and sexual stimuli	Use of erotic fantasies	2 women
	Bodily sensations	2 women

The partner's sexual desire also appears to be a helping factor for one of the participants, to more closely focus on her bodily sensations: "When I feel in him a desire as strong as mine, it triggers a very strong feeling of arousal that makes me enter this state of disconnection from my mind, and I am fully in my body."

#### Attention directed towards erotic fantasies

The second attentional strategy mentioned by the participants is the use of erotic fantasies during dyadic sexual activities. It is important to note that these erotic fantasies refer to any thoughts with an erotic and/or sexual connotation. In the current study, a few women ( $N=2$ ) focused their attention onto these, as follows (*table 3*): "I surely imagine a kind of fantasy where I see us making love (...). Sometimes, I also imagine someone watching but without the interest of voyeurism and, in the end, that's what makes me more and more aroused." "[Before reaching orgasm, she thinks about] exciting images. It might be fantasies, things that, in a sense, refuel the engine".

#### Redirecting attention towards erotic and sexual stimuli

The third strategy corresponds to the ability of refocusing one's attention towards erotic stimuli when feeling distracted. In fact, most women in the sample ( $N=2$ ) voluntarily redirect their attention towards erotic fantasies or bodily sensations during dyadic sexual intercourse when this is the case (*table 3*): "If I don't concentrate, it won't come. (...) when I'm thinking about something else and I really try to refocus, to find fantasies, that's it, that excite me and then I try to get back into it with him." "Well, sometimes it happens to not really have desire so we look for it a bit but (...) often it comes quickly, images that appear and, that's it, they continue and other images that arise."

## Discussion

The aim of the current exploratory study was to improve our understanding of how anorgasmic and orgasmic women differentially experience dyadic sexual activities at the attentional level. According to the results, anorgasmic women encounter several attentional biases, which inhibit them from being fully immersed in sexual intercourse. They show a

greater tendency to focus their attention on their partner's non-erotic stimuli during sexual activities, such as gestures and words. This mechanism is also observed when the stimuli emerge from the woman herself (e.g., pain and anticipations). Thus, it appears that anorgasmic women's attention is often oriented towards inappropriate or unpleasant aspects of sexual interactions.

Moreover, they also direct their attention towards their own mental ruminations. They often fail to put their "mind chatter" to rest. During sexual intercourse, their attention is focused on what they think they should – or want to – do, rather than on being fully immersed in their spontaneous bodily sensations. This can engender suffering, with half of the women in this study resorting to certain drugs to calm their thoughts.

Finally, the interviews also brought to light the fact that anorgasmic women may focus their attention on dysfunctional cognitions. As a result, they automatically activate cognitive patterns of inability to reach orgasm, themselves fueled by false beliefs regarding sexuality. Anorgasmic women appear to experience dyadic sexual activities with attentional abilities that are captured by non-erotic stimuli, from which it is complicated to disengage their attentional focus.

In contrast, orgasmic women experience dyadic sexual activities in an entirely different way. One can observe that the cognitive strategies they apply are directed at the erotic stimuli of these sexual encounters. All participants in the respective group had a greater tendency to focus their attention on bodily sensations such as their partner's caresses or their own genital sensations. They explain a state of complete connection with their body's sensations. Others also report focusing on their sexual desire or that of their partner, as such to facilitate sexual arousal. Additionally, not only do they voluntarily focus their attention on erotic fantasies or images, they are also able to redirect their attention to erotic stimuli (e.g., fantasies, bodily sensations) when the latter has been distracted by non-related information. Thus, it seems that the activation of attentional abilities is crucial for the attainment of orgasm.

These qualitative findings replicate previous research (Cuntim & Nobre, 2011; Dove & Wiederman, 2000) that has uncovered how women with sexual dysfunction and, more particularly, anorgasmia,

present more cognitive distractions compared to women with no particular sexual difficulty. Our study further replicates Nobre and Pinto-Gouveia (2008b)'s observations regarding the higher number of cognitive patterns of incompetence and automatic negative thoughts found among anorgasmic women. Several authors (Basson, 2002; Janssen *et al.*, 2000) stipulate that these types of thoughts, as well as the resulting emotions, will monopolize women's cognitive resources, diverting them from the present moment and impeding on their interoceptive awareness (i.e., their ability to perceive their own bodily sensations).

This concept of distraction is also explained by Barlow's (1986) interference model. The latter states that a sexually functional individual will direct their attention towards erotic stimuli, thereby increasing sexual arousal, while a more sexually dysfunctional person is more likely to orient their attention towards non-erotic stimuli (e.g., negative thoughts about oneself, others, or the world), which will hamper arousal as a consequence. The literature indicates that sexually functional women voluntarily direct their attention towards erotic stimuli, and that they must stay concentrate in an attempt to reach orgasm (Sholty *et al.* 1984). Similarly, they apply attentional strategies to increase and decrease their own sexual arousal (Beck & Baldwin, 1994). As explained by Sieroff (1998), attention inhibits non-relevant distractors that stem from the environment or from within the individual. However, it appears that anorgasmic women fail to do so.

A recent review of the literature by Milani and colleagues (2021) found that women with sexual dysfunction have greater difficulty in attentional processing of sexual stimuli. While increased attention to sexual stimuli may facilitate sexual arousal in all women, those with sexual dysfunction appear to have more difficulty processing salient aspects of such stimuli (e.g., genital areas), resulting in less arousal. In this respect, Velten and colleagues (2021) report that women with sexual dysfunctions tend to pay less attention to genital areas when watching videos of heterosexual couples having vaginal sex.

Our qualitative study complements the results of previous studies and provides a better understanding of attentional mechanisms and, more specifically, of orgasmic and anorgasmic women. In fact,

we hypothesize that the difficulties encountered in the attentional processing of sexual stimuli can be explained by attentional biases that prevent women from accessing their full attentional resources. Consequently, designing treatments that account for this difficulty could be a prime avenue for future research and practice. With this in mind, Moura and colleagues (2020) propose clinical approaches that encourage women to shift their attention from negative thoughts to erotic stimuli.

### Study limitations

However, our study has several limitations. First, the sample size is relatively small. Recruitment was difficult, as some people felt uncomfortable talking about the intimate subject of sexuality and, more specifically, orgasm. Additional interviews would increase the generalizability and validity of the current results. Second, as this study is rooted in a qualitative approach, the observation of attention-related mechanisms remains subjective and limited to the people interviewed. It would be interesting to conduct future studies on larger samples using quantitative approaches and objective measures of attention to increase the generalizability and validity of the current results. Nonetheless, the current study represents a first step towards a better understanding of how attentional biases may not only be present but may also have a direct impact on women's achievement of orgasm.

### Clinical implications

This study suggests some specific clinical avenues. As attentional biases may represent a factor responsible for and common to the maintenance of sexual disorders, it seems essential that therapists integrate not only the assessment of these biases, but also the implementation of direct interventions on them. We therefore recommend that attentional resources and biases be assessed at the time of diagnosis of female orgasmic disorders, something that is still not done enough in consultations, in order to propose appropriate sex therapeutic interventions. For example, a mindfulness-based sexotherapeutic intervention could be prescribed, as it would address the attentional biases responsible for the maintenance of orgasmic disorders. This technique is widely used in the treatment of

psychopathological disorders and, more recently, for female sexual dysfunctions (Adam *et al.* 2015; Brotto & Heiman, 2007; Brotto *et al.* 2008, 2012). Numerous studies have demonstrated that mindfulness significantly improves attentional capacity (Jha *et al.* 2007; Valentine & Sweet, 1999; Chambers & Allen, 2008) and reduces negative thoughts (Heeren & Philippot, 2010). Mindfulness comprises two main modules: attention orientation towards the experience and the self-regulation of attention (Bishop *et al.* 2004).

## Conclusion

Anorgasmic women present attentional biases that may be responsible for the onset and maintenance of orgasmic dysfunction. Orgasmic women, on the other hand, report connecting to the present moment (to themselves, to their partner). To conclude, we advocate for the evaluation of attentional resources and biases during the diagnosis of female orgasmic disorders to better prescribe appropriate sexotherapeutic techniques.

## Conflicts of interest

None of the authors has any conflict of interest to disclose.

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## Appendix 1

Interviewing guide for anorgasmic women. "How do you experience sexual activities with your partner at the attentional level?"

1. Opening question	Hello, did you easily find the faculty?
2. Introductory questions	“Research shows that anorgasmic women are not connected to erotic stimuli when they are with their partner. In addition, anorgasmic women seem to present less daily mindfulness skills, a lack that is further accentuated during sexual activities with their partner. We need your help to understand this process in greater detail.”
3. Transitioning questions	Do you currently have any difficulties in reaching orgasm? How do you experience sexual activities with your partner on an attentional level? How do you feel during them? Emotions, feelings? What are the thoughts that go through your mind during these sexual activities, and how do you manage them?
4. Key questions	Are you fully immersed in the sexual activity? Are you fully focused/centered on the sexual activity? What effect does this have on your pleasure and orgasm?
5. Concluding questions	We have discussed many things today, what prevents you most from reaching orgasm? Which elements should future treatment programs for orgasmic disorder include? Would you like to add any additional information?

## Appendix 2

Interviewing guide for orgasmic women. “How do you experience sexual activities with your partner at the attentional level?”

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1. Opening question	Hello, did you easily find the faculty?
2. Introductory questions	“Research shows that orgasmic women are more connected to erotic stimuli when they are with their partner. In addition, orgasmic women seem to present better daily mindfulness skills, a phenomenon that is further accentuated during sexual activities with their partner. We need your help to understand this process in greater detail.”
3. Transitioning questions	Do you currently have any difficulties in reaching orgasm? How do you experience sexual activities with your partner on an attentional level? How do you feel during them? Emotions, feelings? What are the thoughts that go through your mind during these sexual activities, and how do you manage them?
4. Key questions	Are you fully immersed in the sexual activity? Are you fully focused/centered on the sexual activity? What effect does this have on your pleasure and orgasm?
5. Concluding questions	We have discussed many things today, what prevents you most from reaching orgasm? Which elements should future treatment programs for orgasmic disorder include? Would you like to add any additional information?

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# Update on cannabis in human sexuality

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## Abstract

**Rationale** Sexuality is a central aspect of being human that encompasses many facets. Cannabis, a widely used psychoactive substance, has been associated with various effects on sexuality. The relationship between cannabis and sexuality is complex and multifaceted, involving physiological, psychological, and social factors.

**Objectives** This review aims to provide an overview of the current literature on the effects of cannabis on several sexual functions, including sexual desire, arousal, orgasm, and sexual satisfaction. It also discusses the potential mechanisms underlying these effects, as well as the impact of dose and frequency of use.

**Results** This review has revealed a complex relationship between cannabis dosage and its influence on sexuality. It appears that the frequency of cannabis use in humans has been associated with the frequency of sexual activities. Individuals who use cannabis more frequently tend to report higher levels of sexual activity. Moreover, there is a notable gender difference in how cannabis affects sexuality. In addition, we found lower doses of cannabis to be linked to heightened sexual desire and enjoyment, whereas higher doses may lead to a decrease in sexual desire and performance.

**Conclusions** Overall, the association between cannabis and sexuality is complex and warrants further research to better understand the psychological and neurological mechanisms that underlie the effect of cannabis on these sexuality functions and its implications for sexual health. To advance in this endeavor, a crucial step is establishing a precise measurement of dosage in human studies.

**Keywords** Cannabis · Sexuality · Dosage · Frequency · Animal studies

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## Cannabis

### General information

Cannabis *Sativa* L., commonly known as cannabis or marijuana, is a versatile plant that has a rich cultural heritage. Its historical significance in traditional medicinal systems like Ayurveda (Guy et al. 2004) and Chinese medicine (Mechoulam 1986) can be traced back at least 3000 years, highlighting its prolonged use through the ages. Throughout time, cannabis has served various purposes, encompassing medicine, spirituality, and recreation (Rubin 2011). Its therapeutic benefits have garnered widespread acclaim, making it a symbol of peace and love embraced by counterculture movements. Interestingly, the World Health Organization estimates that a staggering 21,000 plant species of cannabis worldwide are utilized for medicinal purposes (Pertwee 2014). Within cannabis, there exist over 400 different compounds, with more than 100 of them belonging to the class of cannabinoids (Ashton 2001; Hanuš et al. 2016). These



cannabinoids are responsible for the plant's behavioral and psychotropic effects. Among them, the primary contributor to these effects is  $\Delta^9$ -THC (THC). Additionally, other cannabinoids such as cannabidiol (CBD), cannabichromene (CBC), and cannabigerol (CBG) are present, which offer medicinal benefits without inducing psychoactive effects. Apart from cannabinoids, the cannabis plant also contains various non-cannabinoid constituents derived from different classes of natural products (ElSohly et al. 2017).

Both animal and human studies suggest that the two main constituents of cannabis, THC and CBD have the same molecular formula and weight ( $C_{21}H_{30}O_2$ ; molecular weight 314.5 g/mol) but have quite different acute effects (Martin-Santos et al. 2012; Hanuš et al. 2016). The captivating psychoactive properties of cannabis primarily arise from its most famous cannabinoid, THC, which is present in its flowers and produces a wide range of pharmacological effects in animals and humans (Adams and Martin 1996). On the other hand, CBD and its biological effects have been the subject of many studies suggesting potential therapeutic applications, including its anti-inflammatory actions in various preclinical models (Burstein 2015).

In the United States and Australia, approximately 10% of those who have ever used cannabis become daily users, with an additional 20–30% using the drug on a weekly basis (Hall et al. 1999). Compared to heterosexuals, sexual minorities are more likely to use cannabis and have cannabis use disorders (Dyar 2022). When consumed, cannabis induces euphoria, relaxation, perceptual alterations, time distortion, and enhances ordinary sensory experiences such as taste and hearing which is expressed in heightened enjoyment of food and music. In social settings, it can evoke contagious laughter and increased sociability (Hall and Solowij 1998). Moreover, cannabis can also lead to adverse reactions, including heightened anxiety, panic, paranoia, and psychosis, which are dose-related and more common in inexperienced users, individuals with anxiety disorders, and those who are psychologically vulnerable (Johns 2001).

## Effects on the brain

Cannabis affects the brain in many ways by interacting with specific endogenous cannabinoid receptors, such as CB1 and CB2. CB1 receptors are distributed primarily in brain and peripheral tissues (Onaivi et al. 2006). These two well-characterized cannabinoid receptors are differentially distributed within the brain, with high concentrations found in neocortical, limbic, sensory, and motor areas (Ashton 2001). Upon consumption, cannabis releases various cannabinoids, which are differentially distributed within the brain and interacting with those specific endogenous cannabinoid receptors that mediate the effects of cannabinoids and marijuana use (Devane et al. 1988; Onaivi et al. 2006). The distribution of

these receptors closely mirrors that of injected THC; they encompass various regions within the brain, including the cerebral cortex, limbic areas (such as the hippocampus and amygdala), and subcortical areas (Herkenham et al. 1990).

According to Pertwee (2008), THC acts as a partial agonist on both CB1 and CB2 receptors. The effects THC produces seem to be highly influenced by the levels of expression and signaling efficiency of cannabinoid receptors, as well as the continuous release of cannabinoids. In contrast, CBD exhibits potent antagonistic properties against CB1 and CB2 receptor agonists in cells or tissues where CB1 and CB2 receptors are present.

## Sexuality

In 1966, Masters and Johnson coined the term: sexual response cycle. The sexual response cycle includes phases of desire, excitement, plateau, orgasm, and resolution (Kaplan 1979; Masters and Johnson 1966). In this section we will introduce and discuss the stages of desire, excitement, and orgasm.

### Sexual arousal and desire

Human sexual arousal is a complex and multidimensional experience encompassing both physiological and psychological processes. It is initiated by the processing of external stimuli (e.g., visual, tactile) or internal stimuli (e.g., fantasy) (Geer et al. 1993) and consists of interconnected components, including physiological changes, emotional expression, and motivated behavior (Frijda 1986). In men, genital response associated with sexual arousal tends to be more strongly associated with subjective sexual arousal to sexual stimuli compared to women (Chivers et al. 2010).

Sexual desire, also known as libido, is a persistent sexual drive or interest that continues throughout the sexual experience until orgasm or satisfaction is achieved (Kaplan 1979). Cherkasskaya and Rosario (2019) found that sexual desire exists on a spectrum, ranging from absent or diminished to high desire. Without desire, individuals may not experience the excitement phase or subsequent stages of the sexual response cycle, as the mental state plays a significant role beyond physical desire and arousal (Basson 2008).

Both men and women experience physiological responses during the excitement phase of sexual cycle response, including myotonia (increased neuromuscular tension throughout the body) and vasocongestion (swelling of genital tissues due to increased blood flow). Vasocongestion can lead to lubrication in women and erections in men. However, it is important to note that vaginal lubrication alone is not an accurate indicator of arousal, as women can exhibit genital responses without experiencing desire (Chivers and Bailey

2005). The plateau phase follows the excitement phase and involves further increase in sexual arousal while sexual tension levels off yet does not reach the threshold required for orgasm. Orgasm, on the other hand, is the release of accumulated sexual tension, resulting in involuntary rhythmic contractions in genital region. However, it should be noted that orgasm is not solely localized to the pelvic region but is a whole-body response (Kolodny et al. 1979).

### Sexual satisfaction and orgasm

Sexual satisfaction is a multifaceted concept that encompasses both emotional and physical fulfillment (Basson 2001) and refers to an individual's subjective assessment of the positive and negative aspects of their sexual relationships (Lawrance and Byers 1995). It can be influenced by various factors, including the quality of the relationship, physical health, and overall well-being (Pascoal et al. 2018). Research has shown that higher sexual satisfaction is correlated with factors such as experiencing multiple and consistent orgasms and engaging in frequent sexual activity (Kontula 2009; Kontula and Miettinen 2016).

Orgasm, typically resulting from rhythmic stimulation of highly sensory receptor-rich body parts, is commonly associated with sexual satisfaction (Komisaruk and Whipple 2011). “Orgasm inequality” is a phenomenon of men having routine and consistent orgasms, while women do not (Mintz 2017). The existence of an orgasm inequality gap highlights the inconsistency in orgasm experiences, particularly among women. Nonetheless, research consistently indicates the importance of orgasm in overall sexual satisfaction (Kontula and Miettinen 2016; Pascoal et al. 2018). While orgasm is often considered a central aspect of sexual satisfaction (Barrientos and Páez 2006), there is ongoing discourse challenging the emphasis on orgasm as the sole measure of satisfaction. Critics argue that this outcome-driven model overlooks and devalues other diverse sexual experiences (Frith 2013; Holmberg and Blair 2009; Potts 2000).

### Sexual disorders

In DSM-5-TR sexual dysfunction is defined as “a clinically significant disturbance in a person’s ability to respond sexually or to experience sexual pleasure” (American Psychiatric Association 2022). Sexual disorders are an important aspect of sexual experiences. In this paper we focus on several dysfunctions which were researched in the context of their interaction with cannabis: vulvodynia, dyspareunia, female anorgasmia, and erectile dysfunction. Vulvodynia is described as persistent vulvar pain lasting longer than three months where there is no recognizable organic cause of the disease, and with several potential associated factors (Bornstein et al. 2016). It is often described as a burning pain provoked by

pressure to the vestibule, such as in vaginal penetration, gynecologic examinations, or tampon insertion (Bergeron et al. 2001). Dyspareunia refers to recurring or persistent pain experienced during sexual intercourse (American Psychiatric Association 2022). Female anorgasmia, another sexual disorder, involves marked delay, infrequency, or absence of orgasm and is recognized as the second most common sexual dysfunction in women (Adam et al. 2015). Erectile dysfunction is a prevalent male sexual disorder characterized by the difficulty in achieving or maintaining an erection sufficient for sexual intercourse (Shamloul and Bella 2011). These sexual dysfunctions can impact sexual satisfaction and overall sexual experiences, highlighting the complex interplay between desire, arousal, pain, and orgasm in individuals' sexual lives.

### General effects of cannabis on sexuality in humans

Cannabis, widely believed to enhance sexual desire, has been found to have a bidirectional effect on sexual functioning. On the one hand, cannabis use has been associated with positive outcomes, such as prolonged intercourse, improved orgasm quality, and increased sexual satisfaction in both men and women; conversely, cannabis use has been linked to negative effects, including erectile dysfunction, sterility, and reduced testosterone levels. Additionally, cannabis use has been correlated with decreased condom use and a higher risk of sexually transmitted diseases (Balon 2017; Bustamante et al. 2022; Scimeca et al. 2017).

Interestingly, over 70% of participants report increased desire and orgasm intensity. Cannabis use has been linked to an increase in masturbation frequency (Barbonetti et al. 2024), with individuals who engage in masturbation reporting heightened pleasure when using cannabis (Moser et al. 2023). Additionally, many individuals noted an improvement in their sense of taste and touch during sexual experiences while under the influence of cannabis (Moser et al. 2023). Furthermore, cannabis has been reported to be used for sex to increase sexual pleasure, lower inhibitions, reduce feelings of anxiety and shame, and foster intimacy and connection with sexual partners (Parent et al. 2021).

Cannabis affects sexual function differently in men and women. According to a study of women with difficulty achieving orgasm, cannabis use before partnered sex eased reaching orgasm, improved orgasm frequency and satisfaction with orgasm (Mulvehill and Tishler 2024). Research suggests that cannabis may benefit women by assisting with conditions like dyspareunia, vulvodynia, pelvic pain, and other urogenital painful conditions. Cannabis may also improve symptoms of painful bladder urgency and enhance orgasms and overall sexual

satisfaction. Conversely, in men studies predominantly show that cannabis increases the risk of erectile dysfunction (Lyzwinski 2023).

Nevertheless, due to ethical constraints, no recent studies have utilized objective measurements to explore cannabis' impact on human sexuality, prompting us to investigate objective studies using non-human animals.

## Effects of cannabis on sexuality in non-human animal studies

Research concerning the effects of cannabis on male animals primarily centers on penile erection. Studies indicate that cannabis exerts a positive influence on penile erections in non-human subjects through two distinct mechanisms:

1. Studies by Melis and colleagues have demonstrated that erectile function is modulated by a specific group of oxytocinergic neurons in the paraventricular nucleus of the hypothalamus (PVN) of male mice, which contain CB1 receptors. Inhibiting these receptors has been shown to induce erections (Argiolas and Melis 2005; Castelli et al. 2007; Melis et al. 2004). This mechanism is believed to involve increased glutamatergic signaling, leading to enhanced nitric oxide production by oxytocinergic neurons, resulting in the release of oxytocin that facilitates penile erection (Castelli et al. 2007; Melis et al. 2006).
2. Cannabinoids may also impact penile erection through the smooth muscle in the corpus cavernosum, which is essential for initiating and sustaining erections. Studies have revealed the presence of CB1 receptors in the corpus cavernosum of rats, as well as CB1 and CB2 receptors in the corpus cavernosum of rhesus monkeys and humans (Gratzke et al. 2010; Melis et al. 2006).

Compared to males, the effects of cannabis on sexual behavior in female animals have been less studied and understood. This is attributed to factors such as the cyclic nature of the reproductive cycle, greater behavioral variability, complex hormonal interactions, and the influence of social and environmental factors.

In general, in non-humans the challenges of studies of this type are different – aspects of sexuality are harder to measure directly, and so only aspects that are simple to measure have been studied.

Despite these challenges, animal models provide valuable insights into cannabis' potential objective effects on sexuality.

## Effects of dose and frequency

After an extensive examination of the existing literature, it becomes evident that two key factors, frequency, and dose, have emerged as the focal points in understanding the impact of cannabis on human sexuality.

### Frequency

The frequency of cannabis use plays a crucial role in understanding its effects on sexuality. Studies examining the relationship between cannabis usage frequency and sexual functioning have reported both varying and similar effects across genders.

Several studies have examined the effects of cannabis usage on sexual activities and experiences across genders. For instance, Sun and Eisenberg (2017) conducted a study utilizing data from the National Survey of Family Growth, which involved more than 30,000 participants. The study findings revealed a significant association between the frequency of cannabis use and the frequency of engaging in sexual intercourse. In a study by Halikas et al. (1982), 100 regular cannabis users were interviewed and divided into two groups: frequent users (more than 5 times a week) and less frequent users. Interestingly, no significant difference was observed between the two groups in terms of enhanced sensory experiences, such as touch, smell, or taste, during sexual activity. However, the study did reveal that only frequent users intentionally sought to use cannabis to enhance their sexual experiences. This finding was consistent with Dawley et al.'s (1979) study, which indicated that only the more frequent cannabis users perceived cannabis as an aphrodisiac. Additionally, a report by Nahas and Greenwood (1974) from the Commission on Marijuana suggested that frequent cannabis use was associated with a greater increase in sexual pleasure compared to both non-daily and rare use. Conversely, Wiebe and Just (2019) discovered that excessive cannabis use interfered with sexual pleasure.

Exploring the impact of cannabis on female sexual function, a study conducted by Kasman et al. (2020), divided female customers of a cannabis dispensary into four categories based on their frequency of cannabis usage. They were surveyed using the Female Sexual Function Index (FSFI) questionnaire developed by Rosen et al. (2000), which assesses female sexual function over a four-week period across six individual domains with defined cutoff scores for sexual dysfunction. The study revealed a significant difference in total FSFI scores between the highest and lowest frequency categories, favoring higher usage. Increasing cannabis usage frequency by an additional day

was associated with higher total FSFI scores, as well as improvements in desire, arousal, orgasm, and satisfaction domains. Furthermore, as the frequency category increased, the likelihood of reporting sexual dysfunction declined. In another study by Lynn et al. (2019) utilizing the FSFI, it was discovered that frequent users had twice the odds of reporting satisfactory orgasms compared to those with infrequent use. A similar observation by Mulvehill and Tishler (2024) revealed that among women experiencing difficulties achieving orgasm, the frequency of cannabis use before partnered sex correlated positively with orgasm frequency. Additionally in a separate survey study by Smith et al. (2010), there was no observed association between frequency of cannabis use and sexual difficulties in women, such as reaching orgasm, dyspareunia, vaginal dryness, or lack of sexual pleasure.

Regarding male sexual function, it was demonstrated that daily cannabis use was associated with difficulties in achieving orgasm, including both delayed and premature ejaculation (Smith et al. 2010). Additionally, the study found no significant association between the frequency of cannabis use and trouble maintaining an erection. In a study conducted by Bhambhani et al. (2020), the International Index of Erectile Function (IIEF) instrument (Rosen et al. 1997) was utilized to examine the impact of cannabis usage on male sexual function. The study involved 325 men who were categorized into four frequency categories based on their cannabis use. The findings of the study revealed that men who used cannabis more frequently had higher overall IIEF scores. Furthermore, they performed better in four out of the five functional domains of the IIEF, namely erectile, orgasm, intercourse satisfaction, and overall satisfaction. However,

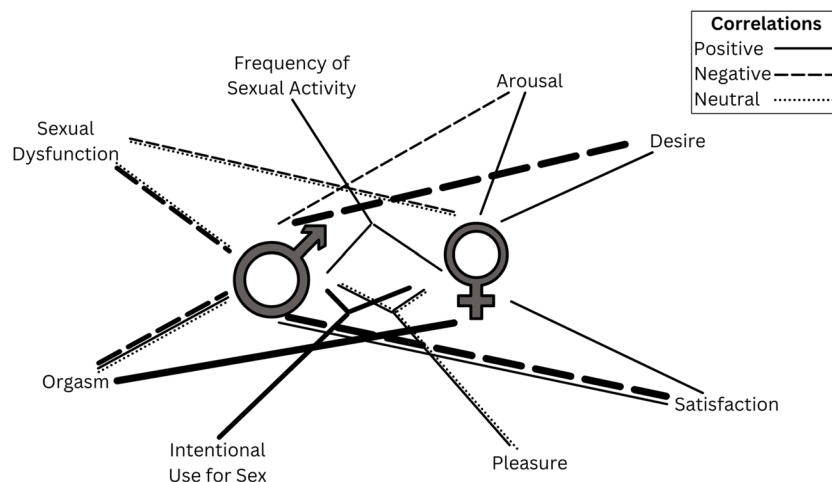
no significant association was found between cannabis usage frequency and the sexual desire domain. However, a smaller study found no significant association between the frequency of cannabis use and IIEF scores (Kumsar et al. 2016). Moreover, the same instrument employed in a study among 30 men with cannabis use disorder revealed a negative correlation between frequency of use and all domains of the IIEF (Asal et al. 2024).

In conclusion, studies investigating the impact of cannabis use frequency on human sexuality have yielded diverse and occasionally conflicting findings. Therefore, additional research is necessary, with a focus on standardization of frequency measurement and controlling for more covariates. This will help provide a more comprehensive understanding of the complex interplay between cannabis use frequency and sexuality (Fig. 1).

## Dosage

The dosage of cannabis consumed significantly affects its impact on sexuality, as varying levels of THC and CBD can influence sexual desire, arousal, and satisfaction (Palamar et al. 2018). However, researching the effects of dosage presents challenges due to the difficulty of accurately determining the exact dosage consumed by the average user, as there is no standard cannabis dose.

Despite the challenges surrounding the exploration of cannabis dosage and its impact on sexuality, a few studies have attempted to shed light on this relationship. For instance, in an earlier study conducted by Koff (1974), participants were asked to roll cannabis cigarettes, so that the researchers could estimate the average amount of cannabis



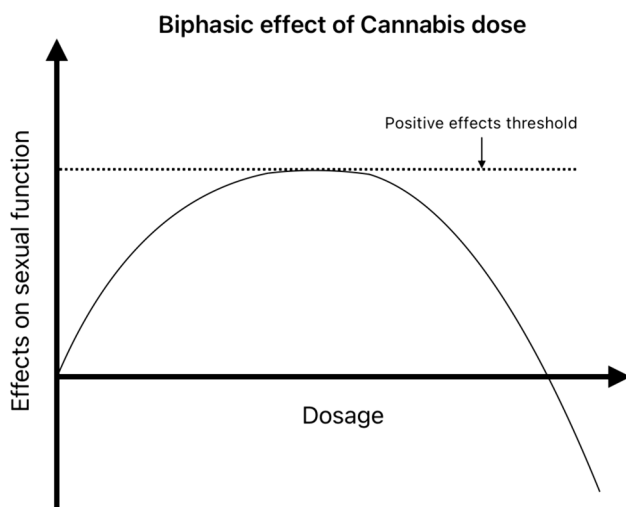
**Fig. 1** Visual representation of the influence of cannabis use frequency on various aspects of human sexuality, split by gender. The figure illustrates the way heightened frequency is associated with distinct facets of sexuality. Within the visualization, a solid line signifies a study that established a positive correlation with the given aspect,

while a dashed line indicates a negative correlation. Additionally, a dotted line portrays a study that detected no discernible effect. Notably, the width of each line corresponds to the number of studies validating the particular finding

in a cigarette. The findings revealed that both men and women who smoked between one and two cannabis cigarettes, with a THC content of 1%, reported an increase in sexual desire and enjoyment. However, beyond that dosage, the positive effects were no longer noticeable. Similarly, it was demonstrated that lower doses of cannabis increased sexual pleasure, while higher doses resulted in a reduction in sexual desire and performance among Indian men (Chopra and Jandu 1976). This association was further substantiated (Abel 1981) emphasizing the correlation between low doses of cannabis and enhanced sexual activity and very high doses were linked to difficulties in sexual performance (Buffum 1982).

In a review of recent studies, Kipping and Lynn (2022) found that moderate doses of cannabis improved female sexual function in domains such as orgasm, libido, and arousal. However, they also noted that high doses of cannabis may have negative effects on female sexual function.

These studies collectively highlight the complex inverted U relationship between cannabis dosage and its impact on sexuality, with lower to medium doses generally showing positive effects and higher doses potentially leading to diminished sexual experiences (Fig. 2).



**Fig. 2** Proposed illustration depicting the biphasic impact of cannabis dosage on human sexual function. This visual representation offers insight into the potential biphasic influence of Cannabis dosage on human sexual function. This conceptual figure is formulated based on our exploration of numerous studies indicating a biphasic trend in Cannabis dosage effects (Chopra and Jandu 1976; Kipping and Lynn 2022). At lower doses, Cannabis appears to exhibit favorable effects on human sexual function (Koff 1974; Abel 1981). These positive effects demonstrate an apparent upper limit, as denoted by the horizontal dotted line. Beyond a specific dosage threshold, the favorable impacts plateau (Koff 1974). Conversely, as dosage increases further, the constructive effects begin to wane, potentially transitioning into adverse effects. This transition is suggestive of a shift from positive to negative influences on human sexual function

## Discussion

The use of cannabis is prevalent today, with approximately 10% of individuals who have ever used cannabis becoming daily users, and an additional 20–30% using the drug on a weekly basis (Hall et al. 1999). In addition, cannabis use among adults and its availability (as a result of spreading legalization) are on the rise (Hasin and Walsh 2021; Rotermann 2020). Due to these facts, as well as reports of adverse effects of cannabis on humans (Arnold 2021; Hall and Solowij 1998), we decided to investigate how cannabis affects human sexuality.

Our initial investigation led us to question claims made by heavy cannabis users that cannabis acts as an aphrodisiac (Halikas et al. 1982; Koff 1974; Touw 1981), as the users may be biased.

Reports suggest that cannabis has the potential to enhance sexual pleasure, reduce inhibitions, alleviate anxiety and shame, and promote intimacy and connection with sexual partners (Parent et al. 2021). Furthermore, it has been associated with increased pleasure during masturbation and enhanced sensory experiences during sexual encounters (Moser et al. 2023). These observations indicate that cannabis may have notable effects on sexual experiences.

It is important to recognize that sexual satisfaction and the sexual response cycle are complex phenomena influenced by various factors, including the quality of the relationship, physical health, and overall well-being (Pascoal et al. 2018). Cannabis affects individuals in an integrative manner, impacting both physical and emotional aspects, which can potentially influence sexual experiences.

Sexual experiences as well as the effects of cannabis vary between men and women (Matheson et al. 2020; Sholler et al. 2021), those are congruent with studies finding the effects of cannabis on sexual function to differ between women and men. Among the effects on women might being alleviation of conditions such as dyspareunia (painful intercourse) and enhancement of overall sexual satisfaction. Moreover, low doses of cannabinoids, including THC and tetrahydrocannabinol, which possess sedative and hypnotic properties (Adams and Martin 1996), could potentially alleviate anxiety associated with sexual activities or interpersonal interactions, consequently disinhibiting sexual desire and arousal, particularly in certain women. The results of studies on men are conflicting (Shamloul and Bella 2011)—some suggest that cannabis causes erection dysfunction, premature ejaculation, and postponed ejaculation (Pizzol et al. 2019; Smith et al. 2010), while others claim the opposite (Bhambhani et al. 2020). Throughout our study, we found the dosage and frequency of cannabis use to be modulating factors in the

effects of cannabis on sexual experiences. However, the many conflicting results of different studies raise questions on the validity of the findings.

Most of the studies examined utilized subjective measurements for both sexuality and cannabis use, employing a wide range of questionnaires, contributing to inconsistencies. Thus, our aim was to identify studies employing objective measures. However, ethical constraints primarily confine objective studies to animal models, presenting a limitation as many aspects of sexuality are inherently subjective. Consequently, measurements often rely on observable factors like erections and coupling behavior.

Several factors contribute to the inconsistent findings. Foremost is the variability in ingested dose measurement, as the effects of cannabis derive from the concentration and interaction of its active components, which vary among strains (Ashton 2001; Naim-Feil et al. 2023; Hanuš et al. 2016). Moreover, cannabis consumption methods (e.g., smoking, vaporizing, orally) and preparation techniques influence consumer effects (Farokhnia et al. 2020; Julien 1995). Lastly, within each method of consumption, the concentration of active components differs with the method of preparation. To conclude, cannabis active component variation differs between strains, ingestion method and preparation. Most times, users do not measure the exact concentration of active components in the cannabis they consume, rendering questionnaires that do try to measure dosage unreliable.

Another factor is the notable change in active component concentrations over time. Studies indicate a significant increase in THC concentration and THC/CBD ratio from the 1990s to the mid-2010s, (Dujourdy and Besacier 2017; ElSohly et al. 2016; Freeman et al. 2018) making inferences from older studies undependable.

Furthermore, variability in subjective study nature, including differences in question wording regarding libido, orgasm, pleasure, and pain, as well as diverse assessment methods (e.g., questionnaires, interviews) and focus on specific marijuana users or the general population, contributes to literature inconsistencies.

These limitations, compounded by the absence of double-blind, randomized, placebo-controlled trials involving humans, impede the availability of conclusive evidence.

To mitigate these limitations, we suggest the following measures: Firstly, for questionnaire-based studies aiming to accurately assess dosage, future research should incorporate inquiries about consumption methods with easily measurable active component content. Cannabis edibles serve as a prime example, as legally purchased edibles typically provide such information. Moreover, prioritizing the measurement of dosage is crucial, even if it means excluding participants who cannot provide accurate information, as dosage is fundamental for assessing effects.

Additionally, standardizing measurements of sexuality and cannabis usage across questionnaire studies would enhance comparability. Finally, to address the absence of objective human studies and the subjective nature of sexual experience, integrating findings from objective animal studies with those from subjective human studies would help construct a comprehensive understanding of the effects of cannabis on human sexuality.

Overall, the effects of cannabis on human sexuality remain largely elusive and poorly understood. Despite efforts to investigate this complex relationship, our understanding is hindered by several factors, including methodological limitations and challenges in accurately measuring dosage. Future research ought to address these limitations and employ rigorous methodologies to provide more definitive insights into how cannabis influences human sexuality.

## Conclusion

In conclusion, this review paper has examined the extensive body of research exploring the effect of cannabis on sexuality. Throughout the analysis, it has become evident that cannabis exerts a multifaceted influence on various aspects of human sexuality, encompassing both positive and negative outcomes. Animal studies have provided valuable insights into the potential effects of cannabis on sexual behavior in both males and females, but further research, including human clinical trials, is essential to better understand the implications of cannabis use on sexual health and behavior in humans. Moreover, the dose and frequency of cannabis use have emerged as crucial factors in studying its effects on sexuality. Studies investigating the impact of cannabis use frequency on human sexuality have yielded diverse and occasionally conflicting findings, necessitating additional research with a focus on controlling for more covariates. Additionally, the relationship between cannabis dosage and its impact on sexuality appears to be complex and biphasic, with lower doses generally showing positive effects and higher doses potentially leading to diminished sexual experiences. However, these findings are cast into doubt due to the unreliability of dosage measurement in most studies.

Overall, numerous obstacles hinder the study of cannabis effects on human sexuality, and our knowledge is still very limited. Yet a deeper understanding can aid in mitigating harm and potentially enhancing human experiences.

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## Declarations

**Conflict of interests** None.

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June 20, 2024

U.S. States Medical Marijuana programs

Re: *Female Orgasmic Difficulty/Disorder* to be considered as a condition for treatment with medical cannabis

To Whom It May Concern:

I am the President of the International Institute of Clinical Sexology, where Dr. Suzanne Mulvehill completed her doctoral work and earned her PhD in Clinical Sexology. Her doctoral dissertation is titled:

**Cannabis for the Management of Female Orgasm Difficulty/Disorder: An Observational Study.**

This research supports the use of medical marijuana to treat or alleviate the condition of Female Orgasmic Difficulty Disorder.

As a sex therapist with a PhD in Human Sexuality, I can confidently state that conventional medical therapies are insufficient to treat this disorder.

Please do not hesitate to contact me for any further information.

Sincerely,

A handwritten signature in blue ink that reads 'Carol L. Clark'.

Carol L. Clark, PhD, LMHC, CST  
President, IICS

IICS is licensed under the Florida Department of Education by the Commission for Independent Education (CIE) and is authorized to grant a  
Doctor of Philosophy in Clinical Sexology degree. #5475

Director Dr. Carol Clark  
Counselor@DrCarolClark.com

Administrator Niki Koenig  
IICSPhD@gmail.com



February 29th, 2024

[norelyn@sexcoachu.com](mailto:norelyn@sexcoachu.com)

Re: Female Orgasmic Difficulty/Disorder to be considered as a condition for treatment with medical cannabis

To Whom It May Concern,

As a certified sex coach with a PhD in Human Sexuality and certified cannabis health coach, I am writing to ask that you approve Female Orgasm Disorder as a condition for prescribing cannabis.

My professional experience supports the use of cannabis as an extremely effective treatment for orgasm disorders. In addition, I have found that conventional treatments and therapies are not sufficient to treat this disorder.

Thank you for your consideration. Please do not hesitate to contact me for any further information.

Sincerely,

A handwritten signature in black ink, appearing to read "Norelyn Parker", with a long horizontal flourish extending to the right.

Norelyn Parker, PhD, CSC  
General Manager, Sex Coach U

# Dr. Nan Wise

Licensed Psychotherapist, Certified Sex Therapist, Certified Relationship Specialist

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June 19, 2024

Professional Recommendations for Medical Marijuana Treatment  
Female Orgasmic Difficulty/Disorder (FOD)

To Whom It May Concern,

As a certified sex therapist, sex neuroscience researcher, and author of *Why Good Sex Matters: Understanding the Neuroscience of Pleasure for a Smarter, Happier, and More Purpose-Filled Life* I am writing to ask that you approve Female Orgasm Disorder as a condition for prescribing cannabis.

My professional experience supports the use of cannabis as a very effective treatment for orgasm disorders.

I appreciate your consideration.

Nan Wise, Ph.D

Licensed Psychotherapist  
Certified Sex Therapist, AASECT  
Certified Relationship Specialist, The American Psychotherapy Association  
Behavioral Neuroscience Researcher, Psychology, Rutgers-Newark  
Fellow, The American Psychotherapy Association  
Fellow, The National Board for Clinical Hypnotherapists  
Board Certified Diplomate, The American Board of Examiners in Social Work

Author of *Why Good Sex Matters: Understanding The Neuroscience of Pleasure for a Smarter, Happier and More Purpose-Filled life*

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