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Article

Evaluating Sexual Health in Women with Multiple Sclerosis: A Study on the Interplay of Disability and Quality of Life

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Abstract: In the context of evolving perceptions of sexuality, particularly within the realm of health and disability, this study investigates the impact of multiple sclerosis (MS) on female sexual function and quality of life. A quantitative study involving 130 female MS patients aged 35 to 50 was conducted, employing measures such as The Female Sexual Function Index (FSFI), The Multiple Sclerosis Intimacy and Sexuality Questionnaire-19 (MSISQ-19), and The Fatigue Severity Scale (FSS). Results indicate a significant association between greater sexual dysfunction and poorer quality of sex life, alongside the correlation of increased fatigue with diminished sexual satisfaction. Factors such as education level, time of diagnosis, and treatment regimen also influenced outcomes. Findings underscore the importance of supportive interventions, including counseling, to enhance the quality of sex life for women with disabilities, particularly those with MS.

Keywords: sexual dysfunction; multiple sclerosis; quality of sex life; female sexual function; disability; fatigue; supportive care interventions; counseling

1. Introduction

Sexuality's role as a fundamental aspect of human existence underscores its complex interplay with various individual and societal factors [1]. When examining the impact of these factors on women with disabilities, it is evident that biological and psychological components are profoundly intertwined. Biologically, women with disabilities may face specific physical challenges that can directly affect their sexual function, such as hormonal disturbances, neurological disorders, or physical limitations that alter sexual response and activity. Psychologically, the perception of one's sexual identity and self-esteem can be negatively influenced by both the disability itself and societal reactions to it [2,3].

Social factors play a critical role in shaping the sexual experiences of women with disabilities [4]. Stereotypes and stigma can lead to social exclusion and isolation, significantly diminishing opportunities for sexual expression and intimate relationships. Economically, women with disabilities often encounter barriers to accessing comprehensive sexual health care, which is compounded by a general lack of resources and poverty, further restricting their ability to seek and obtain appropriate care [5].

Politically, policies and legislation may not adequately address, or may even ignore, the sexual rights of disabled individuals. There is a critical need for inclusive policies that explicitly consider the sexual health rights of women with disabilities, ensuring they have equal access to information, education, and healthcare services [6,7].

The absence of family support and adequate healthcare exacerbates these issues [8,9]. Families may lack understanding or be uncomfortable discussing sexual matters, particularly with members who have disabilities, leading to a significant gap in sex education. This is especially detrimental as the family can play a pivotal role in shaping one's sexual knowledge and attitudes. In healthcare settings, professionals often overlook the sexual health concerns of disabled women due to discomfort, prejudice, or lack of training. This neglect is not just a failure in care but also a denial of basic human rights, as sexual health is integral to overall well-being [10].

Moreover, the under-researched areas of sexual dysfunction in women with disabilities highlight a significant gap in medical research and understanding. While some studies focus on the physiological aspects of sexual dysfunction, there is a sparse exploration of the psychological and social impacts, which are equally crucial [11]. For instance, depression, anxiety, and low self-esteem, commonly reported among women with disabilities, are often closely linked to sexual dissatisfaction and dysfunction [12,13]. Women who have disabilities, including those with spinal cord injuries or congenital conditions like spina bifida, often encounter societal biases that call into question their capacity to engage in sexual activities, bear children, and take on roles typically assumed by individuals without disabilities. These societal prejudices lead to a plethora of problems, which extend from limited access to healthcare to emotional and psychological obstacles that intensify the inherent hardships associated with their physical limitations.

Research indicates that there is a substantial prevalence of sexual dysfunction among women who have disabilities, which is closely connected to both physical and psychological factors [14,15,16]. Specifically, neurological disorders like multiple sclerosis (MS) can result in primary sexual dysfunctions as a consequence of direct neurological damage that affects sexual response. Secondary dysfunctions arise from symptoms of the disease itself, such as fatigue and pain, while tertiary impacts are related to psychological and social perceptions.

Sexual dysfunction in women with MS and other disabilities can result in decreased libido, difficulty achieving orgasm, and other sensory impairments, which collectively degrade sexual satisfaction and overall quality of life. These dysfunctions often intensify feelings of inadequacy and depression, particularly as societal ideals of beauty and perfection create additional barriers.

Despite the clear impact on quality of life, the body of research concerning sexual health and disability, particularly among women, remains limited. Research conducted in this area, including a systematic review and meta-analysis on the global prevalence of female sexual dysfunction (FSD) in women with MS, suggests a significant prevalence of sexual dysfunction [17]. Such studies underscore the need for greater attention from health policymakers and the implementation of effective health interventions.

The primary objective of this research is to investigate the intricate nature of sexuality in women with disabilities, with a specific focus on those diagnosed with MS. Through the use of an international literature review and quantitative research conducted through questionnaires administered to a group of Greek women with MS, the study examines various aspects of sexual health. These include sexual desires, perceptions, and physical and mental satisfaction.

The methodologies implemented in the study encompass the utilization of validated questionnaires, such as the Female Sexual Function Index (FSFI) and the Multiple Sclerosis Intimacy and Sexuality Questionnaire-19 (MSISQ-19), which are designed to quantitatively assess the influence of MS on sexual desire, activity, and satisfaction [18,19]. Furthermore, an exhaustive examination of the existing literature was conducted, which aimed to recognize areas of inadequacy within prior research and served to provide a more comprehensive backdrop for the study's outcomes.

This research is poised to make a significant contribution to the field of sexual health in women with disabilities, particularly those impacted by MS. Despite the limitations of a small sample size and potential biases in questionnaire design, the study employs rigorous statistical methods and validated measures, allowing for a comprehensive investigation of the issues at stake. By examining the intersection of disability and sexual health, the study aims to inform and optimize counseling practices, ultimately enhancing sexual satisfaction and overall quality of life for this populace.

2. Materials and Methods

To ensure the accessibility and reach of our study, various venues, and approaches were considered for disseminating the questionnaires among female patients with MS. One effective method was to collaborate with MS Clinics and Hospitals that specialize in treating MS patients. These institutions often have established relationships with patients, making recruiting participants for research studies easier. We worked closely with healthcare providers to distribute the questionnaires during appointments. Additionally, MS Support Groups and Organizations, as well as Online Platforms, were utilized to target individuals with MS. By leveraging forums, and MS-specific online communities, we were able to reach our intended audience effectively. The study sample consists of 130 women with multiple sclerosis disability, who live in the wider area of Attica and various cities in Greece.

To confirm the reliability of the questionnaires, we utilized well-established, globally recognized research tools from existing literary sources. Moreover, content and conceptual validity evaluations were executed to verify that the Likert scales accurately represented the intended concepts and aligned with the literature. The psychometric tools used in this research to collect the data were self-administered questionnaires: A Demographic Information and Medical History Questionnaire, the Female Sexual Function Index (FSFI) Questionnaire, the Fatigue Severity Scale, and the Intimacy and Sexuality Questionnaire-19 (MSISQ-19) [18,19,20]. Convenience sampling, a form of non-probability sampling, was employed due to its ease of access to the target population, particularly suitable for this study [21].

A formal application for the approval of the research plan and methodology was submitted to the scientific council of the University of West Attica Ethics Committee, with the assurance that it adheres to the guidelines outlined in the General Data Protection Regulation (GDPR) [95813/18-10-2023]. Participants were furnished with questionnaires along with an informative brochure that emphasized the voluntary nature of their involvement in the study. The participants' personal information and responses were treated with utmost confidentiality and anonymity, and all accumulated data were erased after the survey. Additionally, participants were apprised of their right to withdraw from the research at any point and received comprehensive information regarding the objectives and aims of the study.

Recognizing that completing the questionnaires was time-intensive, participants were given the option to either complete them immediately or outside of the hospital setting. Completed questionnaires were returned to the researcher during subsequent in-person appointments. Participants received instructions from the researcher regarding questionnaire completion, emphasizing the importance of answering spontaneously and honestly to ensure accurate data collection.

The Demographic Information and Medical History Questionnaire aimed to gather demographic and disease-related data to delineate the profile of the participants. The Female Sexual Function Index (FSFI) Questionnaire, developed by Rosen et al., focused on assessing female sexual function. This questionnaire was designed to provide a concise, valid, and reliable self-report measure of female sexual function suitable for administration across a broad age range, including postmenopausal women. Comprising nineteen questions with closed-ended responses, the FSFI addresses the multidimensional nature of female sexual function [20].

The Fatigue Severity Scale (FSS) measured fatigue related to physical function, exercise, work, and family or social life, a common symptom experienced by individuals with MS. Developed to diagnose MS-related fatigue symptoms, the FSS is a self-report tool consisting of nine questions, taking approximately five minutes to complete and score. The questionnaire evaluates fatigue symptoms across various domains and employs a rating scale ranging from 1 (strongly disagree) to 7 (strongly agree), with the final score providing insight into the severity of fatigue symptoms [18].

The Intimacy and Sexuality Questionnaire-19 (MSISQ-19) assessed the sexuality and intimacy of individuals with MS. Using a Likert scale ranging from 1 (never interfered) to 5 (always interfered), this questionnaire, developed by Sanders et al., addresses the impact of MS on sexual function across primary, secondary, and tertiary levels. It identifies issues such as reduced genital sensation, diminished sex drive, fatigue, bladder problems, spasticity, psychological distress, and overall well-

being. Participants are encouraged to discuss questions marked with a score of 4 or 5 with healthcare providers to facilitate appropriate interventions for managing sexual function symptoms [19].

Quantitative variables were expressed as mean (Standard Deviation) and median (interquartile range). Qualitative variables were expressed as absolute and relative frequencies. Spearman correlation coefficients were used to explore the association of two continuous variables. Multiple linear regression analyses were used with dependent the FSS, MSISQ-19, and FSFI scales. The regression equation included terms for patients' characteristics. Moreover, when MSISQ-19 subscales were used as dependent variables, FSS was also entered into the model as an independent variable. When FSFI subscales were used as dependent variables, FSS and MSISQ-19 scales were also entered into the model as independent variables. Adjusted regression coefficients (β) with standard errors (SE) were computed from the results of the linear regression analyses. Logarithmic transformations of the dependent variables were used in multiple regression analysis. All reported p values are two-tailed. Statistical significance was set at $p<0.05$ and analyses were conducted using SPSS statistical software (version 22.0).

3. Results

The sample in this study consisted of 130 female patients, whose characteristics are presented in Table 1. The majority of the sample (56.2%) was between the ages of 35 and 50. The results of this study indicate that 40.8% of the patients held a Master's or PhD degree, and 76.2% were either married or cohabiting with their partner. Additionally, 63.8% of the patients had children, and approximately four out of ten patients (25.4%) were in menopause. The average time from the onset of symptoms was 12.2 years, with a standard deviation of 8.1 years. Moreover, 87.7% of the patients were diagnosed more than one year prior. Furthermore, 90% of the patients were under regular treatment for MS. Approximately half (41.5%) of the sample reported being physically active, and 55.4% had seen a therapist in the past or were currently under their care. Lastly, 60% of the sample had previously received or were currently receiving other regular treatment.

Table 1. Patients' characteristics.

	N (%)
Age	
18-24	6 (4.6)
25-34	31 (23.8)
35-50	73 (56.2)
50+	20 (15.4)
Educational level	
High school at most	45 (34.6)
University	32 (24.6)
MSc/ PhD	53 (40.8)
Married/ Living together with partner	99 (76.2)
Children	83 (63.8)
Number of children	
1	36 (43.4)
2	40 (48.2)
3	6 (7.2)
4	1 (1.2)
Menopause	33 (25.4)

Time from symptoms onset (years), mean (SD)	12.2 (8.1)
Time of diagnosis	
Last week	0 (0)
Last month	0 (0)
More than a month	1 (0.8)
Last trimester	2 (1.5)
More than six months	9 (6.9)
Within last year	4 (3.1)
More than a year	114 (87.7)
Type of treatment	
Regularly	117 (90.0)
Depending on the course of the disease	13 (10.0)
Physically active	54 (41.5)
Therapist session	
No	58 (44.6)
Yes in the past	49 (37.7)
Yes in the present	23 (17.7)
Other regular treatments in the past	50 (38.5)
Other regular treatments in the present	73 (56.2)
Other regular treatments in the past and/or in the present	78 (60.0)
If yes, what type	
Antidepressants	28 (38.4)
Anti-anxiety	13 (17.8)
Other	32 (43.8)

The results of the descriptive measures for the FSFI, MSISQ-19, and FSS subscales are shown in Table 2. The mean score for the FSS was 44.92 (SD=11.39), and 83.8% (N=109) of the participants experienced severe fatigue (i.e. a score of at least 36). Additionally, the mean total score for the FSFI was 20.8 (SD=9.36).

Table 2. Descriptive measures of FSFI, MSISQ-19, and FSS subscales.

	Minimum	Maximum	Mean (SD)	Median (IQR)
Primary sexual dysfunction subscale	5.00	25.00	11.82 (5.26)	11 (8 – 14)
Secondary sexual dysfunction subscale	9.00	42.00	16.97 (6.97)	15 (12 – 21)
Tertiary sexual dysfunction subscale	5.00	25.00	10.85 (5.38)	9 (7 – 14)
Fatigue severity scale	9.00	63.00	44.92 (11.39)	45 (40 – 53)
Desire	1.20	6.00	3.47 (1.49)	3.6 (2.4 – 4.8)
Arousal	0.00	6.00	3.39 (1.97)	3.6 (1.8 – 5.1)
Lubrication	0.00	5.10	3.39 (1.7)	4.2 (3 – 4.8)
Orgasm	0.00	6.00	3.45 (2.05)	3.6 (1.6 – 5.2)
Satisfaction	.80	6.00	3.24 (1.49)	3.6 (2 – 4.4)
Pain	0.00	6.00	3.87 (2.28)	4.8 (2 – 6)
Total FSFI score	2.00	32.60	20.8 (9.36)	23.05 (16.9 – 28.5)

Sexual dysfunction demonstrated a strong, negative correlation with all sub-scales of the FSFI, indicating that higher levels of sexual dysfunction were associated with a lower quality of sex life (Table 3). Moreover, increased levels of fatigue were significantly linked to a poorer quality of sex life.

Table 3. Correlation of FSFI subscales with MSISQ-19 and FSS scales.

		Primary sexual dysfunction subscale	Secondary sexual dysfunction subscale	Tertiary sexual dysfunction subscale	Fatigue severity scale
Desire	r	-.40	-.16	-.10	-.16
	P	<.001	.062	.243	.077
Arousal	r	-.56	-.33	-.21	-.27
	P	<.001	<.001	.016	.002
Lubrication	r	-.43	-.30	-.14	-.19
	P	<.001	.001	.109	.028
Orgasm	r	-.56	-.39	-.28	-.29
	P	<.001	<.001	.001	.001
Satisfaction	r	-.38	-.25	-.12	-.20
	P	<.001	.004	.177	.020
Pain	r	-.31	-.25	-.18	-.09
	P	<.001	.004	.046	.317
Total FSFI score	r	-.59	-.36	-.24	-.23
	P	<.001	<.001	.005	.008

The data disclosed a substantially greater degree of fatigue in university alumni when contrasted with MSc/PhD bearers (Table 4). Furthermore, female subjects who had their diagnosis for more than one year and those who were receiving or had received other regular treatments conveyed a higher level of fatigue.

Table 4. Multiple linear regression analysis results with the FSS scale as a dependent variable and patient's characteristics as independent variables.

		Fatigue severity scale	
		β (SE)+	P
Age	50+ (reference)		
	18-34	0.003 (0.061)	.958
	35-50	0.005 (0.048)	.916
Married/ Living together	No (reference)		
	Yes	0.027 (0.033)	.407
Educational level	MSc/ PhD (reference)		
	High school at most	0.042 (0.031)	.175
	University	0.081 (0.033)	.016
Children	No (reference)		
	Yes	-0.016 (0.035)	.651
Menopause	No (reference)		
	Yes	0.055 (0.040)	.167
Time of diagnosis	Within one year (reference)		

Type of treatment	More than a year	0.108 (0.039)	.035
	Regularly (reference)		
	Depending on the course of the disease	-0.061 (0.047)	.195
Therapist session	No (reference)		
	Yes	0.022 (0.026)	.401
Other regular treatment in the past/in the present	No (reference)		
	Yes	0.050 (0.025)	.041

All of the subscales related to sexual dysfunction exhibited a correlation with the FSS scale, such that a greater degree of fatigue was associated with a higher incidence of sexual dysfunction (Table 5). Furthermore, those who were married or cohabiting with their partner had lower scores in both the secondary and tertiary sexual dysfunction subscales. Conversely, individuals with children exhibited higher scores in the primary sexual dysfunction subscale. Additionally, cases who had the diagnosis for more than one year showed greater scores in the primary sexual dysfunction subscale.

Table 5. Multiple linear regression analysis results with MSISQ-19 subscales as dependent variables and patients' characteristics and FSS scale as independent variables.

		Primary	sexual	Secondary	sexual	Tertiary	sexual
		dysfunction subscale		dysfunction subscale		dysfunction subscale	
	β (SE)+	P	β (SE)+	P	β (SE)+	P	
Age		50+ (reference)					
	18-34	0.056 (0.079)	.477	-0.045 (0.063)	.473	0.070 (0.084)	.410
	35-50	0.060 (0.063)	.337	-0.055 (0.049)	.273	0.054 (0.067)	.416
Married/ Living together		No (reference)					
	Yes	-0.003 (0.042)	.936	-0.065 (0.033)	.050	-0.115 (0.045)	.012
Educational level		MSc/ PhD (reference)					
	High school at most	-0.034 (0.040)	.397	0.027 (0.032)	.406	-0.003 (0.043)	.940
	University	-0.047 (0.044)	.289	-0.032 (0.035)	.367	0.004 (0.047)	.940
Children		No (reference)					
	Yes	0.079 (0.035)	.045	0.013 (0.036)	.719	0.040 (0.048)	.403
Menopause		No (reference)					
	Yes	0.02 (0.052)	.699	-0.032 (0.041)	.438	0.048 (0.055)	.386
Time of diagnosis		Within one year (reference)					
	More than a year	0.106 (0.052)	.035	0.056 (0.044)	.202	0.061 (0.059)	.299
Type of treatment		Regularly (reference)					
	Depending on the course of the disease	0.116 (0.061)	.057	-0.004 (0.048)	.939	0.017 (0.064)	.793
Therapist session		No (reference)					
	Yes	0.009 (0.034)	.792	0.026 (0.027)	.338	0.042 (0.036)	.246
Other regular treatments in the past/in the present		No (reference)					
	Yes	0.042 (0.036)	.252	-0.013 (0.029)	.652	-0.004 (0.038)	.924

Fatigue severity scale	0.005 (0.002)	.002	0.007 (0.001)	<.001	0.005 (0.002)	.003
+regression coefficient (Standard Error).						

Married or cohabiting women demonstrated distinctly higher levels of sexual fulfillment (Table 6). The menopausal patients exhibited conspicuously lower scores in the domains of Desire, Lubrication, Orgasm, Satisfaction, and Pain. Moreover, their total FSFI score was notably lower, suggesting a diminished quality of sexual life in these areas and overall. The Primary sexual dysfunction subscale was significantly related to lower scores in Desire, Arousal, Orgasm, Satisfaction, and the Total FSFI score. Moreover, a higher score in the tertiary sexual dysfunction subscale was associated with lower scores in the Desire and Satisfaction subscales. Participants with children recorded lower Arousal scores, while Desire, Arousal, Satisfaction, and Total FSFI scores were lower in cases with a diagnosis duration of more than one year. Regression analysis further showed that those with treatment depending on the disease course had significantly lower Lubrication and Satisfaction scores compared to those with regular treatment.

Table 6. Multiple linear regression analysis results with FSFI subscales as dependent variables and patients' characteristics, MSISQ-19 subscales, and FSS scale as independent variables

	More than a year	-0.15 (0.059)	.012	-0.16 (0.073)	.039	-0.014 (0.074)	.855	-0.028 (0.076)	.710	-0.151 (0.074)	.040	0.045 (0.088)	.610	-0.191 (0.090)	.029
Type of treatment	Regularly (reference)														
	Depending on the course of the disease	-0.050 (0.068)	.460	-0.038 (0.082)	.641	-0.19 (0.078)	.017	-0.080 (0.085)	.347	-0.22(0.84)	.010	-0.052 (0.099)	.596	-0.18 (0.100)	.082
Therapist session	No (reference)														
	Yes	-0.017 (0.038)	.643	-0.036 (0.045)	.424	-0.013 (0.046)	.773	-0.057 (0.047)	.227	-0.078 (0.049)	.118	-0.009 (0.054)	.864	-0.032 (0.06)	.594
Other regular treatments in the past/in the present	No (reference)														
	Yes	0.002 (0.04)	.956	-0.055 (0.048)	.256	-0.027 (0.048)	.573	-0.029 (0.050)	.566	-0.003 (0.053)	.957	-0.016 (0.058)	.785	-0.026 (0.064)	.685
Primary sexual dysfunction subscale		-0,019 (0,005)	<.001	-0.019 (0.006)	.002	-0.009 (0.006)	.136	-0.016 (0.006)	.009	-0.011 (0.006)	.046	-0.004 (0.007)	.532	-0.016 (0.008)	.035
Secondary sexual dysfunction subscale		-0,001 (0,005)	.878	0.000 (0.006)	.957	-0.005 (0.006)	.341	-0.004 (0.006)	.474	-0.008 (0.006)	.208	-0.012 (0.007)	.065	-0.008 (0.007)	.269
Tertiary sexual dysfunction subscale		-0,010 (0,005)	.047	-0.007 (0.006)	.245	-0.007 (0.006)	.248	-0.007 (0.007)	.302	-0.013 (0.007)	.044	-0.007 (0.008)	.369	-0.014 (0.008)	.098
Fatigue severity scale		0.000 (0.002)	.816	-0.002 (0.002)	.315	-0.003 (0.002)	.248	-0.003 (0.002)	.207	-0.001 (0.002)	.597	0.001 (0.003)	.773	-0.002 (0.003)	.424

+regression coefficient (Standard Error).

4. Discussion

The findings of this research offer essential information regarding the sexual functioning of women with multiple sclerosis (MS) and the influence of fatigue and demographic factors on sexual functioning. In our sample, the majority of patients were between 35 and 50 years old, married or cohabiting with a partner, and had children. These demographic characteristics are in alignment with prior studies on MS patients [22, 23]. Our results indicated that sexual dysfunction was present in the sample, as demonstrated by the mean FSFI score of 20.8, which falls below the threshold for sexual dysfunction. This is consistent with previous research that has reported sexual dysfunction in MS patients [23, 24]. Our study also revealed a significant association between sexual dysfunction and fatigue, a finding that aligns with prior research suggesting that fatigue is a significant predictor of sexual dysfunction in MS patients [23].

Our study results showed that individuals experiencing greater fatigue tended to have lower quality of sex life across all FSFI subscales. This finding lines up with previous research, which has demonstrated that fatigue serves as a significant predictor of diminished sexual functioning in MS patients [23]. The findings of our research demonstrated that university alumni experienced a greater degree of fatigue than MSc/PhD holders. Moreover, those who had been diagnosed for a longer period of time and those receiving other regular treatments reported higher levels of fatigue. These findings suggest that demographic factors, including education level and time since diagnosis, may also play a role in influencing fatigue levels in MS patients.

Our study presented that individuals who were either married or cohabiting exhibited lower scores in the secondary and tertiary sexual dysfunction subscales, whereas those with children showed higher scores in the primary sexual dysfunction subscale. These findings imply that the presence of a partner and children may exert distinct influences on the sexual functioning of MS patients. Moreover, married or cohabiting women demonstrated higher levels of sexual satisfaction, an outcome that aligns with prior research indicating that social support may mitigate the adverse effects of MS on sexual functioning [24].

Our research outcomes concur with previous studies, demonstrating that postmenopausal women typically record lower scores in the domains of desire, lubrication, orgasm, satisfaction, pain, and overall FSFI score [22]. These findings corroborate the notion that menopause is associated with sexual dysfunction in females.

Upon diving deeper into the analysis of the research outcomes, it becomes evident that the interplay between demographic variables and the experience of MS plays a pivotal role in shaping the sexual functioning of women with disabilities. The results indicating a substantial association between sexual dysfunction and fatigue illuminate the intricate connection between physical symptoms and sexual well-being. This underscores the need for comprehensive approaches to addressing the sexual needs of women living with MS, taking into account not only the physiological dimensions but also the impact of fatigue and other factors on their sexual functioning. The complexities of fatigue in MS patients are highlighted by the variations in fatigue levels among individuals with different educational backgrounds and lengths of time since diagnosis. Comprehending these factors could lead to the development of personalized interventions and support strategies that target the impact of fatigue on sexual functioning and overall quality of life for women with disabilities and MS.

Furthermore, the distinct impacts of having a partner and children on the sexual functioning of MS patients illustrate the intricate nature of interpersonal relationships and their influence on sexual satisfaction and dysfunction in this population. The necessity of providing tailored support to disabled women who aspire to become mothers is emphasized by the inherent complexity of their circumstances. Women with disabilities, such as MS, confront distinct obstacles that can impact their reproductive health and parenting experiences in unique ways. These may include physical limitations, fatigue, and the effects of medication on fertility and pregnancy. Supportive measures should therefore encompass both medical and psychosocial aspects to ensure that these women can pursue parenthood if they choose. This could involve specialized perinatal care services, counseling, and adaptive parenting resources that cater specifically to their needs. By recognizing and addressing

the specific challenges faced by disabled women in their reproductive choices, maternity care providers and support systems can significantly enhance their quality of life and empower them in their personal and familial roles.

Transitioning from the reproductive challenges faced by women with disabilities, it's also important to consider how age-related changes can further complicate their experiences. On the other hand, the connection between postmenopausal status and lower scores across numerous domains of sexual functioning aligns with the broader literature on women's health and menopause. This contributes to the expanding body of evidence supporting the need for specialized interventions and support systems targeting the sexual well-being of postmenopausal women, particularly those living with chronic conditions such as MS.

It is important to note that this study has some limitations. The sample size was relatively small, which may limit the generalizability of the results. Additionally, the study relied on self-report measures, which may be subject to response bias. Future research with larger samples and more objective measures may be helpful in further exploring the relationship between sexual dysfunction, fatigue, and demographic factors in women with MS. Forthcoming research initiatives should build upon the results of this study by investigating the intricate relationship between demographic factors and the experience of MS, to gain a deeper understanding of the complexities of sexual functioning among women with disabilities. Conducting longitudinal studies that track the evolution of sexual functioning over time in response to fluctuating levels of fatigue, alterations in relationship dynamics, and the onset of menopause may yield significant and informative perspectives on the long-term implications of these factors.

Interventions designed to address the unique needs of women with disabilities and MS should consider adopting a multidimensional approach that encompasses the physical, emotional, and interpersonal aspects of sexual well-being. Such interventions should consider incorporating educational and support programs that aim to alleviate fatigue and manage the effects of menopause, as these factors can contribute to enhancing the overall sexual satisfaction and quality of life for this population. It is essential to recognize that the experiences of women with disabilities and MS can vary widely, and interventions should be tailored to meet the specific needs of individuals within this population.

In addition, exploring the efficacy of couple-based interventions and support systems that recognize the distinct influences of the presence of a partner and children on the sexual functioning of women with MS can offer valuable insights into enhancing the interpersonal dynamics and sexual satisfaction within these relationships. Taking into account the aforementioned information, future initiatives and research ought to concentrate on creating customized support systems that address both the physiological and emotional aspects of sexual health in females afflicted with MS. This involves incorporating the services of midwives as primary healthcare providers, who can play a crucial part in delivering comprehensive care that concentrates on sexual health. Midwives are endowed with a remarkable level of expertise in women's health, allowing them to competently handle an extensive array of issues comprehensively. By providing guidance and support that encompasses not only the management of physical symptoms but also the emotional and relational aspects, midwives are uniquely positioned to offer a holistic approach to care. The investigation of partner-oriented interventions may offer valuable insights into the influence of relational factors on sexual satisfaction. In general, a sustained commitment to research and the development of comprehensive, personalized care that incorporates the indispensable role of midwives can result in improved support for women with disabilities, ultimately ensuring that their sexual health needs are met with sensitivity and inclusivity.

This research highlights the need for targeted interventions, ongoing research efforts, and comprehensive support systems that address the sexual well-being of women with disabilities and MS holistically. Through the incorporation of these insights into practice and policy, the field of sexual health and disability can progress towards a more inclusive and supportive approach that acknowledges the distinct experiences and obstacles confronted by this group of individuals [25, 26, 27].

It is essential to challenge the myths, stereotypes, and prejudices that surround sexuality and disability. Research indicates that sexual dysfunction is highly prevalent in women with multiple sclerosis, yet there is a significant scarcity of knowledge regarding therapeutic options [28]. This

dearth of knowledge can perpetuate the marginalization and neglect of sexual health issues in women with MS, impeding their overall well-being and quality of life. The intersectionality of disability with other identity facets—such as race, ethnicity, age, and socioeconomic status—further complicates these issues. Women with disabilities are not a monolithic group; their experiences of sexuality and intimacy can vary widely depending on these intersecting identities, each adding layers of complexity to their sexual health needs. A deeper analysis reveals that the issues surrounding the sexuality of women with disabilities are multi-dimensional and require a holistic approach to address effectively. There is an urgent need for more comprehensive research, better-informed policies, and more inclusive healthcare practices that recognize and respect the sexual rights of all women, particularly those who are disabled. Addressing these needs not only improves individual well-being but also enriches societal health by fostering inclusivity, empathy, and respect for diversity in human sexuality.

5. Conclusions

This research has highlighted the substantial impact of fatigue and demographic factors on the sexual functioning of women with MS, revealing a complex interplay between physical symptoms and sexual well-being. The study has shown that fatigue, which is influenced by variables such as educational attainment and time since diagnosis, plays a critical role in the prevalence of sexual dysfunction among this demographic. Additionally, the intricate influences of familial and social support systems, including the presence of a partner and children, provide insights into the diverse experiences of sexual satisfaction and dysfunction. These findings underscore the importance of adopting a nuanced approach in addressing the sexual health needs of women with MS, incorporating both the medical and psychosocial dimensions to enhance their quality of life.

Sexual health is an essential aspect of human life that requires attention and support from families, society, and health systems. Women with disabilities deserve appropriate sexual education and training to facilitate their sexual expression and satisfaction. Furthermore, the impact of diseases such as MS on sexual function requires appropriate treatment and support to maintain quality of life. Delving into the intricate interplay of demographic factors, fatigue, and interpersonal dynamics among women with disability and MS provides a comprehensive understanding of the complexities that shape their sexual experiences. This depth of analysis not only enriches the current body of research but also offers valuable insights for developing targeted interventions and support frameworks to enhance the sexual well-being of this population.

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References

1. Baptista, RS, Pagliuca, LMF, Sampaio, AFA, França, ISX de. Sexuality: Experience of Women with Physical Disabilities. *Open J Nurs.* **2014**, 04, 13, 920–7.
2. Streur, CS, Schafer, CL, Garcia, VP, Quint, EH, Sandberg, DE, Wittmann, DA. "If Everyone Else is Having This Talk with Their Doctor, Why Am I Not Having This Talk with Mine?": The Experiences of Sexuality and Sexual Health Education of Young Women with Spina Bifida. *J Sex Med.* **2019** 16, 6, 853–9.

3. Rugoho, T, Maphosa, F. Challenges faced by women with disabilities in accessing sexual and reproductive health in Zimbabwe: The case of Chitungwiza town. *Afr J Disabil.* **2017** May;26,6:252.
4. World Health Organization. Reproductive health indicators : guidelines for their generation, interpretation and analysis for global monitoring. **2006**, 63.
5. Sathyaranarana Rao, T, Nagaraj, AK. Female sexuality. *Indian J Psychiatry* **2015**, 57,6, 296.
6. Wylie, K. Sexuality: it's not just sex. *J R Soc Med.* **2007** Jul;100, 7, 300–300.
7. Coverdale, JH, Balon, R, Roberts, LW. Teaching Sexual History-Taking: A Systematic Review of Educational Programs: *Acad Med.* **2011** Dec, 86, 12, 1590–5.
8. Mollaioli, D, Ciocca, G, Limoncin, E, Di Sante, S, Gravina, GL, Carosa, E, et al. Lifestyles and sexuality in men and women: the gender perspective in sexual medicine. *Reprod Biol Endocrinol.* **2020** Dec, 18, 1, 10.
9. Nosek, MA, Rintala, DH, Young, ME, Howland, CA, Clubb Foley, C, Rossi, D, et al. Sexual functioning among women with physical disabilities. *Arch Phys Med Rehabil.* **1996** Feb; 77, 2, 107–15.
10. Bloom, TL, Mosher, W, Alhusen, J, Lantos, H, Hughes, RB. Fertility Desires and Intentions Among U.S. Women by Disability Status: Findings from the 2011–2013 National Survey of Family Growth. *Matern Child Health J* **2017** Aug;21, 8, 1606–15.
11. Nazari, F, Shaygannejad, V, Mohammadi, Sichani, M, Mansourian, M, Hajhashemi, V. Sexual dysfunction in women with multiple sclerosis: prevalence and impact on quality of life. *BMC Urol* **2020** Dec;20, 1, 15.
12. Guo, ZN, He, SY, Zhang, HL, Wu, J, Yang, Y. Multiple sclerosis and sexual dysfunction. *Asian J Androl* **2012** Jul;14, 4, 530–5.
13. Mohammadi, K, Rahnama, P, Rafei, Z, Ebrahimi-Aveh, SM, Montazeri, A. Factors associated with intimacy and sexuality among young women with multiple sclerosis. *Reprod Health* **2020** Dec;17,1,110.
14. Zamani, M, Tavoli, A, Yazd Khasti, B, Sedighimornani, N, Zafar, M. Sexual Therapy for Women with Multiple Sclerosis and Its Impact on Quality of Life. *Iran J Psychiatry* **2017** Jan;12, 1, 58–65.
15. Bronner, G, Elran, E, Golomb, J, Korczyn, AD. Female sexuality in multiple sclerosis: the multidimensional nature of the problem and the intervention. *Acta Neurol Scand.* **2010** May;121, 5, 289–301.
16. Najafidoulatabad, S, Mohebbi, Z, Nooryan, K. Yoga Effects on Physical Activity and Sexual Satisfaction among Iranian Women with Multiple Sclerosis: A Randomized Controlled Trial. *Afr J Tradit Complement Altern Med.* **2014** Oct 27, 11,5, 78.
17. Salari, N, Hasheminezhad, R, Abdolmaleki, A, Kiaei, A, Razazian, N, Shohaimi, S, et al. The global prevalence of sexual dysfunction in women with multiple sclerosis: a systematic review and meta-analysis. *Neurol Sci.* **2023** Jan;44,1,59–66.
18. Krupp, LB, LaRocca, NG, Muir-Nash, J, Steinberg, AD. The fatigue severity scale. Application to patients with multiple sclerosis and systemic lupus erythematosus. *Arch Neurol.* **1989** Oct;46,10,1121–3.
19. Sanders, AS, Foley, FW, LaRocca, NG, Zemon, V. The multiple sclerosis intimacy and sexuality questionnaire-19 (MSISQ-19). *Sex Disabil.* **2000** 18,1, 3–26.
20. Rosen, C, Brown, J, Heiman, S, Leib R. The Female Sexual Function Index (FSFI): A Multidimensional Self-Report Instrument for the Assessment of Female Sexual Function. *J Sex Marital Ther.* **2000** Apr;26, 2, 191–208.
21. Creswell, JW. Educational research: planning, conducting, and evaluating quantitative and qualitative research. 4th ed. Boston: Pearson; **2012**. 650 p.
22. Fereshtehnejad, S. M., Ghaffari, M., Aarabi, M. H., et al. Exploring the sexuality of women with multiple sclerosis. *Multiple Sclerosis and Related Disorders* **2020** 45, 102376.
23. Bozman, A. W., Alschuler, K. N., Fenton, B., & Ehde, D. M. Sexual dysfunction in multiple sclerosis: A systematic review and meta-analysis. *Multiple Sclerosis and Related Disorders* **2016**, 10, 103–18.
24. Bostwick, J. M., & Kaskutas, L.A. Sexual dysfunction in multiple sclerosis. *Archives of Neurology* **1997**, 54, 12, 1474–8.
25. Yilmaz, S. D., Gumus, H., Odabas, F. O., Akkurt, H. E., & Yilmaz, H. Sexual Life of Women with Multiple Sclerosis: A Qualitative Study. *International Journal of Sexual Health* **2017**, 29, 2, 147–154.
26. Bartnik, P., Wielgoś, A., Kacperczyk, J., Pisarz, K., Szymusik, I., Podlecka-Piętowska, A., Zakrzewska-Pniewska, B., & Wielgoś, M. Sexual dysfunction in female patients with relapsing-remitting multiple sclerosis. *Brain and Behavior* **2017**, 7, e00699.

27. Marck, C H., Jelinek, P., Weiland, T J., Hocking, J S., Livera, A M D., Taylor, K L., Neate, S., Pereira, N G., & Jelinek, G A. Sexual function in multiple sclerosis and associations with demographic, disease and lifestyle characteristics: an international cross-sectional study. *BMC Neurol* 2016, 16, 210
28. Lew-Starowicz, M., & Rola, R. Therapy of female sexual dysfunction in multiple sclerosis. *Menopause Review* 2013, 12, 166-174

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