SEX DIFFERENCES IN PREDICTORS OF ILLNESS INTRUSIVENESS IN PERSONS WITH MULTIPLE SCLEROSIS

Lindsay O. Neto[1], Elizabeth S. Gromisch[1], Jessica Sloan[2], Tuula Tyry[3], Frederick W. Foley[2,4]

[1] Mandell Center for Multiple Sclerosis Care and Neuroscience Research, Mount Sinai Rehabilitation Hospital, Trinity Health Of New England, Hartford, CT, United States
[2] Ferkauf Graduate School of Psychology, Yeshiva University, Bronx, NY, United States
[3] Dignity Health, St. Joseph's Hospital and Medical Center, Phoenix, AZ, United States
[4] Holy Name Medical Center Multiple Sclerosis Center, Teaneck, NJ, United States

Contact Information: Elizabeth S. Gromisch, Elizabeth.Gromisch@stfranciscare.org

Background

Multiple sclerosis (MS) is a complex, chronic disease that targets the central nervous system. Persons with MS (PwMS) may experience a diverse number of symptoms which adversely affect cognitive and physical function. Studies suggest that the nature of the disease course and debilitating effects MS symptoms may have on daily activities and wellbeing can compromise quality of life (QOL) in PwMS[1-3]. Additionally, sex differences surround QOL issues in PwMS. While both men and women with MS report having a lower QOL than those with any other chronic diseases[1-3], issues such as physical limitations of the disease and disability level have been noted to have a greater negative impact on QOL in men than women[4,5].

One underlying determinant of QOL in those faced with chronic disease, such as MS, is illness intrusiveness[6]. This construct examines how the disease and/or its related treatments disrupt individuals' engagement in interests and activities, which in turn affects psychological functioning[6]. There is evidence that PwMS experience higher levels of illness intrusiveness compared to other individuals with chronic conditions[7]; however, there has been limited research on differences by gender. Determining the life areas that are most impacted by MS and assessing how men and women may view this impact differently will be important for targeting gender-specific psychosocial interventions to improve quality of life in PwMS.

Objective

To assess sex differences in Illness Intrusiveness Rating Scale (IIRS) outcomes in a sample of PwMS.

Methods

Participants were primarily recruited using the North American Research Committee on Multiple Sclerosis (NARCOMS) Registry as part of a larger study. Inclusion criteria included 1) a diagnosis of MS, 2) being English-speaking, and 3) having no history of another major medical condition (i.e., another neurological condition). PwMS with a diagnosis of a mood or anxiety disorder could participate if their symptoms began after their MS diagnosis. NARCOMS staff sent a recruitment email to a random selection of 3,000 registry participants with a link to the study. A total of 1,038 PwMS signed the electronic consent; 114 of these participants were not included due to significant missing data (e.g., omission of MS diagnosis, sex, or full measures). As only two individuals identified as non-binary, they were excluded from these analyses due to small sample size. The study was approved by the Institutional Review Board at Albert Einstein College of Medicine of Yeshiva University.

Illness intrusiveness was measured using the Illness Intrusiveness Ratings Scale (IIRS), a 13-item self-report questionnaire (Figure 1)[6]. Using a Likert scale ranging from 1 (not very much) to 7 (very much), participants rated the impact of their MS and/or related treatments on their health, diet, work, active recreation, passive recreation, financial situation, relationship with spouse, sex life, family relations, other social relations, self-expression/self- improvement, religious expression, and community and civic involvement.

Participants completed the web-based survey anonymously. Analyses were conducted using the total score and three subscales (Relationship and Personal Development, Instrumental, and Intimacy), which were converted to z-scores using published MS norms[6]. Independent t-test determined differences in demographics, disease characteristics, and IIRS outcomes. Significant differences in the t-tests were then further examined using a hierarchical regression to assess whether sex was a significant predictor after accounting for age and disability level. Patient Determined Disease Steps (PDDS), a self- report scale ranging from 0 (normal) to 8 (bedridden) was used to assess level of disability. A p-value <0.01 was deemed significant for both the t-test and hierarchical regression. SPSS version 24 was used for all analyses.

Methods (Cont.)

Figure 1. Illness Intrusiveness Rating Scale[6]

The following items ask about how much your illness and/or its treatment interfere with different aspects of your life. **PLEASE CIRCLE THE ONE NUMBER THAT BEST DESCRIBES YOUR CURRENT LIFE SITUATION**. If an item is not applicable, please circle the number one (1) to indicate that this aspect of your life is not affected very much. Please do not leave any item unanswered. Thank you.

How much does your illness and/or its treatment interfere with your:

1. HEALTH
   Not Very Much 1 2 3 4 5 6 7 Very Much
2. DIET (i.e., the things you eat and drink)
   Not Very Much 1 2 3 4 5 6 7 Very Much
3. WORK
   Not Very Much 1 2 3 4 5 6 7 Very Much
4. ACTIVE RECREATION (e.g., sports)
   Not Very Much 1 2 3 4 5 6 7 Very Much
5. PASSIVE RECREATION (e.g., reading, listening to music)
   Not Very Much 1 2 3 4 5 6 7 Very Much
6. FINANCIAL SITUATION
   Not Very Much 1 2 3 4 5 6 7 Very Much
7. RELATIONSHIP WITH YOUR SPOUSE (girlfriend or boyfriend if not married)
   Not Very Much 1 2 3 4 5 6 7 Very Much
8. SEX LIFE
   Not Very Much 1 2 3 4 5 6 7 Very Much
9. FAMILY RELATIONS
   Not Very Much 1 2 3 4 5 6 7 Very Much
10. OTHER SOCIAL RELATIONS
    Not Very Much 1 2 3 4 5 6 7 Very Much
11. SELF-EXPRESSION/SELF-IMPROVEMENT
    Not Very Much 1 2 3 4 5 6 7 Very Much
12. RELIGIOUS EXPRESSION
    Not Very Much 1 2 3 4 5 6 7 Very Much
13. COMMUNITY AND CIVIC INVOLVEMENT
    Not Very Much 1 2 3 4 5 6 7 Very Much

Results

Table 1. Sample Characteristics of PwMS, *p-value < 0.01

	N(%) or Mean (s.d.)	Min – Max	t	df	p-value
Age (years), mean (s.d.)					
Female	55.81 (9.40)	26-83	-3.43	205.9	0.001*
Male	58.85 (10.05)	34-82			
Gender, n (%)					
Female	766 (82.2)				
Male	156 (16.7)				
Ethnicity, n (%)					
White	867 (94.0)				
African American/Black	15 (1.6)				
Asian/Alaska Native	1 (0.1)				
Hispanic/Latino	23 (2.5)				
American Indian	5 (0.5)				
Other	3 (0.3)				
Years of education completed, mean (s.d.)					
Female	15.76 (2.87)	3-27	-1.14	917.0	0.255
Male	16.05 (2.83)	5-25			
MS Subtype, n (%)					
Relapsing Remitting MS	575 (62.4)				
Secondary Progressive MS	237 (25.7)				
Primary Progressive MS	88 (9.5)				
Progressive Relapsing MS	22 (2.4)				
Duration of disease (years), n (%)					
Female	17.86 (9.32)	0-54	-0.835	918.0	0.404
Male	18.54 (8.60)	3-41			
PDDS (0-8), mean (s.d.)					
Female	3.43 (2.32)	0-8	-3.47	903	0.001*
Male	4.14 (2.25)	0-7			

Results (Cont.)

Significant sex differences were seen when comparing the IIRS Total Score and the Intimacy Subscale. Males scored higher in illness intrusiveness in the Total Score (t = -3.41, p < 0.01) and the Intimacy Subscale (t = -5.70, p < 0.01). No sex differences were seen with the Instrumental Subscale or Relationship and Personal Development Subscale.

Table 2. Summary of Hierarchical Regression Analysis for Variables Predicting Total IIRS scores, *p-value <0.01

	R^2		B(SE)	t	p
Step 1	0.00	Constant	0.02 (0.18)		
		Age	-0.00 (0.00)	-0.75	0.455
Step 2	0.24	Constant	0.18 (0.16)		
		Age	-0.02 (0.00)	-5.99	<0.001*
		PDDS	0.20 (0.01)	16.10	<0.001*
Step 3	0.24	Constant	0.04 (0.17)		
		Age	-0.02 (0.00)	-6.17	<0.001*
		PDDS	0.19 (0.01)	15.91	<0.001*
		Sex	0.15 (0.07)	2.14	0.033

Table 3. Summary of Hierarchical Regression Analysis for Variables Predicting IIRS Intimacy Subscale scores, *p-value <0.01

	R^2		B(SE)	t	p
Step 1	0.00	Constant	0.29 (0.16)		
		Age	-0.00 (0.00)	-0.37	0.709
Step 2	0.15	Constant	0.36 (0.15)		
		Age	-0.01 (0.00)	-3.97	<0.001*
		PDDS	0.13 (0.01)	12.13	<0.001*
Step 3	0.17	Constant	0.06 (0.16)		
		Age	-0.01 (0.00)	-4.44	<0.001*
		PDDS	0.13 (0.01)	11.85	<0.001*
		Sex	0.32 (0.07)	4.96	<0.001*

Discussion

In this national sample of PwMS, we found differences in the way men and women view the impact of their MS on their lives. Analyses determined that illness intrusiveness scores in the Total Score and Intimacy Subscale are higher for men than women. However, sex was only a significant predictor of the Intimacy Subscale after accounting for age and disability.

This study shows a need for interventions that bring awareness to issues with intimacy and sexual dysfunction in males as well as those that protect their psychosocial wellbeing. Future research may provide specific interventions for reducing the perceived impact MS has on the intimate lives of men living with MS.

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Acknowledgements