Gender Differences in Health Related Quality of Life in Multiple Sclerosis Patients with Increasing Disability

Allison LaRussa, BA, Alicia S Chua, MS, Brian C Healy, PhD, Fiona Stuart, BA, Kaitlynne Leclaire, BA, Riley Bove, MD, Maria K Houtchens, MD, Sandra Cook, RN, Tanuja Chitnis, MD, Howard L Weiner, MD, and Bonnie I Glanz, PhD

Partners Multiple Sclerosis Center, Brigham and Women's Hospital, Harvard Medical School, Boston, MA

Background

- Previous research has shown that greater disability is correlated with worse health related quality of life (HRQOL) in men, but this association is not always observed in women.
- In fact, when compared to men with high disability levels, women with high disability levels have reported better HRQOL on some patient reported outcome (PRO) measures.
- If these results could be validated, investigations of potential mechanisms would be important.

Objective

- To compare PROs between men and women with MS within low, medium, and high levels of disability.

Methods

Participants

- Participants in this analysis were subjects in the Comprehensive Longitudinal Investigation of Multiple Sclerosis at the Brigham and Women's Hospital (CLIMB) Study at the Partners MS Center, an ongoing prospective observational study.
- Subjects in the CLIMB study undergo EDSS disability evaluations as part of their annual neurologic exam; participants in this analysis completed PRO measures biennially .

Table 1. Cohort demographics and clinical characteristics

	All subjects	Women	Men	p-value†
N	322	225	97	
Age (years, (SD))	47.59 (11.14)	47.51 (11.16)	47.78 (11.15)	0.8425
Race (n, %)				0.3323
White	305 (94.72)	215 (95.56)	90 (92.78)	
Black	10 (3.11)	6 (2.67)	4 (4.12)	
Asian	1 (0.31)	0 (0.00)	1 (1.03)	
More than one race	4 (1.24)	2 (0.89)	2 (2.06)	
Unknown/unreported	2 (0.62)	2 (0.89)	0 (0.00)	
Ethnicity (n, %)				0.7613
Hispanic or latino	13 (4.04)	10 (4.44)	3 (3.09)	
Not hispanic or latino	309 (95.96)	215 (95.56)	94 (96.91)	
Disease category (n, %)				0.1397
Relapsing-remitting MS	258 (80.37)	187 (83.48)	71 (73.20)	
Primary progressive MS	13 (4.05)	6 (2.68)	7 (7.22)	
Secondary progressive MS	34 (10.59)	22 (9.82)	12 (12.37)	
Progressive relapsing MS	3 (0.93)	2 (0.89)	1 (1.03)	
Clinically isolated syndrome	13 (4.05)	7 (3.13)	6 (6.19)	
Disease duration (years, (SD))	14.53 (7.70)	14.74 (7.62)	14.03 (7.90)	0.4511
EDSS (median, (IQR))	1.5 (1.5)	1.5 (1.5)	1.5 (1.5)	0.8369

Legend: EDSS: Expanded Disability Status Scale

†p-values were calculated via t-test (continuous variables) and Fisher's exact test (categorical variables) to compare the values between women and men. Legend: EDSS: Expanded Disability Status Scale

Measures

- Medical Outcomes Survey Short Form 36 (SF-36): a generic, health-related quality of life (HRQOL) instrument that provides mental component (MCS) and physical component (PCS) summary scores
- Center for Epidemiological Studies Depression Rating Scale (CES-D): focuses on the cognitive and affective aspects of depression
- Modified Fatigue Impact Scale (MFIS): measures the physical, cognitive, and psychosocial aspects of fatigue
- State-Trait Anxiety Inventory (STAI): assesses current condition of "state anxiety" and more general and longstanding condition of "trait anxiety"
- MOS Modified Social Support Survey (MSSS): assesses various dimensions of social support including emotional/informational, tangible, affectionate, and positive social interaction

Statistics

- Multiple linear regression was used to compare the genders in terms of mean PRO scores and to assess the interaction between gender and disability level on mean PRO scores.
- All analyses controlled for age.

Results

- Men and women within the cohort were similar in terms of demographic and baseline clinical characteristics (p>0.1 for each comparison). No significant difference between the genders was observed for any of the summary scores (p>0.05), but women generally had scores indicating better functioning.
- Mean scores in both groups showed subjects had limited impairment on any of the PROs.
- A significant interaction was found only in the analysis of the MFIS. Men and women had similar fatigue at the low EDSS level, but men had greater fatigue at the high EDSS level.
- For all scales, with the exception of the MSSS, the low EDSS category saw the smallest difference between genders and the high EDSS category saw the largest difference, with women having better HRQOL, although these differences did not reach significance.

Table 2. Cohort gender and disability characteristics

EDSS level	Men, n	Mean (SD) age - Men	Women, n	Mean (SD) age - Women
<3.0	75	46.46 (11.06)	174	46.12 (10..70)
3.0 - 5.5	13	52.39 (11.07)	25	49.23 (12.95)
>=6.0	9	52.09 (10.19)	26	55.17 (9.21)

Figure 1: Gender comparison across three disability levels: MFIS

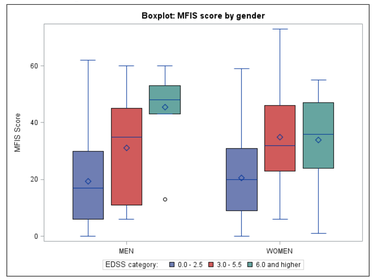
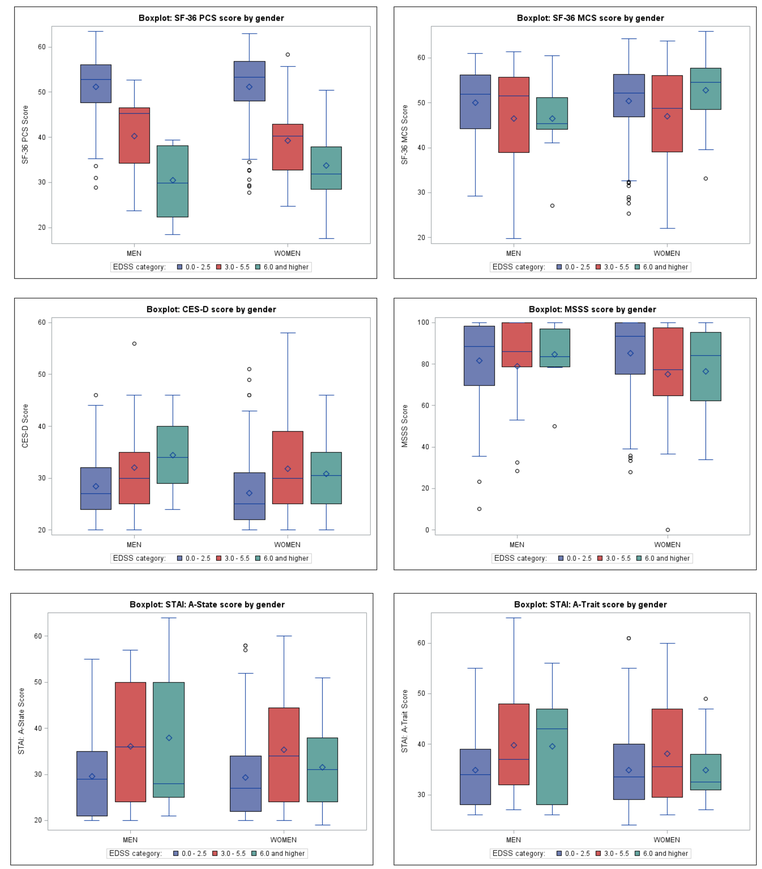


Table 3. Patient Reported Outcomes

Score	EDSS level	Men	Women	Interaction p-value
SF-36: PCS (mean, (SD))	<3.0	51.18 (7.29)	51.16 (7.60)	Reference group
	3.0 - 5.5	40.24 (9.92)	39.30 (8.57)	0.7562
	>=6.0	30.48 (8.17)	33.70 (8.94)	0.319
SF-36: MCS (mean, (SD))	<3.0	50.04 (7.74)	50.45 (7.83)	Reference group
	3.0 - 5.5	46.46 (13.35)	47.00 (11.42)	0.8986
	>=6.0	46.44 (9.43)	52.84 (7.84)	0.1029
CES-D (mean, (SD))	<3.0	28.44 (6.20)	27.14 (6.44)	Reference group
	3.0 - 5.5	32.08 (10.63)	31.80 (9.62)	0.7542
	>=6.0	34.44 (7.57)	30.85 (7.28)	0.4782
MFIS (mean, (SD))	<3.0	19.39 (15.24)	20.47 (14.14)	Reference group
	3.0 - 5.5	31.15 (18.87)	34.96 (16.93)	0.6234
	>=6.0	45.56 (13.57)	33.88 (16.05)	0.0396
MSSS (mean, (SD))	<3.0	81.72 (20.03)	85.31 (17.95)	Reference group
	3.0 - 5.5	79.07 (25.11)	75.10 (23.98)	0.3021
	>=6.0	84.64 (15.75)	76.57 (21.71)	0.1443
STAI: A-Trait (mean, (SD))	<3.0	34.91 (7.30)	34.92 (7.32)	Reference group
	3.0 - 5.5	39.77 (11.14)	38.08 (10.23)	0.4865
	>=6.0	39.55 (11.80)	34.92 (6.30)	0.1778
STAI: A-State (mean, (SD))	<3.0	29.64 (9.34)	29.38 (8.94)	Reference group
	3.0 - 5.5	36.07 (13.47)	35.33 (12.25)	0.8294
	>=6.0	38.00 (16.85)	31.54 (9.89)	0.1463

Figure 2: Gender comparison across three disability levels: SF-36, CES-D, MSSS, STAI



Conclusions

- Based on our sample, men and women were generally similar in terms of PROs.
- Limitations to this analysis included the overall low level of disability (median EDSS=1.5) and the underrepresentation of men (women n=225, men n=97) in the cohort.
- Future work in larger samples will be required to further investigate the impact of gender and disability on HRQOL.

References

1. Casetta, I., Riise, T., Wamme Nortvedt, M., Economou, N. T., De Gennaro, R., Fazio, P., . . . Granieri, E. (2009). Gender differences in health-related quality of life in multiple sclerosis. *Mult Scler, 15*(11), 1339-1346. doi: 10.1177/1352458509107016
2. Miller, A., & Dishon, S. (2006). Health-related quality of life in multiple sclerosis: The impact of disability, gender and employment status. *Qual Life Res, 15*(2), 259-271. doi: 10.1007/s11136-005-0891-6

Disclosures: Ms. LaRussa, Ms. Stuart, Ms. Leclaire, Ms. Cook, and Dr. Glanz receive research support from Merck Serono and Google Life Sciences. Dr. Healy receives research support from Merck Serono, Novartis, Genzyme, and Google Life Sciences and consulting fees from Biogen Idec. Dr. Houtchens receives consulting fees from Novartis, Teva Neuroscience, and Biogen, and consulting fees and research support from Sanofi Aventis. Ms. Chua, Dr. Bove, Dr. Chitnis, and Dr. Weiner report no disclosures.