Brief Report

Sexual Function, Satisfaction, and Use of Aids for Sexual Activity in Middle-Aged Adults with Long-Term Physical Disability

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Background: Sexuality is an important aspect of quality of life in individuals with disabilities, yet little is known about what factors contribute to sexual satisfaction as these individuals age. **Method:** Middle-aged adults with physical disabilities completed a cross-sectional survey that included measures of sexual activity, function, and satisfaction. **Results:** Consistent with studies of able-bodied adults, sexual function was the strongest predictor of satisfaction. However, depression also predicted sexual satisfaction for women. Use of aids for sexual activity varied by disability type and was generally associated with better function. Lowest levels of sexual satisfaction were reported by men with SCI. **Conclusion:** Depression may negatively impact sexual satisfaction in women, beyond contributions of sexual dysfunction, and effective use of sexual aids may improve function in this population. **Key words:** *muscular dystrophy, post-polio syndrome, sexual dysfunction, spinal cord injury*

For men and women in the general population, the prevalence of sexual dysfunction increases with age and has been shown to detract from quality of life.[1-6] Although sexuality is an important aspect of quality of life regardless of physical disability, only a handful of studies have described sexuality in persons with long-term physical disabilities (LTPD),[7,8] and virtually none have examined the intersection of disability, age, and gender in reporting of sexual outcomes.[3,4,9]

This study sought to (a) examine the prevalence of reported sexual dysfunction and rates of sexual aid use among individuals with LTPD; (b) examine the associations between sexual satisfaction, dysfunction, and the use of aids; and (c) evaluate physical and psychological predictors of sexual satisfaction separately for men and women living with LTPD. Based on literature from able-bodied samples, we hypothesized that sexual functioning would be the strongest predictor of sexual satisfaction. However, we made no a priori hypotheses regarding other predictors of satisfaction or the relationship of satisfaction to use of sexual aids.

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Methods

Procedures

Data were collected as part of a longitudinal survey studying secondary conditions in adults with physical disabilities, and methods for data collection have been described elsewhere.[10,11] Analyses in this article were based on data from the third year of this study, which focused on individuals in mid-life. Eligible individuals were 46 to 67 years old, reported a physician's diagnosis of muscular dystrophy (MD), spinal cord injury (SCI), or post-polio syndrome (PPS), and were able to read and understand English. A total of 641 surveys were mailed, and 576 were returned with complete data. Of these, 368 (64%) reported being in a relationship that involved sexual activity and were included in the present analyses. All procedures were approved by the institutional review board at the University of Washington.

Measures

Sexual function, sexual satisfaction, and use of aids for sexual activity were measured using

Top Spinal Cord Inj Rehabil 2015;21(3):227–232

www.thomasland.com

doi: 10.1310/sci2103-227

items taken from the Patient Reported Outcomes Measurement Information System's (PROMIS) sexual function item bank.[12] Using 5- or 6-point anchored scales, participants described their (a) satisfaction with their sex life, (b) ability to have a satisfying orgasm, and (c) ability to get and maintain an erection (men) or become lubricated during sex (women). Items also assessed use of aids to sexual functioning, including erectogenic medication, vacuum pump devices, personal lubricants, and hormones for sexual activity.[12,13] All items referred to the previous 30 days.

Symptom severity and the presence of health conditions were assessed as follows: (a) depressive symptoms (Patient Health Questionnaire–9 [PHQ-9])[14,15]; (b) pain interference (PROMIS Pain Interference – Short Form)[16,17]; (c) fatigue and anxiety (PROMIS items from the Profile-29 measure)[17,18,19,20]; and (d) spasticity and lower extremity weakness (measured on a 5-point scale ranging from *not at all* to *very much*). Mobility was measured with the 6-point Gross Motor Function Classification System (0 = *I have no mobility limitations* to 5 = *severely limited self-mobility even with the use of assistive technology*).[21]

Analyses

We first described the sample by rates of satisfaction, dysfunction, and aid use and determined whether these differed by diagnostic group via between-group chi-square analyses (categorical variables) or independent samples *t* tests (continuous variables). Relationships among sexual satisfaction, sexual dysfunction, and aid use were established via Pearson correlations. For men, we compared satisfaction with ability to get and maintain an erection, ability to have a satisfying orgasm, and use of erectogenic pills, penis pump, injection, and personal lubricants. For women, we compared satisfaction with lubrication difficulty, ability to have a satisfying orgasm, and use of vaginal moisturizers, hormones, and personal lubricants.

We identified secondary conditions associated with satisfaction. As an initial screen, we computed zero order Pearson's correlation coefficients to determine which predictors should be included for testing in multiple regression. The following predictors were significantly ($P < .05$) associated with sexual satisfaction: anxiety, pain, depression, and spasticity. We confirmed that no continuous measures showed significant skewness or heteroskedasticity, then we ran 2 linear regression models to determine the contribution of these predictors to satisfaction separately in men and women, controlling for sexual dysfunction, diagnostic group, and mobility.

Results

Demographics

The mean age for the sample was 58.7 years ($SD = 5.8$). Fifty-five percent of participants were male ($n = 120$) and 45% were female ($n = 98$). Participants were asked if they had a physician-confirmed diagnosis. Thirty-two percent of participants had an SCI, 38% had MD, and 30% had PPS. Most identified as non-Hispanic White ($n = 205$; 94%) and reported receiving at least a college degree ($n = 142$; 65%). Of the total sample, 218 individuals (37.8%) reported engaging in sexual activity in the past 30 days.

Use of sexual aids, dysfunction, and satisfaction

Prevalence statistics are presented in **Table 1**. The most commonly used aid was personal lubricant; the least frequently reported aids were vacuum pumps or erectogenic injections (with only individuals with SCI reporting using a pump). Individuals with SCI (particularly men) reported the lowest levels of satisfaction. However, participants with SCI also reported generally better sexual function than any other group, including better ability to have a satisfying orgasm and fewer difficulties with lubrication during activity (women). Notably, 17% of men with SCI reported that they "had not tried" to achieve an erection in the past 30 days, compared to 0% of men with PPS or MD.

Correlations among aid use, dysfunction, and satisfaction

For men and women, sexual satisfaction was most strongly associated with sexual function. Significant correlates of satisfaction included ability to have a satisfying orgasm ($r = 0.61$),

Table 1. Sexual activity and aid use in 3 populations with disabilities

	Spinal cord injury *n* (%)	Post-polio syndrome *n* (%)	Muscular dystrophy *n* (%)
In a relationship that involves sexual activity	131 (58)	105 (62)	132 (78)[a]
Engaged in sexual activity in past 30 days	69 (54)	65 (63)	84 (66)
Use of sexual aids at least once in past 30 days			
Hormones, women only	2 (10)[b]	19 (48)[a,c]	7 (18)[b]
Vaginal moisturizer, women only	3 (5)[b,c]	23 (58)[a]	22 (59)[a]
Pills, men only	14 (28)	7 (29)	13 (29)
Injection, men only	2 (4)	0	2 (4)
Penis pump, men only	3 (6)	0	0
Personal lubricant	30 (43)[b]	43 (67)[a]	48 (59)
Satisfaction with sex life in the past 30 days			
Not at all	11 (16)	7 (11)	8 (10)
A little bit	14 (20)	5 (8)	12 (15)
Somewhat	21 (30)	21 (32)	25 (30)
Quite a bit	12 (17)[b,c]	22 (34)[a]	31 (38)[a]
Very much	12 (17)	10 (15)	7 (8)
Difficulty to become lubricated during sexual activity, women only			
Extremely difficult or impossible	1 (6)	6 (16)	7 (19)
Very difficult or difficult	4 (24)	18 (47)	10 (28)
Slightly difficult	2 (12)	8 (21)	13 (36)
Not difficult	10 (59)[b,c]	6 (16)[a]	6 (17)[a]
Ability to get and keep an erection, men only			
Have not tried	8 (17)[b,c]	0[a]	0[a]
Excellent or very good	10 (21)	11 (46)	15 (33)
Good	10 (21)	7 (29)	14 (31)
Fair	8 (17)	4 (17)	8 (18)
Poor	12 (25)	2 (8)	8 (18)
Ability to have a satisfying orgasm			
Have not tried	5 (8)	2 (3)	2 (2)
Excellent or very good	37 (55)[b,c]	20 (32)[a]	23 (28)[a]
Good	6 (9)[b,c]	13 (21)[a]	22 (27)[a]
Fair	11 (16)	14 (22)	18 (22)
Poor	8 (12)	14 (22)	18 (22)

[a]Significant difference with SCI. [b]Significant difference with PPS. [c]Significant difference with MD.

erectile function (r = 0.56), quality of erection (r = 0.44), and ability to lubricate (r = 0.36). There were significant associations between function and aid use, such that men who reported good erectile function were more likely to use personal lubricants (r = 0.30) and those who reported using personal lubricants were more likely to report use of erectogenic aids (r = 0.23). For women, difficulty with lubrication was associated with use of vaginal moisturizers (r = -0.44). Results on aid use suggest that for men, use of erectogenic medication was negatively associated with satisfaction (r = -0.20). No aid for sexual activity was associated with satisfaction for women.

Regression model examining predictors of satisfaction

Regression results examining predictors of sexual satisfaction are presented in **Table 2**. For men and women, sexual dysfunction remained a strong predictor of satisfaction (P < .001),

Table 2. Predictors of sexual satisfaction in men and women with MD, PPS, and SCI

Step and variable	Adjusted R^2	R^2 change	F - $R^2\Delta$	β	*t*	*P*
Men						
Step 1: Control	0.02	0.04	1.69			.17
Diagnostic group PPS, yes/no				0.09	0.88	.38
Diagnostic group SCI, yes/no				-0.07	-0.55	.58
Mobility				-0.14	-1.29	.20
Step 2: Sexual function	0.33	0.32	17.90			.00***
Ability to get and keep an erection				0.24	1.89	.06
Ability to have a satisfying orgasm				0.36	3.06	.00**
Quality of erections				0.10	0.87	.39
Step 3: Secondary conditions	0.43	0.06	2.65			.04*
Pain				-0.15	-1.61	.11
Depression				-0.19	-1.59	.12
Anxiety				0.05	0.39	.70
Spasticity				-0.04	-0.48	.63
Women						
Step 1: Control	-0.02	0.02	0.55			.65
Diagnostic group PPS, yes/no				0.10	0.78	.44
Diagnostic group SCI, yes/no				0.16	1.19	.24
Mobility				-0.13	-1.02	.31
Step 2: Sexual function	0.50	0.51	46.24			.00***
Ability to become lubricated				0.20	2.42	.02*
Ability to have a satisfying orgasm				0.65	8.42	.00***
Step 3: Secondary conditions	0.55	0.06	3.18			.02*
Pain				0.11	1.21	.23
Depression				-0.28	-2.67	.01**
Anxiety				-0.04	-0.34	.74
Spasticity				-0.04	-0.54	.59

Note: MD = muscular dystrophy; PPS = post-polio syndrome; SCI = spinal cord injury.
*$P < .05$. **$P < .01$. ***$P < .001$.

beyond any effects of disability type or mobility impairment. For women, depression was also a significant predictor, after controlling for the effects of sexual function ($P < .01$).

Discussion

Sexuality is an important component of quality of life for all individuals, regardless of age or physical ability.[6,22] However, this preliminary study is one of the first to look at sexual function, satisfaction, and aid use in middle-aged individuals with physical disability. Our data emphasize the importance of sexual activity for people with disabilities, with 38% of our sample reporting sexual activity in the past 30 days. Although this is somewhat lower than other reported samples of able-bodied middle-aged adults,[23,24] sexuality is clearly an important issue for adults with LTPD.

The majority of our sample described themselves as being "somewhat" or "quite a bit" satisfied, which is consistent with samples of able-bodied middle-aged individuals.[25-27] Reported rates of sexual dysfunction, particularly erectile and lubrication difficulty, appear to be greater in our sample when compared to data of individuals without physical disability.[25,27]

Fortunately, there is evidence from these data that many individuals with disability and sexual dysfunction are willing to experiment with aids

for sexual activity. The majority (65%) of our sample reported using at least one aid for sexual functioning, and more than half used personal lubricants for sexual activity.

There was also evidence that sexual satisfaction, function, and aid use varied by diagnosis. Individuals with SCI reported the lowest rates of satisfaction, with only one-third indicating that they were "quite a bit" or "very much" satisfied with their sexual activity. This was true despite higher rates of ability to orgasm and lower rates of lubrication difficulties. This finding may be driven primarily by males with SCI, who generally reported more frequent erectile difficulties than did PPS or MD participants and were less likely to try to achieve an erection at all. It is perhaps unfortunate that only 6% reported experimenting with a vacuum erection device (penis pump), given that the device is generally safe and has high rates of satisfaction among men with SCI.[28]

Consistent with data from able-bodied populations, sexual functioning was the most significant predictor of sexual satisfaction in our sample, for both men and women. Overall, secondary conditions did not have a strong significant effect on the prediction of satisfaction after controlling for the effects of diagnosis, sexual dysfunction, and mobility limitation. There was one exception for women, where depression remained a unique predictor of sexual satisfaction after inclusion of controls. This finding is perhaps not surprising given that mood is directly related to libido[29,30] and that some antidepressants (and particularly the selective serotonin reuptake inhibitor [SSRI] class) may be associated with anorgasmia and less vaginal lubrication.[31,32]

Our results are limited by the cross-sectional self-report design and absence of partner interview. However, these initial findings emphasize the importance of sexual activity in adults aging with physical disability, especially for those aging with SCI. Clinicians should address challenges with sexual expression openly and discuss options to restore or improve function with patients and their partners. Factors such as depression may have a deleterious effect on sexual satisfaction and quality of life and should remain a target for assessment and intervention.

Acknowledgments

The authors declare no conflicts of interest.

The contents of this publication were funded by the Department of Health & Human Services, Administration for Community Living, the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR), grant numbers H133B080024, H133B130018, and 90RT5023-01-00. However, those contents do not necessarily represent the policy of the Department of Health & Human Services, and endorsement by the Federal Government should not be assumed.

REFERENCES

1. Araujo AB, Mohr BA, McKinlay JB. Changes in sexual function in middle-aged and older men: Longitudinal data from the Massachusetts Male Aging Study. *J Am Geriatr Soc.* 2004;52(9):1502-1509.
2. Bancroft JH. Sex and aging. *N Engl J Med.* 2007;357(8):820-822.
3. Yilmaz H, Polat HAD, Yilmaz SD, et al. Evaluation of sexual dysfunction in women with rheumatoid arthritis: A controlled study. *J Sex Med.* 2012;9(10):2664-2670.
4. Charlifue SW, Gerhart KA, Menter RR, Whiteneck GG, Manley MS. Sexual issues of women with spinal cord injuries. *Paraplegia.* 1992;30(3):192-199.
5. Syme ML, Klonoff EA, Macera CA, Brodine SK. Predicting sexual decline and dissatisfaction among older adults: The role of partnered and individual physical and mental health factors. *J Gerontol Ser B: Psychol Sci Social Sci.* 2012;68(3):323-332.
6. Robinson JG, Molzahn AE. Sexuality and quality of life. *J Gerontol Nurs.* 2007;33(3):19-27; quiz 38-19.
7. Watanabe T, Chancellor MB, Rivas DA, et al. Epidemiology of current treatment for sexual dysfunction in spinal cord injured men in the USA model spinal cord injury centers. *J Spinal Cord Med.* 1996;19(3):186-189.
8. Lew-Starowicz M, Rola R. Sexual dysfunctions and sexual quality of life in men with multiple sclerosis. *J Sex Med.* 2014;11(5):1294-1301.
9. McCabe MP, Taleporos G. Sexual esteem, sexual satisfaction, and sexual behavior among people with physical disability. *Arch Sex Behav.* 2003;32(4):359-369.
10. Alschuler KN, Gibbons LE, Rosenberg DE, et al. Body mass index and waist circumference in persons aging with muscular dystrophy, multiple sclerosis, post-polio syndrome, and spinal cord injury. *Disabil Health J.* 2012;5(3):177-184.

11. Jensen MP, Smith AE, Bombardier CH, Yorkston KM, Miro J, Molton IR. Social support, depression, and physical disability: Age and diagnostic group effects. *Disabil Health J.* 2014;7(2):164-172.
12. Flynn KE, Lin L, Cyranowski JM, et al. Development of the NIH PROMIS sexual function and satisfaction measures in patients with cancer. *J Sex Med.* 2013;10:43-52.
13. Flynn KE, Reeve BB, Lin L, Cyranowski JM, Bruner DW, Weinfurt KP. Construct validity of the PROMIS sexual function and satisfaction measures in patients with cancer. *Health Qual Life Outcomes.* 2013;11(1):40.
14. Fann JR, Bombardier CH, Dikmen S, et al. Validity of the Patient Health Questionnaire-9 in assessing depression following traumatic brain injury. *J Head Trauma Rehabil.* 2005;20(6):501-511.
15. Bombardier CH, Richards JS, Krause JS, Tulsky D, Tate DG. Symptoms of major depression in people with spinal cord injury: Implications for screening. *Arch Phys Med Rehabil.* 2004;85(11):1749-1756.
16. Amtmann D, Cook KF, Jensen MP, et al. Development of a PROMIS item bank to measure pain interference. *Pain.* 2010;150(1):173-182.
17. Cook KF, Bamer AM, Amtmann D, Molton IR, Jensen MP. Six patient-reported outcome measurement information system short form measures have negligible age- or diagnosis-related differential item functioning in individuals with disabilities. *Arch Phys Med Rehabil.* 2012;93(7):1289-1291.
18. Cook KF, Bamer AM, Roddey TS, Kraft GH, Kim J, Amtmann D. A PROMIS fatigue short form for use by individuals who have multiple sclerosis. *Qual Life Res.* 2012;21(6):1021-1030.
19. Senders A, Hanes D, Bourdette D, Whitham R, Shinto L. Reducing survey burden: Feasibility and validity of PROMIS measures in multiple sclerosis. *Mult Scler.* 2014;20(8):1102-1111.
20. Pilkonis PA, Choi SW, Reise SP, Stover AM, Riley WT, Cella D. Item banks for measuring emotional distress from the Patient-Reported Outcomes Measurement Information System (PROMIS): Depression, anxiety, and anger. *Assessment.* 2011;18(3):263-283.
21. Palisano R, Rosenbaum P, Walter S, Russell D, Wood E, Galuppi B. Development and reliability of a system to classify gross motor function in children with cerebral palsy. *Dev Med Child Neurol.* 1997;39(4):214-223.
22. Shamspour N, Assari S, Moghana Lankarani M. Relation between sexuality and health-related quality of life. In: Preedy V, Watson R, eds. *Handbook of Disease Burdens and Quality of Life Measures.* New York: Springer; 2010:3457-3473.
23. Lindau ST, Schumm LP, Laumann EO, Levinson W, O'Muircheartaigh CA, Waite LJ. A study of sexuality and health among older adults in the United States. *N Engl J Med.* 2007;357(8):762-774.
24. Spatz ES, Canavan ME, Desai MM, Krumholz HM, Lindau ST. Sexual activity and function among middle-aged and older men and women with hypertension. *J Hypertens.* 2013;31(6):1096-1105.
25. Laumann EO, Glasser DB, Neves RC, Moreira ED Jr. A population-based survey of sexual activity, sexual problems and associated help-seeking behavior patterns in mature adults in the United States of America. *Int J Impot Res.* 2009;21(3):171-178.
26. Laumann EO, Paik A, Glasser DB, et al. A cross-national study of subjective sexual well-being among older women and men: Findings from the global study of sexual attitudes and behaviors. *Arch Sex Behav.* 2006;35(2):145-161.
27. Laumann EO, Waite LJ. Sexual dysfunction among older adults: Prevalence and risk factors from a nationally representative U.S. probability sample of men and women 57-85 years of age. *J Sex Med.* 2008;5(10):2300-2311.
28. Denil J, Ohl DA, Smythe C. Vacuum erection device in spinal cord injured men: Patient and partner satisfaction. *Arch Phys Med Rehabil.* 1996;77(8):750-753.
29. Phillips RL Jr, Slaughter JR. Depression and sexual desire. *Am Family Phys.* 2000;62(4):782-786.
30. Segraves RT. Psychiatric illness and sexual function. *Int J Impot Res.* 1998;10(suppl 2):S131-133; discussion S138-140.
31. Clayton AH, Montejo AL. Major depressive disorder, antidepressants, and sexual dysfunction. *J Clin Psychiatry.* 2006;67(suppl 6):33-37.
32. Clayton AH, Pradko JF, Croft HA, et al. Prevalence of sexual dysfunction among newer antidepressants. *J Clin Psychiatry.* 2002;63(4):357-366.