Disease-Afflicted Older Adults: Can Marital Quality Help or Hinder Their Sexual Frequency?

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ABSTRACT

I work from a stress-buffering perspective to examine how marital quality is related to the sexual frequency of partnered older adults who are afflicted with one or more chronic diseases. I use data from the first two waves of the National Social Life, Health, and Aging Project (N=1,012) to run regression models with lagged dependent variables. Among older adults with chronic disease, an increase in positive marital quality over time, as well as higher positive marital quality at baseline for men, is related to higher sexual frequency five years later. Additionally, an increase in older adults' negative marital quality, as well as a higher baseline level of negative marital quality for men, is related to lower sexual frequency five years later. By analyzing a unique, unhealthy sample, the results demonstrate that marital quality may be one way that disease-afflicted adults can protect their sexual activity in later life.

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The population of older adults in the United States is projected to continue growing in future decades (Centers for Disease Control and Prevention, 2013). This burgeoning age group has attracted much research focus as scholars consider the implications of increased longevity on multiple domains of life. One historically understudied dimension of older adults' lives which is garnering more attention is sexuality. Part of the research on older adults' sexuality concentrates on how the increased incidence of chronic disease in this population coincides with sexual dysfunctions and cessation (Verschuren, Enzlin, Dijkstra, Geertzen, and Dekker 2010). However, less research explores how psychosocial factors such as marital quality may help or hinder disease-afflicted older adults' sexual experiences.

This study examines how positive and negative dimensions of the marital relationship are related to the sexual frequency of older adults in heterosexual relationships who have been diagnosed with one or more chronic diseases. Over 90% of adults age 65 and older have at least one chronic condition (Akinyemiju, Jha, Moore, & Pisu, 2016). The presence of one or more chronic diseases in later life can disrupt sexual activity (Schover and Jensen 1988). Chronic diseases can also result in increased dependency on others for help and management (Berg and Upchurch 2007) and be a source of stress (Maes, Leventhal, and DeRidder 1996). Marital quality is a route by which disease-burdened individuals can buffer the stressor of disease and avoid a decline in their sexual activity (Schnarch 1991). Drawing upon the stress-buffering theory, this paper investigates the following research questions: 1) how does marital quality affect the sexual frequency of older adults after the onset of chronic disease, and 2) is there a gender difference in this relationship?

The importance of this study is highlighted by the multiple benefits that sex in later life brings. Sex is an integral aspect of a relationship, and culturally, sex is seen to foster happiness and longevity (Fisher 2010; Lodge and Umberson 2012). Older adults identify sex to be tied to well-being and quality of life (Berdychevsky and Nimrod 2017; Syme 2014). Sexual activities can increase mood and decrease stress (Brody 2010). Although chronic diseases can disrupt sexuality in older adults, good marital quality has the potential to play a role in protecting sexuality among unhealthy individuals in later life.

Health and Older Adults' Sexuality

Being in good health is important for older adults' continued sexual behavior while being unhealthy can be detrimental to sexuality. Individuals who are in poor health have a greater likelihood of experiencing a sexual problem or lower sex frequency, and poor health is a contributing factor to marriages void of sexual activity (Call, Sprecher, and Schwartz 1995; Donnelly 1993; Laumann, Gagnon, Michael, and Michaels 1994). Chronic conditions, such as cardiovascular disease, diabetes, obesity, and hypertension, are linked to older adults' sexual problems and lower sexual activity (Camacho and Reyes-Ortiz 2005; DeLamater 2012; DeLamater and Karraker 2009). Additionally, patients with irregular thyroid activity, incontinence, asthma, or chronic obstructive pulmonary disease can also experience sexual dysfunctions from these conditions (Zeiss and Kasl-Godley 2001). Health problems, especially if they are chronic, affect both men and women as they try to engage in sexual activities (Call et al. 1995, Syme 2014). Older men and women still have the capacity for intercourse and orgasm, and many still desire it. The limiting factor for sex among this population is most often their physical health rather than their age (Waite et al. 2009).

Physical changes that naturally occur over the life course can impact sexuality (Levy 1994). For instance, when women experience menopause, estrogen declines and intercourse becomes uncomfortable because the vagina shrinks and makes penile insertion difficult (DeLamater and Friedrich 2002). However, this problem is not inevitable, as vaginal atrophy can be counteracted with regular coital activity (Levin 2007). As men age, their testosterone decreases which makes getting an erection more difficult (DeLamater and Karraker 2009). However, they can communicate this problem to their partner and try new methods or spend more time having sex to still maintain their sex lives (Zeiss & Kasl-Godley 2001). Thus, it is important to consider how other factors, such as relationship factors, play a role in the association between health and sexuality. This is because sexuality is determined not only by biological factors, but also by psychological and social factors (Lindau, Laumann, Levinson, and Waite 2003). For instance, after an individual has been diagnosed with a chronic disease, having a more positive marital relationship may help assuage health concerns and incorporate physical limitations so that there is not a decrease in sexual activity or functioning. In contrast, negative marital interactions may encourage a decrease in sexual activity and functioning after chronic disease onset. To explain the relationship between marital quality and sexuality, I work from a stress-buffering perspective.

Theoretical Approach: The Stress-Buffering Model

Chronic diseases progress slowly, require constant attention, and can rarely be cured (U.S. Department of Health and Human Services 2010). Having a chronic disease can be stressful in a variety of ways (Bisschop, Kriegsman, Beekman, and Deeg 2004) and having one or more chronic diseases is a source of stress (Jackson, Knight, and Rafferty 2010). When multiple events cause stress or if multiple stressful problems accumulate, serious complications

can occur (Cohen and Willis 1985). However, social relationships may play a role in managing—or enhancing—that stress. The stress-buffering model suggests that social support is protective for well-being when a person is stressed (Cohen and Willis 1985; Robles, Slatcher, Trombello, and McGinn 2014). This model incorporates an individual's perception of their stress and their support to influence their health (Cohen, Gottlieb, and Underwood 2000). The marital relationship is one of the most important social relationships which can provide either stress or support (Robles and Kiecolt-Glaser 2003; Umberson, Williams, Powers, Liu, and Needham 2006). As Galinsky and Waite (2013) suggest in their model, poor health can lead to stress which can lead to worse marital quality. However, positive marital quality, such as social support from a spouse, can help mediate the stress and buffer negative outcomes (Cohen and Willis 1985) while negative marital quality can be an additional stressor, compound the stress, and enhance problems (Robles and Kiecolt-Glaser 2003).

I extend this stress-buffering approach to sexuality, as stress often corresponds with sexual problems (Schnarch 1991). Both physical health conditions and relationship well-being can contribute to problems with sexual functioning (Laumann, Das, and Waite 2008). Negative marital quality is a source of strain and being stressed can have a negative impact on maintaining sexual activity (Laumann, Paik, and Rosen 1999; Laumann et al. 2008). However, couples who are more supportive of one another may be able to adapt to their stressors and avoid a decline in their marital sexuality and intimacy (Schnarch 1991). Thus, the stress-buffering model would suggest that among individuals who are afflicted with chronic disease, positive marital quality would help buffer the stress from being unhealthy so that sexual frequency continues, while negative marital quality would enhance that stress and lead to decreased sexual activity.

Marital Quality and Sexuality: Positive and Negative Dimensions

Marital quality can bring benefits for older adults, such as increased quality of life, life satisfaction, and happiness (Carr, Freedman, Cornman, and Schwarz 2014; Hinchliff, Tetley, Lee, and Nazroo 2018). Marital quality also affects sexual experiences (Verschuren et al. 2010), however there is little understanding of how marital quality is related to sexual activity. While it may be a logical assumption that good marital quality would be associated with a better sex life (Brubaker 1990), there is limited evidence on this topic. Research using a representative sample of older adults shows that their marital quality can be protected through sexual activity even when they or their partner are in declining health (Galinsky and Waite 2014), but there are no studies that examine how marital quality may protect sexual activity in unhealthy older populations. Instead, there has been some research done in more general populations to examine how positive and negative marital quality are related to sexual frequency.

Positive Marital Quality. Positive martial quality, which refers to "positive experiences such as feeling loved, cared for, and satisfied in the relationship" (Umberson and Williams 2005, p. S109), can help older adults to continue sexual activity (DeLamater 2012). Empirical evidence on how positive marital quality is related to sexual frequency is limited and largely comes from convenience samples. An analysis of a convenience sample of older couples found that better marital quality was correlated with greater sexual frequency and more interest in sex (Brubaker 1990). Another community sample of partnered, middle-aged women found an association between sex frequency and positive marital quality (Hawton, Gath, and Day 1994). In a convenience sample of married couples ages 56-92, better marital quality was correlated with more sexual interest, while worse marital quality was linked to lower sexual interest of older adults (Ade-Ridder 1990). Marital happiness has also been associated with sexuality. A cross-sectional sample of adults 19 and older found that people in marriages that were happier and

more satisfying had higher sexual frequency (Donnelly 1993). A representative study of older adults found that higher levels of marital happiness was associated with continued sexual activity (Karraker and DeLamater 2013). Further, a nationally representative survey of married adults 18 and older found that being satisfied in one's marriage was positively associated with frequency of marital sex (Call et al. 1995). These studies, while not focusing on unhealthy adults and how marital quality can buffer health stressors, demonstrate a positive pattern between marital quality and sexuality.

Although it is currently unclear how positive marital quality is related to sexuality for older individuals with a chronic disease, it is likely that the support from better marital quality would have a protective effect on sexuality. Research indicates that individuals have better marital adjustment when they feel that their spouse is supportive rather than controlling (Berg and Upchurch 2007). For instance, individuals who experience positive marital quality may receive more support from their spouse which can protect against other stressors, such as chronic diseases, and not harm their sex life (Donoho et al. 2013). As these studies demonstrate, positive feelings and emotions toward a spouse are beneficial for sex (DeLamater and Hyde 2004). Given this information, I predict that:

> *Hypothesis 1:* After chronic disease burden onset, people who have higher levels of positive marital quality will have higher sexual frequency than people who have lower levels of positive marital quality.

Negative Marital Quality. Similar to studies of positive marital quality, there is little research about how negative marital quality, defined as "negative experiences such as demands from one's spouse and marital conflict" (Umberson and Williams 2005, p. S109), is related to sexuality. Several studies using data from community and clinical samples find a link between

poor marital quality and sexual activity. A cross sectional study of adults who were 45 years old on average found that negative marital quality was associated with a decrease in sexual activity (Call et al. 1995). A longitudinal survey of partnered, middle aged women found that less spousal support was predictive of a later decline in desire to have sex (Hällström and Samuelsson 1990). A community sample of women saw a significant relationship between sexual dysfunction and negative marital quality (Osborn, Hawton, and Gath 1988), while another convenience sample found that, among middle-aged couples, those who struggled with low sexual desire had worse marital quality compared to those couples who did not have this problem (Trudel, Landry, and Larose 1997). One representative study of older adults found that being dissatisfied with their relationship with their partner was tied to older women's difficulty achieving orgasm and old men's greater disinterest in sex (Laumann et al. 2008). Finally, a clinical sample comparing diabetic and nondiabetic women found that problems with sexual functioning were related to poor marital quality regardless of diabetes status (Enzlin et al. 2002). These studies demonstrate that there is a relationship between marital quality and sexuality, and that this is even true among individuals with a chronic disease.

Worse marital quality in older adults' relationships is associated with the cessation of sexual behaviors (Karraker and DeLamater 2013). One characteristic of sexually inactive marriages is that spouses are unhappy with their marital relationships (Donnelly 1993). Still, there is no data on how this relationship occurs for a nationally representative sample of unhealthy, older adults. Drawing upon this information, I anticipate that:

> *Hypothesis 2:* After chronic disease burden onset, people who have higher levels of negative marital quality will have lower sexual frequency than people who have lower levels of negative marital quality.

Gender Differences. The limited empirical evidence on this topic does not leave much room for comparing men's and women's experiences with sexuality. However, previous research does show that experiences of marital quality vary by gender. First, women experience more distress from their marital relationship than men, as women are more aware of and sensitive to their marital quality and their spouse's experiences in the relationship (Berg and Upchurch 2007; Kiecolt-Glaser and Newton 2001; Liu and Waite 2014). Women can also spend more time reminiscing about marital disagreements which can arouse stress or leave them feeling depressed (Kiecolt-Glaser, Glaser, Cacioppo, and Malarkey 1998). Further, women's sexual desire is more sensitive to their relationship context, while men's desire is not as heavily linked to their relationship or even having a partner (DeLamater and Sill 2005). Still, men may report greater relationship satisfaction than women (Smith et al. 2011). So, women may be more reactive to their marital quality than men while men will report higher levels of marital quality than women.

As for sex, some women think that problems with engaging in and enjoying sex come from problems within their marriage (Hawton et al. 1994; Osborn 1988). One study of 45 couples, who on average were married for almost four decades, found that men's marital quality is correlated to their own sexual desire, while their wives' sexual desire does not affect their marital quality; however, women in this study were more attuned to their partner, as their husband's sexual desires were related to their marital quality even though their own desires were not (Brubaker 1990). Overall, marital quality is a stronger predictor of older women's sexual activity while physical health is more predictive of men's sexual activity (Dominguez and Barbagallo 2016). This evidence shows that while there is a link between marital quality and sexuality for both men and women, women's sexual lives may be more strongly linked to marital quality than men. Therefore, I form my final hypothesis:

Hypothesis 3: After chronic disease onset, the effect of marital quality on sexual frequency will be stronger for women than men.

DATA AND METHODS

I use data from Waves 1 and 2 of the National Social Life, Health, and Aging Project (NSHAP) to test my hypotheses. NSHAP data is nationally representative of U.S. community-residing adults who were 57-85 years at Wave 1. Respondent information was collected by the National Opinion Research Center (NORC) at the University of Chicago. Data collection included over sampling of men, African Americans and Latinos, and adults 75-84 years old (Waite, Laumann, Levinson, Lindau, & O'Muircheartaigh 2014). From 2005-2006, the first wave of NSHAP data was collected from a sample of 3,005 adults. The interviews took place in respondents' homes and included biomarker data collection and a leave behind questionnaire that respondents returned via mail (Waite, Laumann, et al. 2014). For the second wave of data, collected from 2010-2011, NSHAP re-interviewed 2,261 of the Wave 1 respondents and collected similar data using interviews, biomarker collections, and leave behind questionnaries (Waite, Cagney, et al. 2014).

Sample Selection. I restricted my analysis to the 1,250 respondents who were interviewed and who remained married or cohabiting in both waves. Married and cohabiting couples in later life are more similar compared to their younger cohorts and they are relatively similar in terms their appraisals of marital quality (Brown and Kawamura 2010; Lindau et al. 2010). For the sake of brevity, however, I refer to "husbands," "wives," and "marital quality" throughout the paper. Additionally, I focused on individuals who, at baseline, had at least one chronic disease. To identify which disease diagnoses qualified respondents to be in my analytic sample, I followed Vasilopoulos and colleagues' (2014) classification of chronic diseases in Wave 1 of NSHAP

which are most prevalent among older adults, which are associated with mortality and disability, and which have an impact on their overall health and aging. This included seven categories of conditions: cardiovascular, endocrine and metabolic, cancer, lung, inflammatory and bone, neurological, and sensorimotor conditions (Vasilopoulos et al. 2014). Diseases in each of these categories have been linked to poor sexual outcomes (Schover and Jensen 1988). Specifically, I included individuals who were diagnosed by a doctor (yes/no) with hypertension, heart attack, congestive heart failure, stroke, diabetes, skin cancer, non-skin cancer, metastatic cancer, chronic obstructive pulmonary disease, emphysema, asthma, arthritis, Alzheimer's disease, dementia, urinary incontinence, stool incontinence, or other urinary problems. If a respondent had one or more of these diseases at Wave 1, they were included in my sample. There were 146 men and women who reported never being diagnosed with any of these conditions by a doctor, and there were 8 respondents who were missing on all measures; these 154 respondents were excluded from the analysis sample. Further, I excluded cases with missing values on key measures including Wave 2 sexual frequency (N=27) and marital quality (N=57). The final analytic sample include 608 men and 404 women.

Measures

Sexual Frequency. Sexual frequency at Wave 2 was the key outcome measure. NSHAP gave the following definition of sex to respondents when asking sexuality-related questions: sex refers to "mutually voluntary activity with another person that involves sexual contact, whether or not intercourse or orgasm occurs" (Lindau et al., 2007, p. 763). Sexual frequency was the combination of two variables. First, NSHAP asked respondents whether they had sex in past three months (yes/no). NSHAP also asked respondents how frequently during the past twelve months respondents had sex with their partner (none, once a month, two to three times a month,

once a week or more). I combined these variables so that sexual frequency was a continuous measure reflecting frequency of sexual activity in the past year, ranging from none (0) to once a week or more (3).

Marital Quality. Marital quality was the key predictor variable, and it consisted of positive and negative aspects. Marriages can include high or low positive and negative aspects at the same time, so each of these aspects of marital quality should be examined separately (Kiecolt-Glaser and Newton 2001; Umberson et al. 2006). I followed previous research that used NSHAP data to create marital quality measures (Galinsky and Waite 2014; Liu and Waite 2014; Liu, Waite and Shen 2016; Warner and Kelley-Moore 2012; Waite, Iveniuk, Laumann, and McClintock 2015). There were eight measures used to form the two dimensions of marital quality, and they were recoded so that the response categories were consistent and in the same direction.

For item one, respondents were asked how close they felt their relationship was with their spouse, with response categories including not very or somewhat close (1), very close (2), and extremely close (3). For item two, respondents were asked how they would describe their marriage in terms of happiness, with categories collapsed to include unhappy (1), happy (2), and very happy (3). For item three, respondents were asked how emotionally satisfying they find their relationship with their spouse, with response categories collapsed to include not satisfied (1), satisfied (2), and very satisfied (3). For item four, respondents were asked if they spend their free time together or apart from their spouse, with responses reversed coded to be mostly apart (1), some together and some apart (2), and mostly together (3). For item five, respondents were asked how often they can open up to their spouse, with responses including never, hardy ever, or rarely (1), some of the time (2), and often (3). For item six, respondents were asked how often

they can rely on their spouse, with responses including never, hardy ever, or rarely (1), some of the time (2), and often (3). For item seven, respondents rated how often their spouse makes too many demands on them, with responses including never, hardy ever, or rarely (1), some of the time (2), and often (3). Finally, for item eight, respondents rated how often their spouse criticized them, with responses including never, hardy ever, or rarely (1), some of the time (2), and often (3).

I ran exploratory factor analysis using these eight measures which yielded two dimensions, positive and negative marital quality. Table 1 includes the factor loadings of each measure that are used to create factor scores for each of the continuous positive and negative marital quality variables.

Table 1. Factor Loadings for Positive and Negative Marital Quality

	Wave 1		Wave 2	
	Positive	Negative	Positive	Negative
How close do you feel is your relationship with spouse?	**0.58**	-0.10	**0.62**	-0.08
How would you describe your marriage in terms of happiness?	**0.58**	-0.14	**0.62**	-0.08
How emotionally satisfying do you find your relationship with spouse?	**0.63**	-0.07	**0.56**	-0.07
Do you and spouse spend free time together or apart?	**0.37**	-0.02	**0.45**	0.06
How often can you open up to spouse?	**0.60**	0.08	**0.62**	-0.02
How often can you rely on spouse?	**0.61**	0.09	**0.52**	0.00
How often does spouse make too many demands on you?	-0.01	**0.64**	0.08	**0.77**
How often does spouse criticize you?	0.03	**0.71**	-0.13	**0.51**

Additional Covariates. I controlled for a respondent's sexual frequency at Wave 1. This variable was coded using the same two variables as the Wave 2 measure, except that it included a missing category and was treated as a categorical variable to account for the missing group. The

response categories for sexual frequency a Wave 1 were never (reference), once a month, two to three times a month, once a week or more, and missing.

I included several sociodemographic covariates in my analyses, all measured at Wave 1, which relate to marital quality and sexuality. *Age* was a continuous measure which ranges from 57-85. I coded *race/ethnicity* into four categories: non-Hispanic white (reference), non-Hispanic black, Hispanic, and all others. The measure for *income* asked respondents to compare their income to other Americans. Response categories were coded into below average (reference), average, above average, and missing. Finally, *education* was a continuous measure ranging from having no high school degree (1) to having a college degree or higher (4). These covariates and my analyses are stratified by *gender*.

Analytic Approach

I used lagged dependent variables to analyze how, among individuals who have been diagnosed with at least one chronic disease, marital quality is related to sexual frequency. Specifically, I used Wave 1 marital quality, as well as the change in marital quality from Wave 1 to Wave 2 to predict Wave 2 sexual frequency, while controlling for Wave 1 sexual frequency and all other covariates. I ran separate analyses for men and women, with two models for each. In Model 1, I tested measures of positive marital quality. In Model 2, I tested measures of negative marital quality. All models are estimated using ordinary least squares (OLS) regression. I ran the models in Stata 11 (StataCorp, 2009), and all the analyses were weighted. I ran *t* tests to determine if there were statistically significant differences between men's and women's outcomes. Results for the *t* tests (shown in Appendix A3) indicated that gender differences in all findings were statistically significant.

Correction for Sample Selection

I restricted my sample to people who provided data in both waves, and I made some corrections to account for changes that would occur in the sample over the five-year period between data collections. I accounted for sample attrition that occurred from mortality by including a measure of the probability of dying between waves. I also included a measure that accounted for the probability that respondents would remain married or partnered across waves. These probability measures were developed by Heckman (1979); to help correct for selection bias, the measures estimated the probability that respondents would die or experience marital dissolution between Waves 1 and 2. These corrections have been calculated in previous studies using the first two waves of NSHAP data and included in their data analysis (Liu and Waite, 2014; Liu et al. 2016).

RESULTS

Descriptive Results

Table 2 depicts the weighted descriptive statistics for partnered men (N=642) and women (N=427). The *t* test results to determine if gender differences were statistically significant at or below the $p<0.05$ level are included with an indicator. From Table 2, it is evident that on average, men reported a significantly higher frequency of sex than women in Wave 2. Considering men's and women's sexual frequency at Wave 1, a significantly greater percent of women reported having no sex in the past year (33.56%) compared to men (22.89%), while a significantly greater percent of men reported having sex once a month in the past year (25.78%) compared to women (19.86%). There were no significant differences in the percentage of men and women reporting having sex 2-3 times a month or once a week or more in the past year.

In terms of marital quality, men report significantly higher scores of positive and negative marital quality at both Wave 1 and Wave 2 compared to women. There are only modest changes

in positive and negative marital quality between waves for men and women. For sociodemographic covariates, the average age of the sample is about 66 years old, with no significant difference between men and women. Men and women have similar education levels, with an average for both being between having a high school degree and having experienced some college education. A large majority of the sample are non-Hispanic white. A significantly greater percentage of women than men report having an average family income compared to other American families.

Table 2. Weighted Descriptive Statistics

	Men (N=642)			Women (N=427)		
	Mean(SD)/%	Min	Max	Mean(SD)/%	Min	Max
Sexuality						
W2 Sexual Frequency	1.10(1.11)†	0	3	0.94(1.11)†	0	3
W1 Sexual Frequency						
None (ref)	22.89†			33.56†		
Once a month	25.96			23.09		
2-3 times a month	22.47			20.02		
Once a week or more	25.78†			19.86†		
Missing	2.89			3.48		
Marital Quality						
W1 Positive MQ[1,2]	0.13 (0.80)†	-3.53	0.95	-0.09 (0.94)†	-3.75	0.95
W1 Negative MQ[1,2]	0.01 (0.80)†	-0.96	2.55	-0.13 (0.77)†	-0.92	2.52
W2 Positive MQ[3,4]	0.14 (0.79)†	-3.56	0.95	-0.09 (0.95)†	-3.56	0.95
W2 Negative MQ[3,4]	-0.01 (0.80)†	-0.81	2.59	-0.11 (0.76)†	-0.81	2.59
Covariates (all W1)						
Age	66.13 (7.20)	57	85	65.75 (6.47)	57	84
Education	2.86 (1.05)	1	4	2.77 (0.94)	1	4
Probability of Death	0.11 (0.08)†			0.06 (0.06)†		
Probability of Remaining	0.62 (0.19)†			0.43 (0.18)†		
Married						
Race						
Non-Hispanic White (ref)	83.68			86.79		
Non-Hispanic Black	6.69			6.73		
Hispanic	7.06			4.36		
Other	2.57			2.13		
Income						
Below Average (ref)	19.79			16.16		
Average	33.84†			40.90†		
Above Average	32.74			31.37		
Missing	13.62			11.57		

W1=Wave 1; W2=Wave 2. PMQ=Positive martial quality; NMQ=Negative marital quality.
[1]N=633 (men); [2]N=422 (women); [3]N=616 (men); [4]N=408 (women). †: t-tests significant at or below p=0.05.

Sexual Frequency

Table 3 shows the regression coefficients from ordinary least squares (OLS) regression models for sexual frequency at Wave 2 predicted by marital quality at Wave 1 and the change in marital quality from Wave 1 to Wave 2, separated by men and women. Model 1 includes both positive marital quality predictors and Model 2 includes both negative marital quality predictors. For men, results in Model 1 of Table 3 suggest that higher positive marital quality at baseline and an increase in positive marital quality between waves is significantly associated with a higher sexual frequency at Wave 2 (W1 PMQ β=0.20, $p<0.01$; PMQ W1-W2 β=0.17, $p<0.01$), when holding Wave 1 sexual frequency and all other covariates constant. The effect size of these two positive marital quality measures are similar to one another. Men's negative marital quality is also related to their sexual frequency. Model 2 of Table 3 indicates that higher negative marital quality at baseline and an increase in negative marital quality between waves is significantly associated with a lower sexual frequency at Wave 2 (W1 NMQ β=-0.17, $p<0.01$; NMQ W1-W2 β=-0.15, $p<0.05$), when controlling for Wave 1 sexual frequency and all other covariates. Again, these negative marital quality measures have similar effect sizes.

The results for women tell a slightly different story. For both positive and negative marital quality, only a change in marital quality between waves significantly predicts sexual frequency at Wave 2. Specifically, in Model 1 of Table 3, women who experience an increase in positive marital quality between waves have a significantly higher sexual frequency at Wave 2 (β=0.15, $p<0.01$), when holding Wave 1 sexual frequency and all other covariates constant. In Model 2 of Table 3, women who experience an increase in negative marital quality between waves have significantly lower sexual frequency at Wave 2 (β=-0.18, $p<0.01$), when controlling for Wave 1 sexual frequency and all other covariates.

Table 3-3. Regression Coefficients from OLS Regression Models of Marital Quality to Predict Sexual Frequency								
	Men (N=608)				Women (N=404)			
	Model 1		Model 2		Model 1		Model 2	
W1 PMQ	0.20**	(0.07)			0.08	(0.04)		
PMQ W2-W1	0.17**	(0.06)			0.15**	(0.05)		
W1 NMQ			-0.17**	(0.06)			-0.11	(0.06)
NMQ W2-W1			-0.15*	(0.07)			-0.18**	(0.06)
Constant	1.44	(1.10)	1.33	(1.09)	0.30	(0.83)	0.06	(0.83)
R-squared	0.334		0.330		0.516		0.517	
*** p<0.001, ** p<0.01, * p<0.05. Standard errors in parentheses. W1=Wave 1; W2=Wave 2. PMQ=Positive marital quality; NMQ=Negative marital quality. Models control for Wave 1 sex frequency, age, race, education, relative family income, probability of remaining married, and probability of death.								

DISCUSSION

Chronic diseases can add complications, challenges, and stressors to a marriage; these diseases may limit sexual activity in older age (Call et al. 1995; Donnelly 1993; Laumann et al. 1994). Marital quality may be one way to protect sexual activity, as it plays a role in both the health (Liu et al. 2016) and sexuality (Galinsky and Waite 2013) of partnered older adults. Positive marital quality may allow older adults with chronic conditions to buffer the stress that comes from being unhealthy and continue having sex (Cohen and Willis 1985; Donoho et al. 2013). This is because a more supportive partner, or positive interactions with one's partner, may help diseased individuals incorporate health and behavioral changes into their lives (Schnarch 1991). Thus, I predicted that among older adults diagnosed with chronic diseases, people who have higher levels of positive marital quality will have higher sexual frequency than people who have lower levels of positive marital quality (Hypothesis 1). At the same time, experiencing negative marital quality may exacerbate the stressors that accompany chronic diseases (Robles and Kiecolt-Glaser 2003). This could have a negative spillover into older adults' sex lives and result in a lower sexual frequency. So, I also predicted that among older adults diagnosed with

chronic diseases, people who have higher levels of negative marital quality will have lower sexual frequency than people who have lower levels of negative marital quality (Hypothesis 2). The results supported both of these hypotheses, as positive marital quality was associated with an increase in sexual frequency and negative marital quality was associated with a decrease in sexual frequency for older men and women.

More research focuses on marital quality as an outcome and how varying amounts of sexual activity are associated with it (Galinsky and Waite 2013; Syme 2014; Waite et al. 2017). There is less research on the opposite direction, and none that focuses on a population of older adults afflicted with a variety of chronic disease. The limited information on the link between marital quality and sexuality in more general populations supports the relationships I find using an afflicted older sample, namely that an increase in older adults' positive marital quality over time, as well as higher positive marital quality at baseline for men, is related to higher sexual frequency five years later and that an increase in older adults' negative marital quality, as well as a higher baseline level of negative marital quality for men, is related to lower sexual frequency five years later.

These results may be somewhat explained by additional sexual relationship factors which demonstrate how marital quality is important for sexuality in other ways. Good relationships with one's spouse can encourage feelings that indirectly benefit sexual activity. For older women especially, feeling sexually attractive and having a positive body image play an important role in fostering sexuality (Lodge and Umberson 2012; Syme 2014). Additionally, being interested in and desiring sex is an important factor in facilitating sexual activity, particularly for older women (DeLamater and Sill 2005, Kingsberg 2002). Moreover, being open with one's sexual partner about health problems and being able to incorporate changes to the sexual relationship

that come from these illnesses can lessen sexual activity interruptions (Lodge and Umberson 2012; Zeiss and Kasl-Godley 2001). Further, valuing sex as important is positively related to both older men's and women's sexual desire (DeLamater and Sill 2005), while being satisfied with one's relationship is associated with higher sexual frequency (DeLamater and Moorman 2007). It is possible that these various positive appraisals of one's relationship may be fostered by positive marital quality and facilitate more frequent sex in later life.

Although previous research has found that women are more attuned to their marital relationship, and it may have a stronger relationship to their health and well-being outcomes (Kiecolt-Glaser et al. 1997; Kiecolt-Glaser et al. 1998; Kiecolt-Glaser et al. 2005), I do not find that the relationship between marital quality and sexuality is stronger for unhealthy older women compared to unhealthy older men (Hypothesis 3). In fact, positive and negative marital quality are each tied to men's and women's sexual frequency with similar effect sizes across gender. The one gender difference in the results is that is it only a change in positive and negative marital quality that is important for influencing unhealthy older women's later sexual frequency; baseline measures of positive and negative marital quality were not significantly associated with women's later sexual frequency. This result is somewhat explained by literature that finds women are more in tune with their marital relationship and that it has a larger impact on them than men (Kiecolt-Glaser and Newton 2001). The finding that both baseline and change in marital quality are significant for predicting men's sexual frequency follows research that indicates more generally how better marital quality can encourage positive outcomes while worse martial quality can discourage them.

Moreover, the finding that women's marital quality at Wave 1 was not associated with their later sexual frequency is interesting because qualification for sample selection was that

women were diagnosed with one or more chronic diseases at Wave 1. The results indicate that over the five years, which is a significant amount of time for disease progression but also for patients to learn how to properly manage their diseases, a rise in positive marital quality and a fall in negative marital quality was related to an increase in sexual frequency. In line with the stress-buffering perspective, my results suggest that it is how sick women perceive their interactions with their spouse over time which is important in their later sexual frequency. Specifically, experiencing more positive marital quality where they feel close to their spouse and their spouse can be relied on that may strengthen their relationship with their partner and in turn have a significantly positive effect on their sexual frequency. The opposite is also true for negative marital quality, as it is women who are afflicted with chronic disease in old age and who perceive that their spouse becomes more critical or less reliable over time who experience a decrease in their sexual frequency. Donoho and colleagues' (2013) examination of inflammation markers for adults at midlife found that simply being married was beneficial for men's health, while women needed support and compassion from their partner to have marriage benefit their health. My results support a related pattern for sexual outcomes. Both measures of positive and negative marital quality are important for men's sexual activity, while for women, it is only experiencing an increase in positive marital quality and a decrease in negative marital quality over time that is related to an increase in their sexual frequency.

Contrary to cultural depictions of older adults, they are still having sex and continue to do so despite have chronic diseases. With increased longevity, the quality of life of older adults is a growing area of concern for researchers, policy makers, and health practitioners. Sexuality is one aspect of quality of life (Berdchevsky and Nimrod 2017; Fisher 2010), and older adults are curious about how these diseases and the medications prescribed for them will affect their sexual

lives (Steinke 1994). Much of the research on marital quality among older adults focuses on how it is linked to their physical and emotional health, finding that higher levels of marital quality are associated with better physical health outcome (Robles et al. 2014) and that worse negative marital quality is related to greater emotional distress (Carr, Cornman, and Freedman 2016). However, the current findings indicate that these associations can also be extended for older adults' sexual frequency and suggest that even in the face of disease, marital quality plays a significant role in their sexuality.

Limitations

My analysis of two waves of longitudinal data collected five years apart allow me to comment on how baseline as well as changes in positive and negative marital quality are associated with later sexual frequency. Still, there are some limitations to this study. First, while I test two waves of data, I cannot conclusively predict directionality. It is possible that there are bidirectional relationships among the key measures, as regular sexual activity is associated with healthy physical and mental outcomes (DeLamater 2012) and better marital quality (Galinsky and Waite 2014). A third wave of NSHAP data will soon be publicly available and allow me to better determine causal relationships. Second, as I control for the probability of dying between and remaining married between waves, the results apply to a select population and should be interpreted with caution. Third, it is possible that there is reporting error in the outcome measure because sexuality measures can be sensitive data to collect and research indicates that men tend to overreport their sexual activity and women tend to underreport it (Hyde et al. 2010). Fourth, I do not control for any medications respondents may be taking although with the sample selection, it is highly likely that all respondents are using prescription drugs. However, given the wide range of chronic diseases used to classify my analytic sample, there are too many

medication controls to include. In future studies, I intend to examine specific chronic conditions more closely, and when I focus on diseases that include drugs in their management plan which can have negative side effects on sexual functioning, such as cardiovascular diseases, I will control for medications. Finally, this study does not test specific strategies respondents use to manage their disease nor does it distinguish between sources of stress in older adults' lives. Still, the stress-buffering perspective would suggest that social relationships play a role and that more social support, i.e. from more positive marital quality, would help moderate the stressors that arise from disease (Cohen and Willis 1985). There is room for future studies to examine how the growing population of aging, disease-afflicted adults' sexuality is linked to their marital quality and other social relationships. This study begins the conversation by establishing the significant association between them.

Conclusion

This is the first nationally representative study that examines how experiences of positive and negative marital quality can help or hinder sexual frequency among older adults who have one or more chronic conditions. Marital support is an important resource for helping older adults adhere to complex health care routines (Berg and Upchurch 2007), but as my results show, it is also related to sexual frequency. The results are important because they suggest how social relationships can help older adults continue their sexual lives even while they face chronic health problems. This is a salient topic in developed countries, considering that the concurrent increase of chronic disease incidence in older adults and the advancement of medical treatment for chronic diseases results in an older adult population who still value sexuality but may experience more complications to it (Træen et al. 2017). Older adults who have one or more chronic

diseases but still want to continue having sex may focus on their relationship with their spouse as being either a resource that can help foster their sexuality or an added stressor which precludes it.

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