Gender Differences in Sexually Active Life Expectancy Over the Life Course

Gavrilova, N.G.[†], Lindau Stacy Tessler*
University of Chicago. Pritzker School of Medicine. Departments of OB/GYN*[†], Medicine (Geriatrics)*

We examined the association between self-reported health and measures of sexuality in middle-aged men and women. A first estimate of sexuality-related health expectancy is presented: sexually active life expectancy (SALE). We used health and sexuality data from the two major national surveys: National Survey of Midlife Development in the United States, MIDUS, (1995-1996), and the National Health, Social Life and Aging Project, NSHAP (2005-2006), to estimate association between self-reported health and measures of sexual activity and satisfaction. Significant gender disparities exist in SALE with women having less years spent in the state of sexual activity. These disparities increase with age. Role of physical health in maintaining sexual activity is apparently higher for men than women. Public health policy should be aware of this important aspect of quality of life and health at middle and older ages.

INTRODUCTION

Intimacy and sexuality comprise important, but frequently overlooked, aspects of health and quality of life (Satcher 2001). The medical model approach to understanding sexuality focuses on sexual dysfunction as a problematic consequence of aging, disease or treatment. Occasionally, medical texts suggest that patient complaints about sexual problems, particularly erectile difficulties, may herald serious underlying disease and ought not be ignored. While clinically valid, this narrow conceptualization of sexuality defies its multi-dimensional nature and limits understanding about the meaning of sexuality for health. A broader framework, as defined by the Interactive Biopsychosocial Model (Lindau, Laumann et al. 2003), conceptualizes the bidirectional relationship between sexuality and health. In this model, sexuality can be a consequence of or precursor to mental and physical illness. Additionally, health and sexual consequences of aging, illness or disease can be disadvantageous *or* advantageous.

As American society witnesses an unprecedented shift to older ages and a redistribution of illness from acute to chronic conditions, physicians are increasingly concerned with strategies for health maintenance and prevention of disease ((IOM) 1998; (IOM) 2001). Many clinic-based studies have established the negative effects of illness on sexual functioning (Rosen 1996; Korenman 1998; Bokhour, Clark et al. 2001; Andersen, Woods et al. 1997; Stead 2003; Stead 2004). On the other hand, ample data linking positive social relationships, particularly marriage, to health (Umberson 1992; Goldman, Korenman et al. 1995; Lillard and Waite 1995), suggest that positive sexual relationships may also be salubrious (Davey Smith, Frankel et al. 1997). Very little is known about relationship between global self-reported health and sexuality. Existing clinically-relevant data linking sexuality to health and well-being were usually conducted on small samples and could be not representative for the general population.

In this paper we analyze association of the global self-reported health and sexuality using two large population-based surveys: National Survey of Midlife Development in the United States, MIDUS, (1994-1995) and NSHAP. Both surveys included questions on sexual activity and sexual satisfaction in their questionnaires. While MIDUS study is focused on middle-aged population (25-74 years), NSHAP provides unique data on sexuality at older ages (57-84 years).

Given the importance of sexual health for overall person's quality of life and well-being, it is important to apply uniform public health indicators to compare sexuality across different populations. Health expectancy is a useful summary measure for identifying and quantifying overall health inequalities within population (Murray et al., 2000). Indicators of health expectancy have certain attractive properties such as independence of population structure and expression of health differentials in expected years of life. These indicators take into account both age-specific mortality and health, behavioral or socio-economic status information. The concept of health expectancy is now widely used for measurement and comparison of various aspects of health and quality of life. A variety of health expectancy measures use now this concept: active life expectancy (ADL) to compare activities of daily living, disability free life expectancy (DFLE) based on disability measurements, healthy life expectancy (HLE) based on measures of self-reported health, dementia-free life expectancy and others (Cambois et al., 2001; Wilkins, Adams, 1983; Guralnik et al., 1993; Kaprio et al., 1996; Crimmins, 2002). We propose to supplement this arsenal of health indicators with a new measure – sexually active life expectancy (SALE), which can be used for comparison of sexual health across populations.

METHODS

Data

This study examines the associations between sexuality and health using two nationally representative surveys: the National Survey of Midlife Development in the United States and the National Health, Social Life and Aging Project. The Midlife Development in the United States Survey (MIDUS) is a nationally representative survey of 3032 persons aged 25 through 74 years in the noninstitutionalized civilian population of the 48 coterminous United States. It was carried out between January 1995 and January 1996, with an overall response rate of 60.8%. The data were weighted to adjust for differential probabilities of selection and nonresponse. Details on the design, field procedures, and sampling weights are available elsewhere (Brim et al. 1995; Kessler et al., 1997; 1999).

The National Health, Social Life and Aging Project (NSHAP), a nationally-representative probability sample of community-dwelling individuals ages 57-85, was generated from households across the U.S. screened in 2004. African-Americans, Latinos, men and the oldest-old (75-84 years at the time of screening) were over-sampled. In-home interviews and biomeasure collection were conducted in English and Spanish by professional interviewers between July 2005 and March 2006, yielding 3,005 respondents (1,455 men and 1,550 women). The weighted sample response rate was 75.5%.

Self-Reported Health

Self-rated health is a widely regarded as a valid and reliable measure of health (Mattikainen et al., 1999), correlating well with other measures of morbidity and survival (Manor et al., 2001). In both MIDUS and NSHAP surveys respondents were asked to

rate their physical health using the standard 5-point scale with responses "excellent," "very good," "good," "fair," or "poor."

Sexuality

Respondents who are married, cohabiting, or reported having a "romantic, intimate, or sexual partner" are referred to as having a "spouse or other intimate relationship"; of these, those who had sex with at least one partner in the last 12 months are considered "sexually active." Sex was defined by the statement: "by sex or sexual activity we mean any mutually voluntary activity with another person that involves sexual contact, whether or not intercourse or orgasm occurs." Satisfaction with sex life was estimated on 10-point scale using responses to the question: "how would you rate the sexual aspect of your life these days" (responses ranging from 0 - "the worst possible situation" to 10 - "the best possible situation"). Individuals who rated their sexual aspect of life to be 6 or higher were considered as satisfied with sex life in the further analyses. Overall, 2-7% of respondents to the NSHAP survey refused to answer questions about sexual activities and problems.

Statistical Analysis

      Distributions of race/ethnicity, education, marital status and self-rated health are summarized separately by gender.

      Logistic regression (Hosmer, Lemeshow,) was used to model the likelihood of being sexually active, and of experiencing satisfaction with sex life. These models included age group, self-rated health (excellent/very good, good, and fair/poor) and partnership status as covariates, and were fit separately by gender. Results are presented as odds ratios together with 95% confidence intervals, indicating the multiplicative change in the odds of the outcome associated with a particular age or health category relative to those of the baseline category.

      All analyses use weights to adjust for differential probabilities of selection and differential non-response. Standard errors were computed using the linearization method, (Binder, 1983) taking into account the stratification and clustering of the sample design. All p-values reported are two-sided. All analyses were performed using the Stata statistical software package, release 9 (Stata Corp, 2005)

Life Table Analyses and SALE calculation

Sexually active life expectancy or SALE is a new indicator, which estimates the average number of years spent in a state of sexual activity by persons of a particular age. For each gender, SALE was calculated using Sullivan's method, which uses the prevalence of being sexually active in each age group. The number of total person-years by age was taken from the 1995 and 2003 official U.S. demographic life tables obtained from the Human Mortality Database and originally issued by the Office of the Actuary of the Social Security Administration. Statistical errors for SALE were calculated using the method of Mathers et al. (1999). SALE to life expectancy ratio (SLER) is a percentage of total expected life lived in a state of sexual activity.

RESULTS

      The distributions of key demographic variables in MIDUS and NSHAP studies closely match those from the 1995 and 2002 Current Population Surveys respectively. Men are more likely to be married than women; this difference increases steadily with

age (Table 1). The distribution of self-rated health across age groups is similar for men and women, with about half reporting very good/excellent health in the youngest age group versus about a third in the oldest.

Statistically significant association was found between global self-reported health and measures of sexuality (sexual activity and satisfaction with sex life). The likelihood of being sexually active declines steadily with age and is uniformly lower among women than men (Table 2). In addition, the likelihood of being sexually active is negatively associated with self-reported health (Table 2). For men who report their health as "very good" or "excellent," the odds of being sexually active are from 2.3 to 4 times higher than for those who report their health as "poor" or "fair" (Table 2), while for women the corresponding increase in odds is 3.9 times for the NSHAP population. Younger women in the MIDUS survey do not show substantial association between sexual activity and health.

For both men and women who report very good or excellent health the odds of being satisfied with sexual life are almost twice as high as for those who reported poor or fair health (Table 3). For women, satisfaction with sex life drops dramatically after age 55 whereas for men the decline of sexual satisfaction with age is more gradual (Table 3).

Table 4 shows the estimates of SALE at age 30 for men and women in the MIDUS study. For men, SALE is almost ten years lower than life expectancy for women the difference is almost 20 years. Although adult women enjoy longer life expectancy than men they have more than 4 years lower SALE (Table 4). The gender disparity in SALE is observed because at any given age, women are less likely than men to be sexually active. This difference increases dramatically with age (Table 2). Among those in the oldest age group, 78% of men versus 40% of women were currently in a relationship. In order to control for this gender disparity, we calculated SALE for only those who with a spouse or other intimate relationship. The estimates of SALE for persons with a partner show slightly higher SALE for women compared to men. However at older age (55 years) women still have lower SALE than men, although this difference is very small (Table 5). The SALE advantage of men at age 55 compared with women was 4.3 years for MIDUS study and 4.4 years for NSHAP study. This gender disparity almost disappears for persons having a partner.

Men in poor/fair health lose on average 5-8 years of sexually active life compared to their peers in very good/excellent health whereas women in poor/fair health lose only 3-5 years (Table 5). This finding suggests stronger effect of health on men's sexual activity. However effects of health on sexual satisfaction were similar in both genders (Table 3).

SALE at age 55 was 15.5 years for men and 11.1 years for women in the MIDUS study and 14.8 and 10.4 years respectively in the NSHAP study demonstrating a good correspondence of estimates between two surveys. The ratio of SALE to life expectancy (SLER) can be interpreted as the proportion of life spent in a sexually active state. The ratio of SALE to life expectancy was significantly lower for women compared to men due to higher female life expectancy in the United States.

DISCUSSION
This is the first study that has assessed the years of life spent in the sexually active state. Using SALE as a health expectancy measure offers researchers a possibility to study and compare sexuality across populations. We showed that women are significantly disadvantaged compared to men in sexually active life expectancy. The main reason for this disparity is inability to have a partner, particularly at older ages. Women having partner have similar to men sexually active life expectancy. However

even women having partners spend lower proportion of their lives in a state of sexual activity compared to men.

Our results support the conclusion that health is positively associated with sexuality. Both men and women with very good and excellent health are more likely to be sexually active and report satisfaction with sex life. This is in line with existing information pointing at the positive effect of sexual activity on physical health.

A number of limitations of the data and methods need to be considered in evaluating the results. The measures of sexuality used in this study are based on self-reports and there might be gender differences in reporting frequency of sex or sex satisfaction. As our results demonstrated, both men and women have similar dynamics of sexual activity and sex satisfaction by age and health status.

Due to the cross-sectional nature of the 1995-96 MIDUS dataset, we cannot draw conclusions about the direction of possible causal links between health status and sexuality. We can report only existence of statistical associations between self-reported health and sexuality measures. However, it is noteworthy that two different measures of sexuality produced similar results for both men and women in two different surveys.

Differences in sexuality among institutionalized persons combined with the underrepresentation of this population segment in the MIDUS and NSHAP surveys might have caused an underestimation of the gender differences in SALE. However, because mortality risks of persons living in institutions are very high, the effect will be only small.

The calculation of SALE is based on the Sullivan method, which is the standard method for health expectancy calculations on a routine basis. Although the Sullivan method generally provides a good measure of the current composition of a population (group) by sexual status, it is not based on transition rates. This limitation of the Sullivan method apparently does not significantly affect the results. It was shown that Sullivan method produced estimates of health expectancy comparable to more advanced multistate approach for populations with smooth and gradual changes in disability and morbidity (the case of the U.S. population) (Mathers, Robine, 1997). Comparing the MIDUS survey (1995-96) and the NSHAP survey (2003) shows little change in sexuality over the last decade. Also in this study we assumed the same mortality levels for persons with different health and partnership statuses. This assumption might underestimate SALE for persons with very good/excellent health or persons having partner and overestimate it for persons with poor/fair health. This problem stems from differential survival among persons with different health statuses and partnership. Taking into account that reliable age-specific and gender-specific estimates of survival by health status and partnership are not readily available and official life tables provide the most accurate data on mortality, we believe that the approach used in our study is warranted. The estimates of SALE reflect the existing gender and health disparities in sexuality, which was the main objective of this study.

Conclusions. There is an association between global self-reported health and both sexual activity and satisfaction with sex life. Significant gender disparities exist in SALE with women having less years spent in the state of sexual activity. Role of physical health in maintaining sexual activity is apparently higher for men than women. Public

health policy should be aware of this important aspect of quality of life and health at middle and older ages.

Our study provides important information for policymakers and researchers, because it documents the possible role of sexual health in overall physical health and the loss in SALE for individuals with poor health status. Our results show that, although women have higher life expectancy than men the length of their sexually active life is significantly lower. The main obstacle in reducing these gender disparities is the lack of partner for older women – a problem, which hopefully can be alleviated by reducing gender differences in life expectancy in the future.

Acknowledgments

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Table 1. Estimated population distributions (percentages) across demographic subgroups and self-rated health, by gender. MIDUS and NSHAP studies.

Characteristic	MIDUS		NSHAP	
	Men	Women	Men	Women
Age				
25-54	75.73	70.75	-	-
55-64	12.31	17.43	43.96	39.76
65-74	11.96	11.82	35.25	35.25
75-84	-	-	20.79	25.00
Race/Ethnicity				
White	84.68	83.16	85.55	84.35
African-American	9.73	12.72	9.17	10.79
Other	5.59	4.11	5.27	4.85
Education				
Less than HS	15.07	15.84	17.44	20.61
HS graduate	33.02	38.24	25.26	31.09
Some college/Assoc. degree	24.36	26.40	25.75	29.85
Bachelors degree or higher	27.55	19.51	31.55	18.45
Marital status				
Married	73.82	63.75	77.94	55.47
Living with a partner	6.01	6.20	1.91	2.38
Separated or divorced	9.78	14.85	8.89	13.64
Widowed	1.29	6.98	8.11	25.08
Never married	9.10	8.22	3.15	3.43
Self-rated health				
Poor/Fair	14.63	.18.27	25.49	24.23
Good	35.61	.36.70	27.48	31.52
Very good/Excellent	49.76	.45.04	47.03	44.25

TABLE 2-Proportions and Odds Ratios for having sex in the last 12 months by self-reported health and age.

Characteristics	Men		Women	
	% (SE)	OR (95% CI)	% (SE)	OR (95% CI)
MIDUS study				
Age				
25-54	91.17 (0.92)	**8.48** (p<0.001)	86.01 (1.10)	**19.67** (p<0.001)
55-64	86.33 (2.29)	**4.75** (p<0.001)	61.46 (3.08)	**3.29** (p<0.001)
65-74	62.10 (4.53)	1 (reference)	35.82 (4.50)	1 (reference)
Self-rated health				
Poor/Fair	74.40 (3.48)	1 (reference)	69.05 (3.24)	1 (reference)
Good	88.22 (1.56)	**1.94** (p<=0.013)	71.07 (2.16)	0.86 (p=0.027)
Very good/Excellent	90.10 (1.20)	**2.28** (p=0.001)	82.45 (1.45)	1.69 (NS)
NSHAP study				
Age				
57-64	80.76 (1.98)	**2.47** (p<0.001)	60.62 (2.48)	**2.45** (p<0.001)
65-74	62.88 (2.35)	1 (reference)	38.03 (2.44)	1 (reference)
75-84	38.15 (2.91)	**0.38** (p<0.001)	16.82 (2.10)	**0.38** (p<0.001)
Self-rated health				
Poor/Fair	44.98 (3.42)	1 (reference)	25.85 (2.52)	1 (reference)
Good	63.21 (2.68)	**2.39** (p<0.001)	40.76 (2.73)	**2.32** (p<0.001)
Very good/Excellent	77.52 (1.75)	**4.07** (p<0.001)	50.04 (2.33)	**3.90** (p<0.001)

TABLE 3-Proportions and Odds Ratios for reporting satisfaction with sex life by self-reported health and age.

Characteristics	Men		Women	
	% (SE)	OR (95% CI)	% (SE)	OR (95% CI)
MIDUS study				
Age				
25-54	67.72 (1.58)	**2.88** (p<0.001)	60.62 (1.69)	**2.95** (p<0.001)
55-64	55.12 (3.55)	**1.68** (p=0.037)	39.83 (3.16)	1.27 (NS)
65-74	41.46 (4.59)	1 (reference)	32.17 (4.55)	1 (reference)
Self-rated health				
Poor/Fair	49.54 (4.01)	1 (reference)	43.62 (3.59)	1 (reference)
Good	60.96 (2.49)	1.34 (NS)	48.59 (2.48)	1.13 (NS)
Very good/Excellent	68.73 (1.87)	**1.86** (p=0.001)	62.40 (2.03)	**1.85** (p<0.001)

TABLE 4-Gender differences in Life Expectancy (LE), Sexually Active Life Expectancy (SALE), and Sex to Life Expectancy Ratio (SLER) at Age 30. MIDUS study.

	Men	Women
All		
LE-30 (years)	44.73	50.44
SALE-30 (years)	35.72	31.28
SLER (%)	79.86%	62.01%
Have partner		
SALE-30 (years)	37.81	39.10
SLER (%)	84.53%	77.52%

Table 5.
Sexually active life expectancy to Life Expectancy Ratio (SLER) at Age 30 for all individuals, individuals having a partner and individuals reporting poor or very good/excellent health.

	SALE-55 (years)		SLER-55 (%)	
	Men	Women	Men	Women
MIDUS study				
All	15.46	11.12	67.21	40.74
Have partner	16.50	16.47	71.74	60.32
Self-rated health				
Poor/Fair	11.91	10.45	51.78	38.29
Very good/Excellent	17.29	13.27	75.17	48.62
NSHAP study				
All	14.77	10.36	60.64	37.23
Have partner	16.18	15.69	66.44	56.37
Self-rated health				
Poor/Fair	10.77	7.05	44.25	25.33
Very good/Excellent	17.15	12.26	70.42	44.07