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Self-rated Health in Relation to Rape and Mental Health Disorders in a National Sample of College Women

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Abstract

Objective—The purpose of this study was to employ a multivariate approach to examine the correlates of self-rated health in a college sample of women, with particular emphasis on sexual assault history and related mental health outcomes.

Participants—A national sample of 2,000 female college students participated in a structured phone interview between January and June, 2006.

Methods—Interview modules assessed demographics, posttraumatic stress disorder, major depressive episode, substance use, rape experiences, and physical health.

Results—Logistic regression analyses showed that poor self-rated health was associated with low income (OR = 2.70), lifetime posttraumatic stress disorder (OR = 2.47), lifetime major depressive episode (OR = 2.56), past year illicit drug use (OR = 2.48), and multiple rape history (OR = 2.25).

Conclusions—These findings highlight the need for university mental health and medical service providers to assess for rape history, and to diagnose and treat related psychiatric problems in order to reduce physical morbidity.

Keywords

sexual assault; physical health; PTSD; Depression; substance use

Introduction

Population-based studies indicate that between 13% and 18% of women in the United States are affected by rape at some point in their lives [1–4]. The psychiatric correlates and health risk behaviors associated with sexual assault (e.g., posttraumatic stress disorder [PTSD], depression, substance use and abuse) are well-documented [4–8], and a growing literature is beginning to demonstrate the physical health correlates of victimization [9, 10]. However, in comparison to what is known about mental health correlates, much less is known regarding the prevalence and risk factors associated with poor physical health status in rape victims.

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College women are a particularly important group to study, as the highest age-related risk group of sexual victimization is ages 18–34 [1], which encompasses the average ages of college students.

Existing data suggest that rape and other forms of sexual assault have broad-reaching effects on a woman's physical health, including somatic complaints [11, 12], gynecological problems [13], increased medical service utilization [14, 15], and poor overall health status [11, 15–19]. Given that overall health status is associated with long-term morbidity, mortality, economic burden, and impairment in occupational and social functioning [20–24], understanding correlates of poor self-rated health is important. Several variables have been shown in past research to account for variability in self-rated health, such as lower income and education, African American racial identification [25] and psychopathology [26, 27]. However, research examining the relation between rape characteristics and physical health is lacking. In one study, sexual assaults by strangers were associated with increased risk of physical health problems [17]. Others have found that assaults involving forced or physically injurious intercourse appear to be more strongly related to functional limitations and physical health symptoms [26, 28]. Health risk behaviors, such as substance use, have also been found to increase following the experience of sexual assault [29–31], and relate to overall health status [32].

PTSD, depression, and substance use are the most widely established psychiatric and health behavior correlates of sexual assault. In comparison to other types of trauma, the experience of sexual assault is associated with a higher risk for these adverse mental health outcomes[33, 34]. Furthermore, PTSD, depression, and substance use exhibit high comorbidity among trauma victims[35]. Emerging research suggests that these trauma-related sequelae, such as PTSD, may serve as mediators between trauma and physical health problems.[36] However, no known studies have examined rape characteristics, rape-related mental health problems, and associated health risk behaviors within a single multivariate model predicting self-rated health. Because many of these problems co-occur, it is necessary to utilize multivariate models to determine whether each of these risk factors exerts unique effects on health outcomes.

In addition to the lack of multivariate models, the research on sexual assault and self-rated health is limited by a number of factors. These include the use of convenience samples, small sample sizes, lack of differentiation between rape and other forms of sexual assault, and lack of differentiation between different rape tactics (e.g., forcible versus incapacitated rape). Furthermore, little is known about the influence of rape characteristics, repeated victimization, and substance use on physical health among representative samples of women. Greater understanding of characteristics associated with poor health in college women has the ability to inform campus health promotion interventions in targeting groups in need of assistance.

The current study extends the current literature on risk factors for poor overall health status by examining demographic characteristics, history of multiple rapes, different rape tactics, psychopathology, and substance use as contributors to risk for poor self-rated health in a national college sample of women. We hypothesized that multiple rape experiences, forcible rape, psychopathology (lifetime PTSD and depression), and substance use would be associated with significantly increased odds for poor self-rated health.

Method

Participants

The list sample for college women was purchased from the American Student List (ASL), the largest and most widely used list of students in the United States. This list includes six million students who are currently attending approximately 1,000 U.S. colleges and universities. The sample list purchased contained about 17,000 randomly selected students. Respondents were stratified by region of the country, randomly selected, then released to a national surveying firm, SRBI (Schulman, Ronca, Bucuvalas, Incorporated), to be contacted via random digit dial methodology in proportion to the national census representation of college women. There were 253 different schools included in the sample from 47 different states. Two thousand telephone interviews (N=2,000, mean age = 20.13, *SD* = 3.19) were conducted.

Measures

Self-rated health—General health was measured by asking women to rate their health in comparison to other people their own age. Response choices ranged from "poor" to "excellent." Due to the skewed distribution on this variable (only 1% reported poor health and 3% reported fair health), responses were dichotomized into "poor/only fair" health or "good/very good/excellent" health. This approach is consistent with the standard and psychometrically supported use of this measure.[17, 23, 37–40] For example, one study found results to be similar when comparing the dichotomous to the continuous version of this variable.[40] This was also the case for the current study; therefore, findings are presented using the dichotomous variable.1

Mental Health—Lifetime posttraumatic Stress Disorder (PTSD) and lifetime major depressive episode (MDE) were assessed with the National Women's Study (NWS) PTSD and major depressive episode modules, structured interviews based on *Diagnostic and Statistical Manual of Mental Disorders* [41] criteria, similar to other studies [42, 43]. The MDE module consists of 19 items and assesses hallmark symptoms of depression, including persistent feelings of sadness as well as loss of interest or pleasure. Research on the NWS-PTSD and MDE modules has provided support for concurrent validity, internal consistency, and several forms of reliability [7, 8].

Substance Use—Five dichotomous substance use variables were measured in this study: past year substance abuse, past year binge drinking, past year non-experimental illicit drug use, past year non-experimental marijuana use, and past year non-experimental, non-medical use of prescription drugs (NMUPD). Past year substance abuse was assessed with 8 items using the substance use module from the NWS interview, approximating the criteria set forth by the DSM-IV. These criteria were modified to include women meeting criteria for dependence, as well as abuse, and have been shown to have adequate face and construct validity [30]. Past year binge drinking was defined as consumption of five or more drinks of an alcoholic beverage on one occasion with at least monthly frequency (at least 12 or more days within the past year [44]). Past year illicit drug use was defined as using at least one of the following drugs in the past year: cocaine, crack, PCP, heroin, methadone, inhalants, ecstasy, GHB, Ketamine, Rohypnol, Methamphetamine, and LSD/hallucinogens. Past year non-experimental marijuana use was defined as using marijuana four or more times in the past year. Finally, non-experimental NMUPD was assessed by asking women if they used various drugs non-medically four or more times during the past year (i.e., from a source other than their own prescription, beyond the amount prescribed, or for some reason other

[1]Results for study analyses using the continuous self-rated health variable are available from the author upon request.

than prescribed). These drugs included: tranquilizers (e.g., Valium), sedatives (e.g., Ambien), stimulants (e.g., Ritalin), and pain medicines (e.g., Percodan).

Rape Experiences—We assessed women's most recent or only incident of rape. For women who reported more than one rape, we also assessed the first incident of rape. Rape was defined as penetration of the victim's vagina, mouth, or rectum without consent. Cases were defined as forcible rape (FR) if the perpetrator used physical force or threat of force. The key element of incapacitated rape (IR) was that the victim perceived the perpetrator to have raped her when she was intoxicated **or** impaired via voluntary intake of drugs or alcohol by the victim. In contrast, the key element of drug and alcohol-facilitated rape (DAFR) was that the victim perceived the perpetrator to have deliberately attempted to produce incapacitation by administering drugs or alcohol to the victim. Classification of individuals into rape categories was nonmutually exclusive. Women who reported both a most recent incident and a first incident rape were considered to have experienced multiple rapes.

Procedure

Women completed structured telephone interviews. A computer-assisted telephone interview system aided this process by prompting trained interviewers with each question consecutively on a computer screen. English and Spanish versions of the interview were administered based on respondent language preference. Completed interviews averaged 20 minutes. After determining that the respondent was a female undergraduate student over age 18, the interviewer introduced the study and verbal consent was obtained. Participant distress was assessed at the end of the interview and they were provided with the option of contacting a counselor. This study was approved by the Institutional Review Board at the Medical University of South Carolina.

Statistical Analyses

Logistic regression analyses were conducted to identify variables within each empirically derived predictor set: demographics (age, race/ethnicity, education, income), mental health (lifetime PTSD, lifetime MDE), past year substance use (binge drinking, substance abuse, marijuana use, illicit drug use, NMUPD), and rape history (history of FR, history of IR, history of DAFR, history of multiple rapes) that were associated with self-reported health. Significant predictors emerging from these analyses (using a cutoff of $p < .05$) were entered into a final multivariable logistic regression analysis predicting health. SUDAAN (version 10.0) was used for all regression analyses to account for the complex survey design.

Results

Table 1 presents sample characteristics for the full sample. Four percent (n=86) of women reported poor health. Table 2 presents results from the individual models, and Table 3 presents results from the final multivariate model.

Demographics

The only variable within the demographic model that reached significance was income ($p < .01$). Specifically, individuals with incomes (family or individual) less than $20,000 were 2.92 times more likely to report poor health than individuals making over $60,000. Individuals in the middle income category, $20,000–60,000 were not at an increased risk for poor health compared to those in the highest income group.

Mental Health and Substance Use

Both lifetime PTSD and MDE were predictive of increased risk of poor health (ORs=2.70, 2.86, respectively). Only past year illicit drug use (OR=2.88) was associated with poor health.

Rape Types

Within the rape type model, only history of multiple rapes (OR=3.14) was associated with poor health. Forcible rape (FR) (OR=2.32, p=.06) was marginally predictive of poor self-rated health.

Final Model

All significant predictors from the individual models were entered into a final multivariable model (See Table 3), and all predictors remained significant. Women with personal or family incomes of less than $20,000 were 2.70 times more likely than women with incomes over $60,000 to report poor health. Lifetime PTSD afforded risk for poor health (OR=2.47), as did lifetime MDE (OR=2.56). Past year illicit drug users were 2.48 times more likely to report poor health than women who had not used illicit drugs. Lastly, a history of multiple rapes was associated with an increased risk for poor health (OR=2.25).

Comment

Conclusions

The current study extended the literature on sexual assault, mental health, and physical health among women by using a multivariate model to predict self-rated health in a national sample of college women. PTSD, MDE, sexual revictimization, and low income were all related to physical health status. The use of a multivariate model allowed us to determine that these co-occurring trauma-related variables demonstrate a unique association with self-rated health, in the context of other risk factors. The majority of prior studies has examined the relation between mental and physical health within symptomatic clinical samples or older adults. Our findings in this relatively healthy college sample underscore the robustness of the connection between mental and physical health (only 4% endorsed poor health in our study). Furthermore, prior studies have primarily focused on revictimization in relation to mental health outcomes. This represents the first known study to document a significant association between sexual revictimization and self-rated physical health status.

Of particular interest in this study was the influence of rape tactics and rape characteristics on health status. As expected, repeated victimization was associated with a greater likelihood of reporting poor physical health status. Several mechanisms may account for this association, including a greater likelihood of physical injury and an increased probability of mental health problems that are linked with chronic physical conditions [45]. Furthermore, repeated victimization can be considered a chronic stressor, which leads to persistently elevated levels of stress hormones, in turn resulting in general immunosuppression[46]. Current research suggests that victims of sexual assault exhibit dysregulation in the hypothalamic-pituitary-adrenal (HPA) axis, which results in lowered cortisol levels and inflammatory responses.[47, 48] HPA disruption can lead to chronic inflammatory disorders, chronic pain syndromes, and a variety of somatic symptoms[49]. Trauma-related mental health problems such as PTSD and depression may mediate the relationship between repeated victimization and dysregulated immune functioning[50].

Contrary to expectations, rape tactics and rape characteristics were not predictive of physical health. However, women reporting FR were more than twice as likely as women without FR to report poor health. Differences between FR and non-FR women may be less pronounced

among college-aged women who are generally in good health, and it is likely that physical health differences would increase as the health outcomes associated with chronic trauma-related mental health problems develop over time. It is also possible that rape tactics shared variance with multiple rape history, which emerged as a more important predictor in the multivariate model. Furthermore, the lack of a direct effect of rape tactics on health outcomes suggests that an interaction may exist, potentially between rape tactics and incident characteristics (e.g., relationship to the perpetrator). Finally, the healthiness of this college sample likely limited our ability to detect relations between study variables and self-rated health.

As predicted, both PTSD and MDE were related to poor health. This is consistent with prior literature, which suggests that the persistent physiological arousal, decreased activity levels, and disrupted sleep patterns associated with these disorders represent pathways to poor immune functioning [51–54] In addition to PTSD and MDE, illicit drug use was associated with poor self-rated health. While significant substance use represents a risky health behavior associated with prior trauma exposure [29–31], it is also a general risk factor for poor health[55]. Although other substance use variables did not attain significance, this may be due to the fact that other forms of substance use are more normative in the college population and less likely to indicate a persistent pattern of abuse in comparison to a community population. In general, the links among mental health, substance use, and physical health in this sample of college women suggest that university counseling and medical centers should collaborate to implement interventions that address these problems. For example, effective interventions might increase activity levels, improve sleep hygiene, reduce illicit substance use, and generally reduce symptoms of PTSD and depression.

Finally, low income was associated with poor self-rated health in the current study. This finding is consistent with prior studies [25]. There are several factors that may contribute to this relationship, including the chronic stress of poverty, lack of access to quality healthcare, and lack of knowledge regarding available resources. These findings are indicative of health disparities that deserve significant attention at the systemic level.

Limitations

While this study possessed several strengths, including a national sample, the use of multivariate models, and the inclusion of rape tactics and rape characteristics, several limitations should be noted. First, the use of retrospective self-report may entail potential recall biases and the cross-sectional nature of the study limited our ability to detect causal relationships. Second, the use of a brief interview necessitated by budget restrictions limited the comprehensive assessment of other factors potentially influencing self-rated health (e.g., chronic physical conditions, other traumatic events), as well as the ability to assess the temporal direction of predictors. Third, the ability to detect significant correlates of self-rated health was restricted by limited variability in health status among the college population.

Implications

The current study highlights the importance of attending to repeated sexual victimization, mental health and substance use disorders, and income when identifying young women at risk for physical health problems. These findings also have several implications for future intervention and research. First, this study suggests that staff at university health centers would benefit from education on mental health problems and their associations with physical health. In addition, prior researchers have underscored the need for a universal screening of interpersonal violence in health care settings. Such a screen would assist in early identification of victims *before* physical health problems develop.[56] Our findings

suggest that mental health and substance use problems could also serve as unique predictors of future health problems and therefore, would be helpful to include in screens of otherwise healthy individuals. At-risk students could be linked to preventive services, mental health treatment, and information on how to reduce risk for revictimization. Similarly, staff at university counseling centers could assess for physical health symptoms in conjunction with rape history and psychiatric symptoms, and increase collaboration with other healthcare providers. These findings add support for campuswide efforts to prevent sexual assault and revictimization, as well as to increase students' awareness of available services.

Future research could extend our findings by examining other types of violence in relation to self-rated physical health. Furthermore, interactions between incident characteristics and rape tactics should be explored. Longitudinal studies are also necessary to establish the causal direction between rape history, psychiatric disorders, demographics, and health. In addition, further research is needed to determine the impact of type and timing of medical service delivery on health outcomes. Finally, future studies should examine the mechanisms by which sexual assault and mental health symptoms affect physical health, such as neuroendocrine functioning and risky health behaviors. In sum, this study suggests that the relations among sexual revictimization, psychiatric symptoms, and physical health represent fruitful avenues for future study.

Acronyms

PTSD	posttraumatic stress disorder
IR	incapacitated rape
DAFR	drug and alcohol facilitated rape
FR	forcible rape
RDD	Random-digit-dial
MDE	Major Depressive Episode
NMUPD	Non-medical Use of Prescription Drugs
NWS	National Women's Study
CATI	Computer-assisted telephone interviewing

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Table 1

Frequencies for Study Variables (N=2,000)

Variable	N	%
Health Status		
Good/Very Good/Excellent	1913	95.7
Fair/Poor	86	4.3
Age		
18–20	1428	71.4
21 and older	572	28.6
Race		
Caucasian	1500	75.6
African American	221	11.1
Hispanic	120	6.1
Other	142	7.2
Education		
Freshman	707	35.4
Sophomore	486	24.3
Junior	403	20.2
Senior	404	20.2
Income		
<$20,000	198	11.1
$20,000–$60,000	604	33.9
>$60,000	982	55.0
Lifetime PTSD		
No	1640	82.2
Yes	360	18.0
Lifetime MDE		
No	1679	84.0
Yes	321	16.0
Past Year Substance Abuse		
No	1604	80.2
Yes	396	19.8
Past Year Binge Drinking		
No	1649	84.3
Yes	307	15.7
Past Year Illicit Drug Use		
No	1921	96.1
Yes	78	3.9
Past Year Non-Experimental Marijuana Use		
No	1774	88.7
Yes	225	11.3
Past Year Non-Experimental Non-Medical Prescription Drug Use		

Variable	N	%
No	1936	96.8
Yes	64	3.2
History of Incapacitated Rape		
No	1916	95.8
Yes	84	4.2
History of Drug or Alcohol Facilitated Rape		
No	1946	97.3
Yes	54	2.7
History of Forcible Rape		
No	1826	91.3
Yes	174	8.7
History of Multiple Rapes		
No	1904	95.2
Yes	96	4.8

Table 2

Logistic Regression Results: Self-Rated Health

Predictor	OR	95% CI	p-value
Model 1: Demographics			
Age			
18–20	1.00	-	0.11
21 and older	1.97	0.86–4.53	
Race			
Caucasian	1.00	-	0.44
African American	1.27	0.65–2.49	
Hispanic	0.70	0.24–1.97	
Other	0.49	0.15–1.60	
Education			
Freshman	2.59	0.91–7.35	0.36
Sophomore	2.14	0.74–6.14	
Junior	1.58	0.70–3.58	
Senior	1.00	-	
Income			
<$20,000	2.92	1.59–5.36	<.01
$20,000–$60,000	1.17	0.68–2.02	
>$60,000	1.00	-	
Model 2: Mental Health			
Lifetime PTSD			
No	1.00	-	<.001
Yes	2.70	1.44–5.08	
Lifetime MDE			
No	1.00	-	<.001
Yes	2.86	1.52–5.40	
Model 3: Substance Use			
Past Year Substance Abuse			
No	1.00	-	0.32
Yes	1.32	0.75–2.32	
Past Year Binge Drinking			
No	1.00	-	0.25
Yes	0.66	0.33–1.33	
Past Year Illicit Drug Use			
No	1.00	-	0.03
Yes	2.88	1.13–7.33	
Past Year Non-Experimental Marijuana Use			
No	1.00	-	0.82
Yes	1.08	0.53–2.20	
Past Year Non-Experimental NMUPD			

Predictor	OR	95% CI	p-value
No	1.00	-	0.38
Yes	1.62	0.55–4.79	
Model 4: Rape Types			
History of Incapacitated Rape			
No	1.00	-	0.62
Yes	0.80	0.33–1.93	
History of Drug-Alcohol Facilitated Rape			
No	1.00	-	0.16
Yes	0.67	0.23–1.94	
History of Forcible Rape			
No	1.00	-	0.06
Yes	2.32	0.97–5.55	
Multiple Rapes			
No	1.00	-	0.02
Yes	3.14	1.20–8.18	

Table 3

Logistic Regression Results: Final Model of Self-Rated Health

Predictor	OR	95% CI	p-value
Income			
<$20,000	2.70	1.43–5.07	<.01
$20,000–$60,000	1.21	0.65–1.94	
>$60,000	1.00	-	
Lifetime PTSD			
No	1.00	-	0.01
Yes	2.47	1.24–4.90	
Lifetime MDE			
No	1.00	-	<.01
Yes	2.56	1.33–4.92	
Past Year Illicit Drug Use			
No	1.00	-	0.04
Yes	2.48	1.04–4.84	
Multiple Rapes			
No	1.00	-	0.03
Yes	2.25	1.11–4.58	