

LIFESTYLE BEHAVIORS AND MENTAL HEALTH OF AMERICAN ADULTS

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Abstract:

Summary. The purpose of this study was to test the hypothesis that individuals reporting healthy lifestyle behaviors would also report better self-rated mental health. Logistic regression analyses were conducted utilizing SUDAAN on the Behavioral Risk Factor Surveillance Survey data set. This descriptive analysis suggests that persons reporting poor mental health were more likely to report unhealthy lifestyle behaviors. This set of findings encourages careful design of experimental studies of empirically based associations of mental health and life style, using psychometrically sound measures. Then public health programs focused on change of health-related behaviors might be more suitably devised.

Article:

To assess the mental health of people and to address the problems associated with poor mental health, researchers devised a simple method of evaluating mental health status. One method of collecting such information on mental health is through self-reports. The Centers for Disease Control and Prevention (CDC) published a comprehensive report entitled, *Measuring Healthy Days: Population Assessment of Health-related Quality of Life* (CDC, 2000), which describes the validity of utilizing self-rated health reports related to physical and mental health. The report indicates that population-based surveys developed and validated by the CDC incorporate a compact set of health-related quality of life measures, including brief physical and mental health measures, approved by a collaborative team initiated in 1989 by the Division of Adult and Community Health in the CDC's National Center for Chronic Disease Prevention and Health Promotion.

The purpose of this study was to use the self-report data from a survey developed by the CDC (2003)² to test the hypothesis that individuals reporting briefly healthy lifestyle behaviors, such as engagement in physical activity and abstaining from smoking, will also report better self-rated mental health, i.e., fewer mentally unhealthy days. A study conducted by Rohrer, Pierce, and Blackburn (2004), tested this hypothesis on data collected by the health department in Amarillo, TX in 2002. The present authors aimed to contribute additional information to the Rohrer, *et al.* study (2004) by analyzing the 2003 Behavioral Risk Factor Surveillance Survey (BRFSS) data from all respondents! As mentioned by Rohrer and colleagues, the rationale for this hypothesis involves recognized relationships between physical and mental health.

METHOD

Sample

The BRFSS is a state-based surveillance system conducted and supported by the CDC's Behavioral Surveillance Branch. A complete description of the random sampling procedures and design of the survey is available elsewhere (CDC BRFSS User's Guide, 1998).³ In summary, this system is the largest, continuously conducted telephone health survey in the world. Participants in the survey include residents in all 50 states and the District of Columbia. In addition, many national, state, and local surveys utilize the same brief measures and methods as the Behavioral Risk Factor Surveillance Survey. This makes the system a regularly utilized resource in the public domain for gathering data and making comparisons regarding population health (CDC, 2000).

Measures

The BRFSS is the primary source of state-based data related to the behaviors and conditions associated with adults (ages > 18 years) being said to be at risk for chronic disease. Specifically, the main objective of the BRFSS is to collect standardized, state-specific data briefly on preventive health practices and risk behaviors linked to chronic diseases, injuries, and preventable infectious diseases in the U.S. adult population. Data were collected monthly by trained interviewers using an independent probability sample of households with telephones among the noninstitutionalized U.S. population. In 2003,² data from 264,684 persons were collected by the CDC.

The dependent variable for this set of descriptive analyses was self-rated mental health. Respondents were asked the following question: "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?" (CDC, BRFSS, 2003): According to the CDC analysis (2000), individuals reporting 14 or more days were classified as having poor mental health, and individuals who indicated less than 14 days were classified as having good mental health. This criterion was utilized for the present analysis.

Participants were also asked demographic and lifestyle questions. The lifestyle or independent predictor variables for this study included smoking (smoker versus nonsmoker), engagement in physical activity (exercised in the last 30 days), body weight (overweight or obese according to calculated Body Mass Index), self-rated general health, and activities limited by health problem(s) (yes or no). The demographic questions included age, sex, race, marital status, employment status, education, income, and health care plan (have one or not).

Data Analyses

All analyses were conducted utilizing Software for the Statistical Analysis of Correlated Data (Survey Data Analysis—SUDAAN) to account for the complex survey design and weighted sample of the Behavioral Risk Factor Surveillance Survey. In this study, logistic regression was applied because the dependent variable is dichotomous and the independent variables are of any type. The logistic model predicts the dependent variable of mental health status on the basis of the independent variables. The odds ratio and 95% confidence intervals of each independent variable were estimated based on the standard errors derived from the SUDAAN procedures.

The univariate logistic analysis was first conducted to examine the association of each independent variable and the dependent variable without controlling for the effect of other independent variables. Then, the multivariate logistic regression was conducted and the adjusted odds ratios and confidence intervals were obtained.

RESULTS

Descriptive Information

The proportion of participants in the sample (N=259,427) indicating poor mental health, i.e., classified 14 or more days on the mental health question, was 9.6%. The remaining respondents were classified as having good mental health. The demographic characteristics of respondents are reported in Table 1.

Univariate Analysis

The unadjusted odds ratios (OR) were calculated for each independent variable, which do not take into account the other independent variables in the study (see Table 2 for these data).

Multivariate Analysis

In the multivariate analysis, the odds ratio for a particular variable is computed by considering the other variables in the model; therefore, the odds ratio is referred to as the adjusted odds ratio (AOR). Multivariate analyses were conducted with significant variables from the univariate analysis (see Table 2).

TABLE 1
Description of Respondents from the Behavioral Risk Factor Surveillance Survey (2003)

Variable	f	Valid %	Variable	f	Valid %
Age yr.			Sex		
18-29	36,448	21.5	Male	104,400	48.4
30-39	46,339	19.2	Female	160,284	51.6
40-54	81,826	29.3	BMI		
> 55	98,017	30.0	Neither overweight nor obese	102,534	40.6
Education			Overweight	90,831	36.6
Never attended school / only kindergarten	448	.2	Obese	58,493	22.8
Grades 1-8	10,109	4.3	Marital Status		
Grades 9-11	18,640	7.7	Married	144,499	58.8
Grade2 or GED	80,633	30.4	Divorced	36,608	9.3
College 1-3 yr.	71,345	26.7	Widowed	29,029	6.9
College 4 yr. or more	82,864	30.5	Separated	6,744	2.3
Race			Never married	39,646	18.7
Caucasian	206,158	70.1	Unmarried Couple	7,310	3.9
African American	20,684	9.7	Employment Status		
Asian	4,795	2.7	Employed for wages	131,047	51.8
Native Hawaiian or Pacific Islander	1,086	.4	Self-employed	24,497	8.8
American Indian or Alaskan Native	3,987	1.1	Out of work > 1 yr.	4,551	2.0
Other	1,770	.8	Out of work < 1 yr.	7,867	3.9
Multiracial	4,249	1.6	Homemaker	21,882	8.0
Hispanic	19,652	13.7	Student	7,342	4.6
Have Health Care Coverage			Retired	52,849	16.2
Yes	230,018	84.5	Unable to work	13,930	4.7
No	33,945	15.5	Income		
Exercise in Last 30 Days			< \$15,000	29,083	11.6
Yes	198,389	75.4	\$15,000 -\$25,000	43,042	17.9
No	65,889	24.6	\$25,000 -\$50,000	73,872	32.0
Self-reported General Health			> \$50,000	83,330	39.5
Excellent	55,289	21.2	Activities are Limited by Health Problems		
Very Good	85,902	32.7	Yes	55,028	18.7
Good	77,191	29.8	No	203,505	81.3
Fair	31,988	11.8	Smoking		
Poor	13,573	4.4	Smoker	56,294	22.1
			Nonsmoker	208,337	77.9

Considering the correlated effect among independent variables, these results indicated that the odds of a respondent indicating good self-rated mental health were higher for individuals indicating excellent general health and access to health care coverage. Male participants had AORs for good mental health which were higher than those for the females. Divorced, separated, and never married participants had lower odds of self-rated good mental health than married participants. Persons who had never attended school or who had only attended kindergarten had the lowest odds of reporting good mental health; however, as education increased, the odds of good mental health also increased.

Self-reported mental health was increasingly better with age. Persons ages 18 to 29 indicated a lower self-reported mental health status than did individuals in other age groups. The remaining age groups (30-39 and 4054) showed lower AOR than the reference group who were 55 years and older (refer to Table 2). These results also suggested that individuals within <\$15,000 income range were more likely to report poor mental health than those participants within the other income groups (refer to Table 2).

TABLE 2
Odds Ratios, 95% CI, and Significance of Independent Variables in Dataset

Variable	Unadj OR	95 % CI	Adj OR	95 % CI
General Health				
Excellent	13.96	(12.51, 15.51)*	6.48	(5.58, 7.52)*
Very good	9.04	(8.27, 9.89)*	4.64	(4.07, 5.29)*
Good	5.76	(5.29, 6.28)*	3.39	(3.01, 3.83)*
Fair	2.63	(2.40, 2.88)*	1.92	(1.71, 2.16)*
Poor	1.00		1.00	
Health Care Coverage				
Yes	1.70	(1.59, 1.82)*	1.10	(1.01, 1.19)*
No	1.00		1.00	
Exercise Last 30 Days				
Yes	1.96	(1.87, 2.07)*	1.15	(1.08, 1.24)*
No	1.00		1.00	
Marital Status				
Divorced	0.47	(0.44, 0.50)*	0.72	(0.66, 0.78)*
Widowed	0.75	(0.68, 0.82)*	0.94	(0.81, 1.08)
Separated	0.29	(0.26, 0.33)*	0.54	(0.46, 0.63)*
Never married	0.64	(0.60, 0.69)*	0.87	(0.79, 0.96)*
Unmarried Couple	0.57	(0.50, 0.65)*	0.86	(0.79, 0.96)*
Married	1.00		1.00	
Education				
Never attended school / or only early kindergarten	0.32	(0.20, 0.50)*	0.48	(0.24, 0.97)*
Grades 1-8	0.39	(0.34, 0.45)*	0.88	(0.73, 1.05)
Grades 9-11	0.33	(0.30, 0.36)*	0.83	(0.73, 0.94)
Grades 12 or GED	0.50	(0.47, 0.54)	0.82	(0.75, 0.89)*
College 1-3 yr.	0.55	(0.52, 0.59)*	0.78	(0.72, 0.85)*
College 4 yr. or more	1.00		1.00	
Employment Status				
Self-employed	1.09	(0.98, 1.20)	1.01	(0.90, 1.13)
Out of work > 1 yr.	0.30	(0.27, 0.35)*	0.57	(0.48, 0.67)*
Out of work < 1 yr.	0.34	(0.31, 0.39)*	0.52	(0.45, 0.60)*
Homemaker	0.76	(0.69, 0.83)*	0.92	(0.82, 1.03)
Student	0.81	(0.70, 0.93)*	0.99	(0.83, 1.18)
Retired	1.27	(1.18, 1.37)*	1.22	(1.07, 1.39)*
Unable to work	0.15	(0.14, 0.16)*	0.59	(0.52, 0.67)*
Employed for wages	1.00		1.00	
Income				
< \$15,000	0.27	(0.25, 0.29)*	0.78	(0.69, 0.88)*
\$15,000 - \$25,000	0.43	(0.40, 0.47)*	0.85	(0.77, 0.94)*
\$25,000 - \$50,000	0.64	(0.60, 0.69)*	0.93	(0.85, 1.01)
\$50,000 or more	1.00		1.00	
Activities limited by Health Problems				
Yes	0.24	(0.23, 0.25)*	0.41	(0.38, 0.44)*
No	1.00		1.00	
Race / Ethnicity				
African American	1.21	(1.10, 1.33)*	0.86	(0.76, 0.98)*
Asian	0.89	(0.79, 1.00)	0.93	(0.80, 1.08)
Native Hawaiian or Pacific Islander	1.75	(1.32, 2.31)*	0.94	(0.68, 1.31)
American Indian or Alaskan Native	1.19	(0.67, 2.10)*	0.67	(0.37, 1.21)
Hispanic	0.70	(0.58, 0.84)*	0.77	(0.62, 0.96)*
Multiracial	0.94	(0.72, 1.21)	0.76	(0.53, 1.09)
Other	0.61	(0.48, 0.77)*	0.81	(0.62, 1.06)
Caucasian	1.00		1.00	
Age yr.				
18-29	0.67	(0.62, 0.72)*	0.42	(0.37, 0.48)*
30-39	0.75	(0.70, 0.81)*	0.46	(0.41, 0.52)*
40-54	0.69	(0.65, 0.74)*	0.58	(0.53, 0.64)*
> 55	1.00		1.00	
Body Mass Index				
Neither overweight or obese	1.39	(1.31, 1.48)*	1.04	(0.97, 1.12)
Overweight	1.53	(1.44, 1.64)*	1.07	(1.00, 1.16)
Obese	1.00		1.00	

Smoking				
Nonsmoker	2.39	(2.27, 2.52)*	1.69	(1.58, 1.81)*
Smoker	1.00		1.00	
Sex				
Male	1.45	(1.37, 1.52)*	1.51	(1.42, 1.62)*
Female	1.00		1.00	

* $p < .05$

Lifestyle variables also played a role in self-reported mental health. The odds of good mental health for participants whose activity levels were limited by their acknowledged health problems were lower than those for individuals not hindered by their health problems. Also, reported nonsmokers indicated a higher adjusted odds ratio than smokers for reporting good mental health. The last finding relates to lifestyle variables involving Body Mass Index using category measures (neither overweight or obese, overweight, and obese) for each participant. The odds of participants reporting good mental health in any of the three Body Mass Index categories is virtually the same (cf. Table 2 for the AORs).

DISCUSSION

These results indicate the hypothesis that lifestyle factors are related to self-rated mental health is supported in this cross-sectional study. Although causal inferences cannot be made from this study, important relationships shown elsewhere between lifestyle *and* mental health are recognized (cf. Pijls, Feskens, & Kromhout, 1993; Idler & Benyamini, 1997). According to Rohrer, *et al.* (2004), mental health outcomes are rarely included in evaluations of public health programs. The present authors suggest that such mental health outcomes are important to *include* as variables in research because these are based on previously conducted studies (Williamson & O'Neill, 1998; Ford, Moriarty, Zack, Mokdad, & Chapman, 2001; Rohrer, *et al.*, 2004) and the current study.

Data collected via the BRFSS creates a rich data source for preliminary valuation of self-rated mental health, physical health, and health-related quality of life (Moriarty & Zack Kobau, 2003). The analyses presented here indicate how these data collected by the CDC might be utilized to develop hypotheses about important changes and risk factors in self-rated mental health. However, as with most studies, this study is not without limitations. The study is built upon the assumption that self-ratings of mental health provide valid estimates of mental health status. No psychometric data are available on these measures, but there is evidence in independently conducted studies using other measures which encourage pursuit of the observations. Other limitations include the fact that this is a cross-sectional design, which does not permit causal conclusions. Regardless of these limitations, the findings of the current study are supported by other credible studies including those by Rohrer, *et al.* (2004), Strine, Balluz, Chapman, Moriarty, Owens, and Mokdad (2004), and Ford, *et al.* (2001).

Researchers might examine responses to these items together with psychometrically evaluated measures so greater detail on the associations among several other lifestyle factors, such as sleeping patterns, alcohol consumption, and eating behaviors, and self-reported mental health could be included. Then, it might be possible to reconfigure the health education programs which were designed to change health behaviors so more effective strategies could be devised to assess specific mental health behaviors as outcome variables. This could form an appropriate basis for evaluating whether there is a direct, causal relationship between lifestyle and mental health as is essential for effective public health programs. These present findings encourage the further specific research required to construct sound programs to assess self-reported mental health outcomes along with changes in lifestyle.

REFERENCES

- CENTERS FOR DISEASE CONTROL AND PREVENTION. (2000) *Measuring healthy days*. Atlanta, GA: Author.
- FORD, E. S., MORIARTY, D. G., ZACK, M. M., MOKDAD, A. H., & CHAPMAN, D. P (2000) Self-reported body mass index and health-related quality of life: findings From the Behavioral Risk Factor Surveillance System. *Obesity Research*, 9, 21-31.

- IDLER, E. L., & BENYAMINI, Y. (1997) Self-rated health and mortality: a review of twenty-seven community studies. *Journal of Health, and Social Behavior*, 21, 21-37.
- MORIARTY, D. G., & ZACK KOBAN, M. M. (2003) The Centers for Disease Control and Prevention's healthy day measures population tracking of perceived physical and mental health over time. *Health and Quality of Life Outcomes*, 1, 37.
- PIJLS, L. T., FESKENS, E. J., & KROMHOUT, D. (1993) Self-rated health, mortality, and chronic diseases in elderly men: a Zutphen study, 1985-1990. *American Journal of Epidemiology*, 138, 840-848.
- ROHRER, S. E., PIERCE, S. R., & BLACKBURN, C. (2004) Lifestyle and mental health. *Preventive Medicine*, 40, 438-443.
- STRINE, T. W., BALLUZ, L., CHAPMAN, D. P., MORIARTY, D. G., OWENS, M., & MOKDAD, A. H. (2004) Risk behaviors and healthcare coverage among *adults* by frequent *mental* distress status, 2001. *American Journal of Preventive Medicine*, 26, 213-216.
- WILLIAMSON, D. A., & O'NEILL, P. M. (1998) Behavioral and psychological correlates of obesity. In G. A. Bray, C. Bouchard, & W. P. T. James (Eds.), *Handbook of obesity*. New York: Marcel Dekker. Pp. 129-142,