

Research Article

Relationship between general mental health and physical activity levels in young-adult male veterans

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ABSTRACT

Purpose: Little is known about the relationship between physical activity and mental health for veterans outside of outcomes for medical conditions. Therefore, the purpose of this study was to assess relations between mental health and physical activity in young-adult male veterans without activity limitations in the general population.

Methods: This cross-sectional analysis used combined state data from the 2017 BRFSS for male veterans and ages 18-34 (N=596) from California, Florida, Kansas, Texas, Virginia, and Washington. Ordered logistic regression analyses were conducted to assess the relationship between general mental health status and recommended physical activity levels after controlling for health-related, demographic, and socioeconomic factors.

Results: In this study, 28% of young adult male veterans reported low or moderate mental health and 42% reported not meeting recommended aerobic or strengthening physical activity levels. After controlling for all other variables in the model, the adjusted results indicated that meeting recommended aerobic or strength training physical activity levels were positively related to higher levels of mental health for young adult male veterans (OR=1.86, 95% CI; 1.06, 3.27).

Conclusion: Overall, about one-quarter of young-adult male veterans may self-report low or moderate general mental health status and over one-third not meeting recommended physical activity levels, and because they may be moderately related, providers should assess and address these issues concurrently.

Keywords: mental health, physical fitness, exercise, veterans, young adult

Introduction

Research shows that physical activity is related to mental health and that physical activity may promote positive mental health in adults [1-3]. However, only up to 33% of adults in the general population meet recommended levels of aerobic or strength training activities [2,4] Moreover, both mental health and physical activity are impacted by similar factors. These factors include physical health status, substance use, demographic factors, and socioeconomic status [5-7].

Mental health in veterans is a serious concern with estimates of mental health issues affecting up to two-thirds of veterans [8]. However, much of the veteran mental health research uses Veteran Administration data to assess post-traumatic stress disorder and military-related factors. There is much less focus on general mental health status for veterans back in their communities [8]. Furthermore, most research assessing the impact of physical activity with veterans is related to rehabilitation of injury or activity limitations, with little emphasis on the impact on overall

wellbeing [9]. Therefore, the purpose of this study was to assess relations among general mental health status and recommended physical activity levels in young-adult male veterans without activity limitations from general population samples.

Methods

Design: This cross-sectional analysis used data from the 2017 Behavior Risk Factor Surveillance System conducted by the Centers for Disease Control and Prevention (CDC) [10]. The objective of BRFSS is to accumulate data by state from U.S. residents ages 18 and older regarding health-related risk behaviors, chronic health conditions, and use of preventative services [11]. BRFSS data is collected annually via telephone surveys obtained from random digit dialing and is then compiled and de-identified by the CDC to allow researchers to conduct secondary data analysis. This study was given exempt status by Institutional Review Board of the University of North Texas Health Science Center.

Sample: The samples for this study included male veterans ages 18-34 (N=596) including California (n=101), Florida (n=129), Kansas (n=126), Texas (n=76), Virginia (n=85), and Washington (n=79) who (1) “ever served on active duty in the United States Armed Forces, either in the regular military or in a National Guard or military reserve unit,” (2) reported no activity limitations, and (3) had data for mental health and physical activity.

Data: The outcome, mental health, was reversed from the original measure of “low,” “moderate,” and “high” number of “bad” days in which participants experienced “stress, depression, and problems with emotions” during the last 30 days to reflect “low,” “moderate” and “high” number of “good” mental health days in the past 30 days. The factor of interest, physical activity, was derived from combining two BRFSS variables for meeting recommendations for aerobic (i.e., reported 150+ minutes or vigorous equivalent) and strengthening (i.e., reported 2+ times per week) activities in the last 30 days to represent “met neither,” “met aerobic or strength,” or “met both.”

Analysis: Using STATA 15.1, ordered logistic regression was conducted to estimate the relationship between the ordinal outcome (low, moderate, high mental health) and the set of categorical and dichotomous independent variables (including the categorical factor, physical activity). The resulting proportional adjusted odds ratio (AOR) for each factor applies to the odds of reporting “high” versus “moderate” or “low” mental health as well as to the odds of reporting “high” or “moderate” versus “low” mental health. Observations with missing data were excluded from adjusted analysis.

Results

Participant characteristics: Table 1 lists participant characteristics for young-adult male veterans. Over one-fourth of veterans ages 21 to 34 reported low or moderate mental health and over one-third reported not meeting aerobic or strengthening physical activity recommendations. For health-related factors, most reported good physical health, alcohol

Table 1: Participant characteristics (N=596)

Variable	N	%
Mental Health	596	
Low	52	9
Moderate	112	19
High	432	72
Physical Activity	596	
Met neither	250	42
Met aerobic or strengthening	164	28
Met both	182	31
Physical Health	593	
Good in last 30 days	451	73
Not good on one or more days	142	27
Alcohol Use	586	
Yes	446	76
No	140	24
Tobacco Use	592	
Yes	107	18
No	485	82
Education Level	594	
Graduated college	174	30
Did not graduate college	420	70
Employment Status	575	
Employed	432	86
Not employed	87	14
Income Level	538	
\$0 to less than \$25,000	76	14
\$25,000 to less than \$50,000	206	38
\$50,000 or more	256	48
Marital Status	591	
Married	275	47
Not married	316	53
Race/Ethnicity	578	
White	400	69
Non-white	178	31
State	596	
California	101	17
Florida	129	22
Kansas	126	21
Texas	76	13
Virginia	85	14
Washington	79	13

use, and no smoking. For demographic factors, most did not graduate college, were employed, and made over \$25,000 per year. In addition, about half were married and most reported white race/ethnicity.

Adjust results: As shown in Table 2, the results of ordered logistic regression analysis for young-adult male veterans indicated that mental health was significantly related to physical activity after controlling for physical health, alcohol use, tobacco use, education level, employment status, income level, marital status, race/ethnicity, and state. Participants who reported meeting physical activity recommendations for aerobic or strengthening activities were about 2 times more likely to report each successive level of mental health compared to those who reported meeting no physical activity recommendations. However, meeting both aerobic and strengthening activities

Table 2: Adjusted results^a

Predicting Mental Health (low vs moderate vs high)	AOR	95% CI	
		Low	High
Physical Activity			
Met neither	ref	-	-
Met aerobic or strengthening	1.86	1.06	3.27
Met both	1.47	0.84	2.55

Note: ref: referent group; AOR: adjusted odds ratio; 95% CI: 95% confidence interval; AORs with 95% CI that pass through 1.0 are not significant; model controlled for physical health, alcohol use, tobacco use, education level, employment status, income level, marital status, race/ethnicity, and state

was not related to mental health (Table 2) and neither was performing any amount of physical activity (not shown; yes vs. no 95% CI included 1.0).

Discussion

Overall, about one-quarter of young-adult male veterans reported current general mental health issues and over one-third reported currently not meeting recommendations for either aerobic or strengthening activities. Adjusted results indicated that those who met either aerobic or strengthening recommendations were about two times more likely to report each successive level of mental health. Our results are consistent with those of prior research showing inverse relations between physical activity and depression, anxiety, and health-related quality of life in the general population [1-3], and to the well-being of veterans with post-traumatic stress disorder (PTSD) or physical disabilities [9].

However, much research purports that any level of physical activity may promote good mental health [1], while our results indicated that only meeting recommended levels of either aerobic or strength training were related, but “any” levels or meeting both sets of recommendations were not. A review by Paluska and Schwenk [2] similarly concluded that aerobic and strength/flexibility training appear equally effective for mental health but doing both does not necessarily, suggesting there may be differing levels of “overtraining” or dissimilar resulting psychological and physiological processes in different subgroups [2]. Future research should focus on the beneficial levels of physical activity on mental health for various subpopulations so that providers may be better prepared to assess and address them for different groups of people. Because of moderate relations for young-adult male veterans in the general population, providers should assess and address general mental health and meeting recommendations for either aerobic or strength training activities concurrently in this target population.

Although the use of 2017 BRFSS data provided multi-state samples of young-adult male veterans in the general population, our mental health measure did not address the severity or management of any issues or medication use, both of which could impact physical activity or its relationship with mental health. In addition, our physical activity measure relied on self-reported time in specific exercise activities and did not include every day or work-related physical activity. Future research should include measures of energy expenditure throughout the day when assessing and addressing physical activity levels [1].

Conclusion

Overall, about one-quarter of young-adult male veterans may self-report low or moderate general mental health status and over one-third not meeting recommended physical activity levels. Because mental health and meeting recommended physical activity levels may be moderately related, providers should assess and address these issues concurrently, with the caveat that moderate physical activity may be more important than any physical activity.

Disclaimers

No author has any conflict of interest.

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References

- Mammen G, Faulkner G (2013) Physical activity and the prevention of depression: A systematic review of prospective studies. *Am J Prev Med* 45: 649-657.
- Paluska SA, Schwenk TL (2000) Physical activity and mental health: current concepts. *Sports Med* 29: 167-180. [Crossref]
- Bize R, Johnson JA, Plotnikoff RC (2007) Physical activity level and health-related quality of life in the general adult population: A systemic review. *Prev Med* 45: 401-415.
- Centres for Disease Control and Prevention (CDC) (2018) Physical activity guidelines for Americans. <https://www.cdc.gov/physicalactivity/downloads/trends-in-the-prevalence-of-physical-activity-508.pdf>
- <https://www.cdc.gov/mentalhealth/learn/index.html>
- Lund C, Brooke-Summer C, Baingana F, Baran EC, Breuer E, et al. (2018) Social determinants of mental disorders and the sustainable development of goals: A systematic review of reviews. *Lancet Psychiatry* 5: 357-369.
- Trost SG, Owen N, Bauman AR, Sallis JF, Brown W (2002) Correlates of adults' participation in physical activity: Review and update. *Med Sci Sports Exerc* 34: 1996-2001.
- Oster C, Morello A, Venning A, Redpath P, Lawn S (2017) The health and wellbeing needs of veterans: a rapid review. *BMC Psychiatry* 17: 414. [Crossref]
- Caddick N, Smith B (2014) The impact of sport and physical activity on the well-being of combat veterans: a systemic review. *Psychol Sport Exerc* 15: 9-18.
- Centres for Disease Control and Prevention (CDC) (2018) Behavioral risk factor surveillance system.
- Centres for Disease Control and Prevention (CDC) (2017) BRFSS prevalence & trends data.

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