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RESEARCH ARTICLE

Physical Activity Mode and Mental Distress in Adulthood

Christopher N. Sciamanna, MD,[1,2] Joshua M. Smyth, PhD,[3] Shawna E. Doerksen, PhD,[4] Barrett R. Richard, BS,[1] Jennifer L. Kraschnewski, MD, MPH,[1,2] Andrew J. Mowen, PhD,[5] Benjamin D. Hickerson, PhD,[6] Liza S. Rovniak, PhD, MPH,[1,2] Erik B. Lehman, MS,[2] Chengwu Yang, MD, PhD[2,7]

Introduction: Nearly one fifth of American adults suffer from mental health issues, yet many treatments have side effects and stigma attached. Physical activity can be an effective treatment for mental health disorders, but most promotion efforts fail. One understudied aspect of physical activity is the specific mode, including if it engages others, and how this may relate to mental health. This study examined the potential relationship between different modes of physical activity and the frequency of mental distress.

Methods: Data from the 2000 Behavioral Risk Factor Surveillance System were analyzed in 2015 to determine the relationship between participation in different modes of physical activity and frequent mental distress.

Results: Data were obtained on physical activity and frequent mental distress from 183,341 adults (aged 18–99 years, 51.9% female, 57.4% overweight/obese, 9.5% frequent mental distress). Prevalence of mental distress for those reporting activities was contrasted against walking alone. People who participated in tennis had 46% lower odds (95% CI=0.35, 0.84) of frequent mental distress. Approaching significance, non-team play sports were associated with 18% lower odds (95% CI=0.66, 1.01) of frequent mental distress, compared with walking alone.

Conclusions: Activity modes are associated with mental health outcomes above and beyond the frequency and duration of activity. Given the social and play nature of the activities, this may reflect the relational aspect, enjoyment, or a combination of both. These results suggest that adding social or affective components to physical activity may enhance engagement and retention in activity promotion efforts and their benefits on mental health.

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INTRODUCTION

Recent prevalence data estimate that 18.5% (43.8 million) of American adults have a mental, behavioral, or emotional disorder. Additionally, 4.2% (10 million) American adults have a serious mental illness resulting in functional impairment.[1] Mental health impairments are associated with multiple health risks, including increased prevalence of cardiovascular disease,[2] decreased use of medical services, and premature death.[3] People with serious mental illness have significantly shorter life expectancies than the general population.[4] The economic cost of mental health disorders is estimated at $57.5 billion each year.[5] Effective treatment

From the [1]Department of Medicine, Penn State Milton S. Hershey Medical Center, Penn State College of Medicine, Hershey, Pennsylvania; [2]Department of Public Health Sciences, Penn State College of Medicine; Pennsylvania State University, State College, Pennsylvania; [3]Department of Biobehavioral Health, Pennsylvania State University, University Park, Pennsylvania; [4]SDC Insights, LLC, State College, Pennsylvania; [5]Department of Recreation, Park and Tourism Management, Pennsylvania State University, University Park, Pennsylvania; [6]Department of Community and Therapeutic Recreation, University of North Carolina at Greensboro, Greensboro, North Carolina; and [7]Office for Scholarship in Learning and Education Research, Penn State College of Medicine, Hershey, Pennsylvania

Address correspondence to: Christopher N. Sciamanna, MD, Penn State Hershey Internal Medicine—West Campus, West Campus Health Clinic, Campus Drive, 500 University Drive, Hershey PA 17033. E-mail: cns10@psu.edu.

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of mental health disorders is essential to decrease the effects and costs of poor mental health on society.

Physical activity, or body movement resulting in caloric expenditure above resting rate,[6] may be an effective treatment for mental health disorders. Components of physical activity include intensity (i.e., amount of exerted effort), duration (i.e., amount of time engaged in activity), frequency (i.e., how often the activity is done), and mode (i.e., the type of activity). Exercise is a subset of physical activity that is deliberate, with the expected outcome of increased physical fitness.[6] Aerobic physical activity has been found to be as effective as pharmacologic treatment of major depressive disorder.[7] A recent Cochrane review and meta-analysis noted that physical activity improves mental health.[8,9] Moreover, activity offers the benefit of minimal side effects and little treatment-associated stigma. Physical activity has also been found to protect against anxiety, depression, and distress in adults without clinical mental health disorders.[6]

Despite the importance of physical activity in the treatment/prevention of mental health problems (in addition to other health outcomes), fewer than 10% of adults meet American Heart Association and American College of Sports Medicine activity guidelines (i.e., at least 150 minutes of moderate-intensity activity, 60 minutes of vigorous-intensity activity, or a combination thereof).[10–12] Often, interventions attempt to increase personal efficacy or decrease barriers associated with activity by focusing on simpler activities (mainly walking) and encouraging active lifestyles. However, many interventions fail to change behavior or maintain that change.[13] One potential reason for these failures is a relative underappreciation for the affective and social processes (e.g., enjoyment) that drive participation in certain behaviors.

The PERMA behavioral model[14] highlights the affective component of motivation for behavior. Seligman and colleagues[14] posit that humans pursue activities that provide positive emotions, engagement, relationships, meaning, and accomplishment. That is, people are more likely to engage in activities that increase positive affect, allow for absorption within the activity, provide connection with others, allow the individual to be part of something bigger, and give an opportunity to reach goals. Viewed through this lens, physical activities that people would pursue the most would be ones that were fun, create enjoyment, and were social. This model also suggests that social physical activities may have mental health benefits beyond the anxiolytic effect of aerobic physical activity alone, given the importance of relationships to mental well-being. In support of the PERMA model, perceived enjoyment of physical activity has consistently been predictive of physical activity levels.[15,16] Furthermore, results from the Scottish Mental Health study showed differential effects on mental health based on activity mode, with sports being the strongest.[17] This study was designed to extend these findings and examine a broader range of activities and their relationship with mental health.

Using data from the Behavioral Risk Factor Surveillance Survey (BRFSS), the relationship between activity mode and mental health outcomes was examined. It was hypothesized that sport or team-based physical activities would be more highly related to positive mental health outcomes than activities that are primarily exercise based and do not require social interaction (e.g., walking).

METHODS

This analysis was conducted during 2015 using data from BRFSS, a cross-sectional national survey, collected by state health departments in collaboration with the Centers for Disease Control and Prevention. Details about the sampling and methodology are published elsewhere.[18] Briefly, telephone interviews were conducted with a random sampling of adults in each of 50 states plus the District of Columbia, Puerto Rico, and the Virgin Islands. The majority of states used disproportionate stratified sampling. Puerto Rico employed a simple random sample and Minnesota used the Mitofsky–Waksberg design.[19]

Measures

Data from the 2000 BRFSS were analyzed, as that year asked participants to name specific activity modes (e.g., basketball) rather than just intensity (e.g., vigorous). Participants were asked: *What type of physical activity or exercise did you spend the most time doing during the past month?* and *What other type of physical activity gave you the next most exercise during the past month?*, providing their two most common activities.[20] Participants provided frequency and duration of participation to allow categorization of each participant's total physical activity using standard categories used in BRFSS at the time: none (no activity), irregular ($<$20 minutes or fewer than three times/week), regular ($\geq$20 minutes, three or more times/week, $<$50% capacity), regular and vigorous ($\geq$20 minutes, three or more times/week, 50% capacity).[21] Fifty-six physical activities were included. This analysis focused on the more common activities (i.e., performed by $\geq$0.3% of participants), which allowed a range of sport activities to be included, yet provided a sufficiently large sample to adjust for potential confounders. Sport activities were classified as team-based if they would traditionally be played in teams of people, and non–team-based if they did not require a team, but still had an element of game/sport involved. For the purpose of this study, the assumption that walking was done individually was made, but some walking may have been done socially. However, a social component to walking would potentially weaken estimates of the impact of team-based activities.

The dependent variable was frequency of mental distress, based on 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*