Leisure Time Physical Activity and Mental Health: Exploring the Moderating Effects of Socioeconomic Status

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Abstract
In 2016, an estimated 44.7 million U.S. adults experienced a diagnosable mental illness (National Institute of Mental Health, 2017). A number of clinical and epidemiological studies have found that leisure time physical activity (LTPA) plays a significant role in reducing symptoms of depression and anxiety. While socioeconomic status (SES) has been a focus in health research, less is known about its moderating effects on the LTPA-mental health link. Therefore, this study examined the differences in rates of mental illness among people with different levels of income, education, and LTPA. The present study further explored the moderating effects of income and educational attainment on the relationship between LTPA and mental illness. The data were obtained from the 2015 U.S. Health Information National Trends Survey (N = 3,677). The results of one-way analysis of variance indicated significant mean differences of scores on mental illness across different levels of income, education, and LTPA. Hierarchical multiple regression analyses showed that the association between LTPA and mental illness was significantly stronger in participants with low income than those with high income. Moreover, the effect of LTPA on mental illness was greater for less educated people than those with highly-educated people. Implications of these findings, as well as future research directions are discussed.

Key words: Leisure time physical activity, Mental health, Socioeconomic status

Introduction

In 2016, an estimated 44.7 million U.S. adults experienced a diagnosable mental illness (National Institute of Mental Health, 2017). This represents 18.3% of all adults in the United States. Mental illness is defined as “health conditions that are characterized by alterations in thinking, mood, or behavior (or some combination thereof) associated with distress and/or impaired functioning” (U.S. Department of Health and Human Services, 1999, p. 5). Multiple risk factors for depression exist including, smoking (Sanderson-Cox et al., 2005), early onset alcohol consumption (Trim, Schuckit, & Smith, 2010), physical inactivity and obesity (Ten Hacken, 2009), and poor sleep (Coulombe, Reid, Boyle, & Racine, 2010; Moreh, Jacobs, & Stessman, 2010). While many pharmacological interventions or alternative therapies are typically suggested, physical activity in particular has shown positive effects on mental health (Callaghan, 2004). For example, a number of clinical and epidemiological studies have found that leisure time physical activity (LTPA) plays a significant role in reducing symptoms of depression and anxiety (e.g., Abu-Omar, Rutten, & Lehtinen, 2004; Bhui & Fletcher 2000; Dunn, Trivedi, & O’Neal, 2001; Goodwin, 2003; Lampinen, Heikkinen, & Ruoppila, 2000; Motl, Birnbaum, Jubik, & Dishman, 2004).

Socioeconomic status (SES) has also been shown...
to be associated with health behaviors (e.g., physical activity) and health status (Adler et al., 1994). SES is defined as “a composite measure that typically incorporates economic status, measured by income; measured by education; and work status, measured by occupation” (Dutton & Levine, 1989, p. 30). Although SES can be measured by various indicators, education and income are the most commonly validated measures of SES (Alder et al., 1994). Education exposes individuals to information relevant to promoting healthy lifestyle and preventing risk factors (Ross & Wu, 1995). Moreover, school provides life skills, such as self-regulation and literacy, which may in turn help with making health-promoting decisions (Glymour, Avendano, & Kawachi, 2014). Higher income and wealth are associated with better health, nutrition, housing, schooling, as well as increased access to health care services and recreation and leisure resources and facilities (Adler & Newman, 2002, Glymour et al., 2014). Taken together, it is assumed that socioeconomic disparity may have a direct impact on health disparity “because high-SES people use their money, knowledge, prestige, power, and networks to avoid such exposure [to health risk factors]” (Glymour et al., 2014, p. 19).

Despite the contributions of previous research on SES, physical activity, and health, there is still a limited understanding of the specific role of SES in the relationship between LTPA and mental illness. Although the level of LTPA may be predictive of mental health status, the beneficial impact of LTPA on mental health may not be the same and may differ by SES. Given this, there is a need to consider factors that may moderate the LTPA-mental health link to clarify for whom and under what conditions LTPA might influence rates of mental illness. Therefore, the purpose of this study was to examine the differences in the mean values of mental illness among three different groups with regard to income, education, and LTPA, respectively. This study further investigated the moderating roles of income and educational attainment in the LTPA-mental illness relation. Such information will help inform policy makers and public health professionals about how to develop techniques for prevention and intervention, or policy to reduce socioeconomic disparities in health.

**Leisure Time Physical Activity and Mental Health**

Strong evidence of a link between physical activity and mental health has been found in numerous research. Goodwin (2003) analyzed data from the National Comorbidity Survey (n = 8098) and found that those reporting regular LTPA were less likely than those who did not report LTPA to show depression and anxiety disorders. Such a cross-sectional analysis, however, is limited in its ability to determine the causal direction of the relationship between LTPA and mental illness. To address this issue, emphasis has been placed on the use of prospective or experimental research designs. For example, Jonsdottir and colleagues (2010) analyzed cohort data collected in 2004 and 2006 in western Sweden to examine the longitudinal relationship between LTPA and rates of depression. They found that people who participated in light and moderate-to-vigorous physical activity were less likely to report symptoms of depression compared to