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Assessment of physical activity in middle-aged and older adults with schizophrenia

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Abstract

Background: Regular physical activity (PA) decreases morbidity in the general population; yet, information about the amount and effects of PA in persons with schizophrenia is scant. To develop interventions to increase PA and to assess its potential benefits in this group, accurate measurement of PA is needed. The purpose of this study was to characterize PA and determine the test–retest reliability and concurrent validity of the Yale Physical Activity Scale (YPAS), a self-report measure, in persons with schizophrenia.
Methods: PA was assessed with the YPAS, a scale of motivational readiness for PA, and accelerometry in middle-aged and older persons with a diagnosis of schizophrenia ($n=54$) and in a comparison group with no known psychiatric diagnosis ($n=27$).
Results: On the YPAS measures, persons with schizophrenia reported on average 11 h per week of PA, whereas the non-psychiatric comparison group reported about 32 h per week. Only about 30% of schizophrenia subjects were classified as being regularly active relative to 62% of the comparison group on PA motivational stages of readiness. On the accelerometry measures, the schizophrenia group had lower levels of light activity than the comparison group, but there were no differences in moderate and vigorous activity or sedentary behavior. Only in the comparison group were there significant associations between YPAS and accelerometer variables. Several YPAS scores demonstrated high test–retest reliability in both groups, and concurrent validity was supported between the YPAS and PA motivational stages of readiness.
Conclusions: We found that the YPAS is a reliable measure of PA in schizophrenia for some indices. Although the YPAS demonstrated concurrent validity with other self-report measures, it did not demonstrate concurrent validity when compared to PA measured by accelerometry in persons with schizophrenia. Use of multiple measures, both subjective and objective, is recommended when assessing PA in schizophrenia.
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Keywords: Physical activity; Schizophrenia; Yale Physical Activity Scale; Accelerometry; Stage of change; Validity

1. Introduction

Sedentary behavior and physical activity (PA) are modifiable risk factors for a number of serious diseases and conditions, including cardiovascular disease, obesity,

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diabetes, and some cancer (U.S.Department of Health and Human Services, 1996). PA has also been shown to reduce symptoms, improve physical functioning and promote psychological well-being and increased quality of life for persons who have already developed chronic diseases or conditions (Mazzeo et al., 1998; Rejeski and Mihalko, 2001; Penninx et al., 2002; U.S.Department of Health and Human Services, 1996). Despite these established benefits of regular PA, the majority of U.S. adults does not engage in and maintain the recommended amount of PA (Centers for Disease Control, 2003). Specific subgroups such as lower socioeconomic status groups, older adults, and ethnic minorities are even less likely to engage in and maintain regular PA and therefore, are at greater risk for developing inactivity-related disease (Brownson et al., 2000).

Other groups at high risk for disease and disability related to inactivity are individuals with severe and persistent mental illness (SPMI) such as schizophrenia. Brown et al. (1999), found that fewer persons with schizophrenia engaged in any meaningful PA during a given week relative to persons of similar age and SES. Another study found that individuals with SPMI were less physically active compared to age–gender–race-matched individuals in the general population when assessed by self-report (Daumit et al., 2005). The reasons for reduced levels of regular physical activity in this group are multifaceted, and likely include aspects of the psychiatric disorders, side effects of medications, and lifestyle issues.

Insufficient energy expenditure through reduced PA and excessive sedentary behaviors in this population may further compound problems frequently observed in this group. Overweight and obesity were more prevalent in a community-based sample of persons with SPMI than in the general population (26% versus 18%) after accounting for age, race, and tobacco smoking behavior (Daumit et al., 2003). Moreover, antipsychotic medications have been shown to be associated with higher incidence of medical illnesses for which improvements in regular PA have demonstrated positive effects (Haupt and Kane, 2007). For example, atypical antipsychotics have been found to be associated with weight gain, glucose tolerance changes, and hyperlipidemia, which all are risk factors for diabetes and cardiovascular disease (Meyer and Nasrallah, 2003) and which all are amenable to intervention, in part, through regular PA.

Few studies have addressed accurately measuring PA or intervening to improve PA in persons with schizophrenia. Although weight control programs have been tested in this population, few experimentally evaluate PA interventions, and many only address diet and nutrition (McDevitt et al., 2005; Littrell et al., 2003; McCreadie et al., 2005; Evans et al., 2005; Menza et al., 2004). When PA is addressed, studies typically measure it using simple self-reports of time engaged in PA, usually walking (Vreeland et al., 2003). Recently, however, there have been a few reports assessing the reliability and validity of PA self-report measures in persons with SPMI. For example, Soundy et al. (2007) found high test–retest reliability (single-measure interclass coefficient (ICC)=.97) over a 4-week period for the 7-day recall measure (7-DR) (Blair, 1984) in a small group of individuals with SPMI (n=14). They also found adequate concurrent validity (Kendall's tau=0.43) between the 7-DR and total energy expenditure as measured by accelerometry (Menza et al., 2004). Similarly, Dubbert et al. (2006) found evidence for acceptable test–retest reliability (ICC, r=.84) for expended energy on the Community Healthy Activities Model Program for Seniors (CHAMPS) (Stewart et al., 2001) in a relatively small sample of outpatient male veterans with SPMI and severe impairment of psychosocial functioning (n=20). They also found a modest, but not statistically significant, correlation between energy expended measured on the CHAMPS and accelerometry (Spearman's rho=0.40). In a sample of persons with schizophrenia (n=35), Faulkner et al. (2006) assessed the reliability and validity of the International Physical Activity Questionnaire (Craig et al., 2003), a commonly used self-report PA measure in adults, and found adequate test–retest reliability (Spearman's rho=.68) and concurrent validity of 0.37 between total minutes of PA assessed on the IPAQ and accelerometry.

These studies, however, have some limitations, including small sample size and heterogenous diagnostic groups. Moreover, instruments developed for the general population have several limitations when applied to PA assessment in predominantly sedentary adults, such as those with schizophrenia. Because inactive persons engage in less intensive activities more frequently than moderate or vigorous ones and perform them on a less regular basis, their recall of PA is less accurate (Harada et al., 2001). Furthermore, accurate recall requires intact working memory and executive functioning, both of which are commonly impaired in persons with schizophrenia. Self-report measures developed specifically for less active individuals, such as the Yale Physical Activity Scale (YPAS) (DiPietro et al., 1993) circumvent some of these problems by employing prompts and cued recall and also by inquiring about light activities and sedentary behavior.

Knowledge of how to measure the full range of PA and sedentary behavior in individuals with schizophrenia