



A Systematic Review of Physical Activity Correlates in Alcohol Use Disorders



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ABSTRACT

Background: Physical activity might promote mental and physical health in persons with alcohol use disorder. Understanding the barriers and facilitators of participation in physical activity in persons with alcohol use disorder is an essential first step in order to devise effective physical activity interventions.

Objective: The present review provides a systematic quantitative review of the correlates of physical activity in people with alcohol use disorder.

Methods: Major electronic databases were searched by two independent authors from inception until June 2014. Keywords included 'physical activity' or 'exercise' and 'alcohol dependence' or 'alcohol abuse' or 'alcohol use disorders' or 'alcoholism'.

Results: Five papers evaluating 14 correlates were included. Three studies reported that alcohol dependence was unrelated to physical activity behavior, while alcohol abuse showed positive associations in 2 studies. No demographic variable was related with physical activity participation. Functional impairments and distress associated with alcohol use disorders including increased smoking rates, obesity, anxiety, depression and a lower self-efficacy may limit one's ability to be physically active. Data on social, environmental and policy related factors are currently lacking. No included study assessed physical activity levels utilizing objective measurements (e.g. pedometers, accelerometers).

Conclusion: Although the literature on physical activity correlates in persons with alcohol use disorder still is equivocal, our varied findings support the hypothesis that the participation in physical activity by people with alcohol use disorder is determined by a range of complex factors.

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Alcohol misuse is the world's third largest risk factor for disease burden and is associated with a diverse range of adverse effects on physical and mental health and premature mortality (World Health Organization, 2011). Although still preliminary, existing studies demonstrate that physical activity might promote mental and physical health in persons with alcohol use disorder (Brown et al., 2014; Karoly et al., 2013; Ussher, Sampuran, Doshi, West, & Drummond, 2004; Zschucke, Heinz, & Ströhle, 2012). For example, review findings in persons with alcohol use disorder (Zschucke et al., 2012) indicate that physical activity might reduce drinking episodes and craving, while improving psychological outcomes like depression, anxiety and sleep quality and increasing physical fitness.

There is a continuing debate about the amount (e.g., frequency, intensity, duration) of physical activity needed for the mental and physical health benefits in persons with alcohol use disorder (Brown et al., 2014; Karoly et al., 2013). Understanding the barriers and

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facilitators of participation in physical activity in alcohol use disorder is an essential first step in order to devise effective physical activity interventions. Behavioral theories, such as the social-ecological model (Sallis et al., 2006) are useful in attempting to understand the factors that influence physical activity behavior. Social-ecological models posit that multiple relevant attributes influence health behavior. These include intrapersonal (demographic, biological, psychological, emotional and cognitive), interpersonal/cultural (e.g., social support), physical environment (e.g., distance to the facilities, financial costs, enjoyable scenery), and policy (laws, rules, regulations, codes) factors (Sallis et al., 2006). Intrapersonal, interpersonal, physical environment and policy related variables have demonstrated strong associations with physical activity in patients with severe mental illness (Stubbs et al., 2014; Vancampfort et al., 2012, 2013, 2014). Specifically in previous physical activity research (Stubbs et al., 2014; Vancampfort et al., 2012, 2013, 2014), the correlates are collated according to the following categories: (a) demographic, (b) biological, (c) psychological/cognitive/emotional, (d) behavioral attributes/skills, (e) social/cultural factors, (f) physical environment, and (g) policy factors.

Although there seems to be an association between physical activity and alcohol use behavior in population-based samples (French, Popovici, & Maclean, 2009; Smothers & Bertolucci, 2001), it is unclear whether this relation extends to alcohol use disorders. Two general population-based studies identified contrasting associations between levels of physical activity and levels of alcohol consumption. French et al. found that alcohol consumption was positively related to physical activity at vigorous intensity while Smothers and Bertolucci identified an 'inverted J' association; that is, the likelihood of displaying a physically active lifestyle increased from abstinence to moderate drinking, then declined at heavier consumption. Differences in findings between both studies could be due to differences in physical activity measurements used.

More than 20% of inpatients with alcohol use disorders identify financial costs, a lack of motivation, the time required for the activity and the need for transportation as the key barriers to physical activity participation (Read et al., 2001). The participants recognized as well that engaging in regular physical activity could provide tension relief, reduce stress levels and create a more positive attitude. At the same time they suggested that fatigue and poor physical condition prevented them to participate in physical activities (Read et al., 2001). In order to elaborate and confirm such findings, quantitative research which is able to identify potential mediators and moderators of actual physical activity levels is also needed. This information can then be used to target future physical activity interventions for persons with alcohol use disorder (Baranowski, Cerin, & Baranowski, 2009).

A systematic review on physical activity correlates in persons with alcohol use disorder is however currently lacking. This is a significant gap in the rehabilitation literature, given that alcohol use disorders are associated with increased mental and physical morbidity (Conner, Pinquart, & Gamble, 2009; Gossop et al., 2007) which may result in impairments that could interfere with the ability to be physically active. In addition, physical activity is known to have a beneficial effect on the common mental health co-morbidities seen in this population, such as depression and anxiety disorders (National Institute of Clinical Health and Excellence, 2011). Moreover, physical activity is known to be as effective as medication in preventing mortality in several of the physical health problems seen in this population such as cardiovascular disease (Naci & Ioannidis, 2013). A systematic review of quantitative research of potential mediators and moderators of physical activity will provide valuable information to implement physical activity in clinical practice and will inform future research. Recently, a number of such reviews have been conducted to inform clinical practice in other populations including binge eating disorder (Vancampfort et al., 2014) and dementia (Stubbs et al., 2014).

The present review therefore systematically evaluates published quantitative studies on correlates of physical activity in persons with a diagnosis of alcohol use disorder. In addition to summarizing methods and results of these studies, gaps in the literature are identified and directions for future research are proposed.

METHODS

Data Sources and Searches

Two independent reviewers (DV and ADH) performed an electronic search of the health-related databases PubMed, CINAHL and Embase, and this from the inception of these databases until June 2014. Manual searches were also conducted using the reference lists from identified articles. The medical subject headings used were 'physical activity' OR 'exercise' AND 'alcohol dependence' OR 'alcohol abuse' OR 'alcohol use disorders' OR 'alcoholism' in the title, abstract or index term fields.

Eligibility Criteria

Inclusion criteria were as follows: (a) a diagnosis of alcohol use disorder (assessed with a structured clinical diagnostic interview), (b) participants were at least 18 years of age, (c) studies contained quantitative research and had been published in a peer-reviewed journal, and (d) the dependent variable was a measure of physical activity participation. No restriction was placed on the selection of the outcome measure or the language of the article. For cohort or intervention studies, only associations of physical activity participation with baseline data were included.

We excluded articles if the dependent variable was aerobic fitness, physical activity intention, self-efficacy, or other intermediate (non-behavioral) measures because these variables are less direct indicators of actual physical activity (Caspersen, Powell, & Christenson, 1985). Also, case reports, conference abstracts, and expert opinions were excluded.

Data Collection

Two reviewers independently extracted data from the included studies using a predetermined form. The form captured data in 6 domains including (a) gender, (b) age, (c) ethnicity, (d) alcohol use disorder status, (e) the quality of the physical activity measure, and (f) physical activity correlates.

The following categories were used to code the quality of the physical activity measure: (a) self-report with poor, unknown or not reported reliability/validity in people with alcohol use disorder, (b) self-report with reported and acceptable reliability/validity in persons with alcohol use disorder, and (c) acceptable objective measurements for people with alcohol use disorder. Objective measurements included motion sensors such as accelerometers and pedometers, combined heart rate and accelerometer devices and the doubly labeled water method (Warren et al., 2010). The acceptability of the psychometric properties of measurement tools was assessed according to recommendations from De Von et al. (2007).

In accordance with previous reviews (Stubbs et al., 2014; Vancampfort et al., 2012, 2013, 2014) the following potential physical activity correlate categories were included: (a) demographic, (b) biological, (c) psychological/cognitive/emotional, (d) behavioral attributes/skills, (e) social/cultural factors, (f) physical environment, and (g) policy factors. Variables were classified as 'related' or 'not related' to physical activity based on statistical significance, and the direction of association for related variables was identified. The detailed data tables were further analyzed (see § 2.4. and 2.5) to create tables that summarized the state of the literature on different variables.

Coding Associations With Physical Activity

A variety of statistical techniques were used to evaluate correlates, including uni-/bivariate analyses, including correlations, t-tests, and ANOVA. If both uni-/bivariate and multivariate tests were conducted, uni-/bivariate tests were reported for consistency across studies. The column 'related to physical activity' indicates, which studies reported significant associations between the variable and the physical activity measure. Direction of association is indicated with a '+' or '-'. The column 'unrelated to physical activity' indicates which studies reported non-significant associations between the variable and physical activity.

Summary Codes

A summary code for each variable was presented and calculated in accordance with the method of Sallis, Prochaska, and Taylor (2000). The summary code column contains a code to summarize the state of the literature for that variable. The percentages refer to the number of associations supporting the expected association divided by the total number of associations for the variable. Associations were coded with:

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