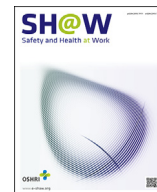




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Original Article

Beating Obesity: Factors Associated with Interest in Workplace Weight Management Assistance in the Mining Industry

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ABSTRACT

Background: Rates of overweight and obese Australians are high and continue to rise, putting a large proportion of the population at risk of chronic illness. Examining characteristics associated with preference for a work-based weight-loss program will enable employers to better target programs to increase enrolment and benefit employees' health and fitness for work.

Methods: A cross-sectional survey was undertaken at two Australian mining sites. The survey collected information on employee demographics, health characteristics, work characteristics, stages of behavior change, and preference for workplace assistance with reaching a healthy weight.

Results: A total of 897 employees participated; 73.7% were male, and 68% had a body mass index in the overweight or obese range. Employees at risk of developing obesity-related chronic illnesses (based on high body mass index) were more likely to report preference for weight management assistance than lower risk employees. This indicates that, even in the absence of workplace promotion for weight management, some at risk employees want workplace assistance. Employees who were not aware of a need to change their current nutrition or physical activity behaviors were less likely to seek assistance. This indicates that practitioners need to communicate the negative effects of excess weight and promote the benefits of a healthy lifestyle to increase the likelihood of weight management.

Conclusion: Weight management programs should provide information, motivation, and troubleshooting assistance to meet the needs of at-risk mining employees, including those who are attempting to change and maintain behaviors to achieve a healthy weight and be suitably fit for work.

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1. Introduction

Two-thirds (62.8%) of Australian adults are overweight or obese [1] and the USA and New Zealand report similar rates of obesity [2,3]. However, rates of obesity are increasing faster in Australia than in any other nation [4]. Being overweight or obese increases the risk of developing chronic illnesses such as heart disease, type 2 diabetes, and some cancers; as well as experiencing psychosocial problems such as prejudice, discrimination, and psychological distress; and may lead to increased mortality [5,6]. It has also been recognized that being overweight affects fitness for work through productivity impairments and increased work-related injury risks, particularly for occupations with high physical activity and mobility demands [7,8].

Due to the physical requirements of some roles within the mining industry, body weight and physical fitness are considered during recruitment and ongoing medical examinations are required for some mining roles. However, this does not appear to be sufficient to prevent some miners increasing their body weight to a point where it affects their fitness for work. For example, the authors have provided consultancy services to assist health and safety practitioners in situations where miners were unable to perform their work role due to an inability to fit in a workspace or needing to be reassigned to other tasks due to assessed high risk of injury associated with excessive bodyweight when performing planned work tasks. The mining industry has the highest proportion (76%) of overweight and obese employees in Australia [9]. Several characteristics of employees and their roles in mines are predictive of higher body mass index (BMI) values. Higher than average rates of

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obesity have been found for men [10] and people residing in regional and remote Australia [11]. Furthermore, mining jobs include shift work [12], which has also been identified as a risk factor associated with obesity. The high prevalence of overweight and obesity and the associated reductions in fitness for work suggests that a workplace assistance strategy may be required to help overweight employees with reaching a healthy weight. Currently, a gap exists in the literature and research is required to identify predictors of engagement in workplace weight management assistance programs in industries associated with elevated health risks such as mining.

Workplaces present an effective setting for health promotion efforts as they give access to large groups of people and have a natural social network to support behavior change [13,14]. A meta-analysis by Verweij et al [15] examined 43 studies and found modest evidence for the effectiveness of workplace weight-loss programs that target physical activity and nutrition, or a combination of both, and recommend the use of these interventions by organizations.

To assist health and safety practitioners in developing workplace weight management programs that will attract employees, this research seeks to identify predictors of employees' preference for assistance. Although characteristics have not been researched specifically with regards to miners, employee characteristics have been researched across other workforces. Previous health promotion research has found that older employees were more likely to participate in health screening, fitness testing, and educational activities [16], whereas younger employees were more likely to participate in exercise activities [17]. Regarding sex, research has typically found that women have higher participation rates in workplace health promotion programs, except for when programs provided access to fitness facilities [14]. Further, it has been found that women are more likely to intend to increase physical activity [18] improve dietary behaviors and lose weight [19].

Although some research has found that blue-collar employees participated in less leisure-time physical activity than professional employees and white-collar employees [20], the authors are unaware of any research that has investigated whether work characteristics are associated with preferences for workplace weight loss assistance. Regarding health, research has found that lower self-reported health [19] and higher BMIs [19,21] were associated with increased interest in weight-loss.

In addition to demographics, work, and health characteristics as potential predictors of preference for assistance, it is hypothesized that employee readiness for health change may be associated with preference for assistance with reaching a healthy weight. For example, if an employee is not aware that they are at risk of poor health due to their unhealthy weight, they may be unlikely to seek assistance for healthy weight management. Research has identified that individuals typically progress through a series of stages as they modify their behavioral habits [22–24]. Several models have been developed to explain behavioral change progression including the transtheoretical model [22,23], the theory of planned behaviors [25], and the health belief model [26]. Of these models, the transtheoretical model has been well validated in the literature [27] and allows for concise assessment of an individual's stage of readiness for change. The Transtheoretical Model outlines stages of change representing a process that occurs over time as an individual moves from having little or no awareness of a need to change a behavior, to considering and planning a behavior change, through to changing and then maintaining a behavior [22,23]. Research has identified that workplace health promotion messages tailored to employees' stage of readiness for change have been found to be effective in increasing physical activity [28]. However, further research is needed to investigate if employees' stages of readiness for change

are associated with overweight employees' preferences for workplace weight loss assistance.

After reviewing determinants of participation in workplace nutrition and physical activity programs, Robroek et al [14] recommended that the content of health promotions should be tailored to the characteristics of an employee population. Consistent with this recommendation, the current research aims to explore factors that predict employee preference for a workplace weight loss assistance program within a remote mining workforce. This research will build on previous workplace health promotion studies by examining which demographics, work, and health characteristics, and stages of change variables are associated with a higher likelihood of preference for assistance with reaching a healthy weight by mining employees who are overweight or obese. Identifying predictors of employee preference for assistance can improve the tailoring of workplace weight management programs, potentially benefitting the health of employees, improving organizational productivity, and reducing the burden of weight-related chronic illnesses on health systems.

2. Materials and methods

2.1. Participants

Participants were drawn from two mining sites in Australia, including both employees and contractors. Data were collected from 897 participants. The sample demographics were similar to the organizational workforce with regards to age and sex. Research participants were aged 17–73 years (mean, 39.9 years) and 73.7% were male.

2.2. Materials

To facilitate comparisons with existing population data, questions for the current research were selected and developed based on established health survey questions [29,30]. Participants were asked to provide demographic, work, and health data as well as readiness for healthy weight behavior change. Demographic questions asked participants to specify their age and sex. Work characteristics questions asked participants to select their appropriate category of roster (including permanent day shift or alternating day and night shifts) and category of work unit. Categorical response options for work unit varied depending on the mine site. Three representatives from the mining organization and two organizational psychologists with expertise in research collaboratively coded the many work units into two job types comprising trade-based jobs (e.g. underground mining or surface processing) and office-based jobs (e.g. management or administration). Health questions included a measure of general health and BMI. To facilitate benchmarking with existing Australian data, self-perceived general health was measured by asking *In general would you say that your health is excellent, very good, good, fair or poor?* Responses were scored on a five-point scale ranging from excellent to poor. BMI was calculated from participants' self-reported height and weight, using the standard method of classifying individuals as underweight (BMI < 18.5 kg/m²), healthy (BMI 18.5–24.9 kg/m²), overweight (BMI 25–29.9 kg/m²), or obese (BMI > 30 kg/m²) [25].

To measure stage of change, participants were asked to select one of five nutrition statements and one of five physical activity statements. The statements were developed based on the transtheoretical model stage of change descriptions and example items from Prochaska et al [31]. The statements matched the five stages of precontemplative, contemplative, preparation, action, and maintenance. For example, nutrition stage of change was measured by the selection of one of the following statements: precontemplative

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