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Review Paper

A systematic review of tobacco use among adolescents with physical disabilities

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ABSTRACT

Objective: To provide a systematic review of tobacco use among adolescents with physical disabilities.

Study design: A systematic review.

Methods: A search was performed of English articles published prior to December 2014 in the PubMed database for studies examining smoking rates among adolescents with and without physical disabilities. Ten studies were retrieved (all cross-sectional surveys) of which six compared adolescent populations from nationally representative samples and four examined those based on convenience sampling. Pooled analyses of smoking rates by disability status were performed.

Results: In studies from nationally representative samples ($n = 6$ studies), adolescents with physical disabilities were significantly more likely to use tobacco as compared to adolescents without (pooled analyses = 29.7% vs 23.3%). However, in studies from non-representative samples, adolescents with physical disabilities were less likely to use tobacco as compared to adolescents without (pooled analyses = 22.7% vs 39.1%).

Conclusions: Adolescents with physical disabilities may have an increased risk of tobacco use relative to those without disabilities. Tailored tobacco use prevention and cessation strategies may be appropriate for this high-risk population. Future longitudinal studies which determine factors associated with tobacco use among adolescents with different disabilities should be considered to reduce the disproportionate tobacco use in this population.

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Introduction

Worldwide, an estimated five million deaths are associated with tobacco use annually and this number is expected to grow to more than 10 million in a couple of decades.¹ At

increased risk for future morbidity and mortality are the 9.5% of adolescents globally who smoke on a regular basis.² It is estimated that 150 million adolescents worldwide use tobacco³ and every day there are between 82,000 and 99,000 young people starting to smoke worldwide.⁴ Annually in the

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US, tobacco use is responsible for 443,000 premature deaths, an estimated 5.1 million years of potential life lost, and \$96.8 billion in productivity losses.⁵

Tobacco use is acknowledged as a pediatric disease that requires serious attention because nearly 80% of smokers begin using tobacco in childhood or adolescence.⁶ Among adolescents, tobacco use is associated with risks for respiratory illnesses and cardiovascular diseases,^{7,8} addiction to other drugs,⁹ mental disorders and suicide.¹⁰ Long-term health consequences of adolescent tobacco use are reinforced by the fact that most adolescents who smoke regularly continue to smoke throughout adulthood.¹¹ With the increasing understanding of the determinants of tobacco use among high risk youth (for example see reviews on adolescents with mental illnesses¹² and studies on sexual minorities),¹³ it is important to examine youth with physical disabilities.

Based on the International Classification of Functioning, Disability and Health, disability is a term that broadly defines impairments, activity limitations, and participation restrictions that can result from personal and environmental factors.¹⁴ Aside from the usual challenges of adolescence, those with physical disabilities are at greater risk for drug use issues, mental disorders and suicide as compared to those without physical disabilities.^{15,16} In fact, despite the decreasing rates of tobacco use in the general population, there has been little change in tobacco use among those with disabilities.¹⁷ Hence, addressing tobacco use, among adolescents with physical disabilities is a pressing issue.

The purpose of this study is to review the extant literature to determine the associations between tobacco use and physical disabilities among adolescents. Our review will focus on tobacco use behaviors and potential differences in such behaviors among girls and boys with physical disabilities. The results of our review will be important in identifying research gaps and generating research questions for examining smoking among youth with physical disabilities.

Methods

This systematic review was conducted in compliance with the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines.¹⁸ A comprehensive search of the PubMed database was conducted using the following keywords: Adolescent OR Teen OR Children AND Disability OR Handicap AND Smoking OR Cigarette use OR Tobacco use. The search was limited to English language articles that addressed physical disabilities and tobacco use among adolescents and were published prior to December 2014. A hysteronomic search of the references of relevant articles was further conducted. Selection criteria for articles included those that employed a quantitative research methodology with clearly specified definitions of disability and tobacco use. Studies were excluded if they assessed only cognitive, learning or behavioral disabilities, or examined short-term disabilities,^{19–21} or did not examine tobacco use as the primary outcome,^{22,23} or did not have a non-disability comparison group.^{24,25} In addition, only studies that included children and adolescents below the age of 18 years were considered eligible.

Applying the key word search terms initially obtained 1543 hits. A total of 24 studies were eligible based on inclusion/exclusion criteria. However after removing duplicates and examining the references of the initially retrieved articles, 10 studies were eligible for our review. Due to the heterogeneity in the definitions of physical disabilities and tobacco use in the studies, meta-analytic techniques could not be fully performed. However, pooled rates of smoking among adolescents with and without physical disabilities from the selected studies was performed. To facilitate our pooled analyses, we have further grouped the results to examine tobacco use among adolescents with and without physical disabilities based on the sampling frame of the studies. Hence, studies which employed probabilistic sampling to obtain samples of adolescents are designated as studies using ‘representative’ samples of youth; whereas studies which used convenience or other non-probabilistic sampling procedures are designated as studies using ‘non-representative’ samples of adolescents. (See Fig. 1).

Results

Description of studies

The studies retrieved from the literature search represent findings from a population of 112,934 of which three studies were from populations in the US, three were from Canada, two were from Switzerland, and one each from Croatia and Australia. Table 1 presents a description of the study participants in terms of demographics, disability status, and tobacco use history. Six studies defined smokers based on smoking frequency and habits (for example frequent smoker, daily smoker, experimenter, and abstainer) and four studies assessed smoking status (yes vs no). All studies employed cross-sectional designs using questionnaires in middle and high school settings. Six studies were based on representative samples of adolescents by using cluster random sampling or probability sampling in obtaining participants;^{26–31} whereas four studies used convenience sampling to obtain participants with disabilities and compared them to those without disabilities obtained by random/cluster sampling methods or by convenience.^{32–35}

Studies using representative samples of adolescents

As compared to adolescents without physical disabilities, adolescents with physical disabilities were significantly more likely to be smokers in all six studies using nationally representative samples of adolescents. In a study among 15,856 students in the US, Blum et al.²⁶ found that adolescents who were mobility impaired were significantly more likely to be regular smokers as compared to those who were not (30.6% vs 20.2%). In a similar descriptive study with 3918 students in Australia, Hogan et al.²⁷ reported that adolescents with disabilities (physical, sensory, psychiatric, learning, developmental, and others) were significantly more likely to be regular smokers as compared to those without (14.5% vs 10.4%). Raman et al.³⁰ also found that among two groups (Grade 6 to 8 and grade 9 to 10) of Canadian students

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