

# Tobacco Use in Adolescents With Disabilities: A Literature Review

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**ABSTRACT:** The use of tobacco products by adolescents has greatly increased in recent years. Adolescents with disabilities have demonstrated higher instances of e-cigarette and tobacco use in relation to their peers without disabilities. Repercussions for e-cigarette and tobacco use increase negative physical and health implications and financial which ultimately will further the gap for individuals with disabilities over time. It is argued that adolescents with disabilities are more susceptible to begin using tobacco and remain using tobacco which can lead to further use of addictive substances. In this paper, the researcher explained the use of tobacco within the adolescent population, specifically for individuals with disabilities, the impact of tobacco use for individuals with disabilities, reviewed previous studies on tobacco use for adolescents with disabilities, points to the need for educational policy reform, and stated certain recommendations for mitigating tobacco use in adolescents with disabilities, which may result in positive future outcomes. The literature review indicated that the targeted interventions in schools or peer groups reduces tobacco use in adolescents with disabilities.

**KEYWORDS:** Individuals with disabilities, adolescents, addiction

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## Introduction

Individuals with disabilities make up a significant percentage of the youth population. In this study, disability is defined as having a functional limitation, which is measured by any self-reported difficulty in hearing, vision, cognition, ambulation, self-care, or independent living.<sup>1</sup> In the United States 2018 Disability Status Report, Erickson et al. found the overall percentage of individuals with a disability aged 5 to 15 was 5.4% while the overall percentage of individuals with a disability aged 16 to 20 was 6.3%. American Community Survey<sup>2</sup> found 21 824 088 individuals aged 15 to 19 had a disability.

Krahn et al<sup>3</sup> found overall individuals with disabilities experience reported differences in health outcomes that relates to higher rates of unmet healthcare needs, unhealthy lifestyle behaviors, mental health and chronic diseases, and social determinants of poor health. 40.3% of adults with disabilities report their health to be fair or poor than people with no disabilities at 9.9%.

As discussed in the 2018 Disability Status Report, in terms of employment, the gap between the rates of working-age people with and without disabilities was 42.2 percentage points. The difference in the median earnings between working-age people with and without disabilities who worked full-time/full-year was \$8700. The difference in the poverty rate between working-age people with and without disabilities was sixteen percentage points.<sup>1</sup> To exasperate this fact, Whitehead et al<sup>4</sup> found that smoking is a strong predictor of material hardship. Further, Siahpush et al<sup>5</sup> state tobacco use contributes to stress, and stress in turn encourages smoking.

Due to the negative impact of tobacco use, and the already lowered outcomes for individuals with disabilities, this work aims to highlight the impact of using tobacco and smoking for the over two million adolescents with disabilities. This work is a synthesis of current research which focused on specific disabilities, differences in types of tobacco use, perceptions of harm, impacts of use, and potential implications. This paper aims to provide rationale and potential supports for interventions, aimed at adolescents with disabilities, to minimize tobacco use.

## Methods

The methods for this literature review use of PubMed, Google Scholar, ERIC databases to gather the research. Keywords used included tobacco, disability, adolescents, prevalence, impact, and tobacco consumption as search terms. The major inclusion criteria initially included peer-reviewed journals only. I then broaden my search to include federal health organizations (World Health Organization and the Centers for Disease Control and Prevention) and other federal agencies who report numbers related to health and educational outcomes for individuals with disabilities (U.S. Census Bureau, U.S. Department of Health and Human Services and U.S. Department of Education).<sup>6</sup>

### *Health effects of tobacco use in adolescents*

In a review of the 2019 National Health Interview Survey, Schulz et al<sup>7</sup> found adults with any disability, mobility, vision or hearing have a higher rate of former and current tobacco use in cigarettes, e-cigarettes, pipes/hookah, and smokeless tobacco.



The negative health implications of tobacco usage have been thoroughly researched. Medicare enrollees with a disability who smoke have been shown to have lower mental and physical function than those who never smoked.<sup>8</sup> Based on the Surgeon General's report (2014), which studies the consequences of smoking over 50 years, cigarette smoking has been linked to diseases of nearly all organs of the body, diminished health status, and harm to a fetus. In addition to causing multiple diseases, cigarette smoking has many other adverse effects on the body, such as causing inflammation and impairing immune function.<sup>9</sup>

Secondhand tobacco exposure has been causally linked to cancer, respiratory, and cardiovascular diseases, and adverse effects on the health of infants and children.<sup>9</sup> Secondhand smoke exposure when people who do not smoke breathe in smoke exhaled by people who smoke or from burning tobacco products.<sup>10</sup>

However, the perceptions of harm from tobacco use in middle school and high school students varied according to tobacco products and frequency. Wang et al's<sup>11</sup> study found 54.9% of adolescents agree that intermittent use of tobacco products causes a lot of harm in cigarettes, 52.5% by smokeless tobacco products, 44.9% by hookahs, and 32.3% by e-cigarettes. Some adolescents believe little, or no harm resulted in intermittent use of electronic cigarettes (e-cigarettes) (28.2%), hookahs (16.4%), smokeless tobacco products (11.5%), and cigarettes (9.5%).

In 2017, an estimated 19.6% of high school students and 5.6% of middle school were current users of any tobacco product (ie, e-cigarettes, cigarettes, cigars, smokeless tobacco, hookahs, pipe tobacco, heated tobacco products, nicotine pouches, and bidis [small brown cigarettes wrapped in a leaf]).<sup>12</sup> In 2019, approximately 1 in 4 teens (23.0%) had used a tobacco product during the past 30 days.<sup>11</sup> As presented by The Food and Drug Administration (FDA) and CDC analyzed data from the 2022 National Youth Tobacco Survey (NYTS) in 2022, 24.8% of middle and high schoolers reported ever having used any tobacco product.<sup>13</sup> More research suggests an estimated 34.0% of high school students (5.22 million) and 11.3% of middle school students (1.34 million) reported ever using a tobacco product.<sup>14</sup>

Senders and Horner-Johnson<sup>15</sup> found that among students surveyed who indicated they had at least one disability, students with disabilities versus those without disabilities had a higher prevalence of cigarette use, e-cigarette use, and dual use of a combustible product and electronic delivery system. Gentzke et al<sup>14</sup> found e-cigarettes were the most currently used tobacco product, cited by 11.3% of high school students and 2.8% of middle school students, followed by cigarettes, cigars, smokeless tobacco, hookahs, nicotine pouches, heated tobacco products, and pipe tobacco.

As stated by the Centers for Disease Control and Prevention,<sup>16</sup> e-cigarettes are highly addictive aerosol producing nicotine and sometimes flavored inhalant that is usually has battery, a heating element, and a place to hold a liquid and are

sometimes called "e-cigs," "e-hookahs," "mods," "vape pens," "vapes," "tank systems," and "electronic nicotine delivery systems (ENDS)." Beside the addictive properties of the nicotine, e-cigarettes pose additional threats due to combustion resulting in user burns.<sup>17-21</sup>

In a review of literature, Nagarajan and Okoli<sup>22</sup> adolescents with physical disabilities may have an increased risk of tobacco use relative to those without disabilities, however, in studies from non-representative samples, adolescents with physical disabilities were less likely to use tobacco as compared to adolescents without. Casseus et al<sup>23</sup> found that compared with youths without cognitive disability, youths with cognitive disability had significantly greater odds of ever and currently using any tobacco product as well as earlier age of onset. Adolescents with mild to borderline intellectual disability ranged from 0.0% to 49.8% for tobacco use in a literature review.<sup>24</sup> Tiikkaja and Tindberg<sup>25</sup> found using tobacco were more frequent among adolescents in the disability group compared to peers with no disability, and the associations were even stronger adolescents with ADHD. Overall, McMillen et al<sup>26</sup> found that students with disabilities were at significantly higher risk for cigarette smoking, using alcohol, being overweight, feeling sad or hopeless, feeling stressed, feeling alone, and considering suicide.

Gentzke et al's<sup>14</sup> further investigated the reasons adolescents begin and maintain tobacco use. The reasons included peer use and curiosity as the most cited reasons for initiating e-cigarettes and the most cited reasons for use were attributable to feelings of anxiety, stress, or depression and the "high or buzz" associated with nicotine use."

### *Impact of tobacco use on adolescents with disabilities*

The impending behaviors and characteristics of individuals with disabilities may be intensified by the results of tobacco use. For example, nicotine can have powerful and lasting effects on the developing brain, and adolescent exposure is associated with impaired cognition, attention, memory, and mood.<sup>27</sup> If an adolescent with disabilities is already experiencing deficits in any of these areas before tobacco use, it is plausible that the gap in cognition, attention, memory, and mood will be widened through tobacco use. This gap may further impact employment, health, and academic achievement into adulthood. Reif et al<sup>28</sup> found the intricate relationships between social, economic, and health factors associated with disability are dangers for substance use, unhealthy use, and addiction. Rahmandar and Gribben<sup>29</sup> discussed the Oregon Healthy Teens survey results which indicated adolescents with disabilities had higher prevalence of cigarette use, e-cigarette use and dual use of a combustible product and an electronic delivery system as well as lower grades.

Senders and Horner-Johnson<sup>15</sup> conceptualized the higher likeliness or fair to poor mental health as a potential link between disability and tobacco use. Senders and Horner-Johnson

found that adolescents with disabilities were substantially more prone to experience stressful life events, including violence, abuse, peer pressure, or bullying, and adolescents with disabilities were also more likely to report fair to poor mental health status and poorer performance in school. Goodman and Capitman<sup>30</sup> found current cigarette smoking was the strongest predictor of developing high depressive symptoms in all models. Thus, cigarette smoking, and tobacco use may exacerbate a deficit area for adolescents with disabilities, creating further negative mental health impacts.

Several studies have found a link between individuals with disabilities and substance abuse.<sup>31-34</sup> Gentzke et al's<sup>14</sup> found adolescents provided the common response "to get a high or buzz from nicotine." This demonstrates the points made by several researchers<sup>35,36</sup> that there is a specific progression from tobacco use to further drug initiation.<sup>37-39</sup> Jensen et al<sup>40</sup> found that sensation seeking increased the risk of initiating substance use. Poelen et al<sup>41</sup> found coping motives played a main role in the associations between personality dimensions and substance use in adolescents and young adults with mild intellectual disabilities specifically in individuals high on impulsivity. Consequently, the large number of tobacco users with disabilities may indicate a higher future instance of drug use for adolescents with disabilities.

As stated by the Centers for Disease Control and Prevention,<sup>42</sup> smoking causes cancer, heart disease, stroke, lung diseases, diabetes, and chronic obstructive pulmonary disease. Forman-Hoffman et al<sup>43</sup> examined the effect of disability (sensory, mental/substance use impairment, cognitive, movement, and employment) cause-specific deaths among community-dwelling US adults, and found an increase in deaths by heart disease, chronic lower respiratory diseases, and cerebrovascular diseases (stroke). Watson et al<sup>44</sup> found the prevalence of chronic conditions such as asthma or any chronic condition is higher for individuals with disabilities. The World Health Organization<sup>45</sup> found the diseases and health conditions that are causing the most deaths are also responsible for the greatest number of healthy life-years lost (heart disease, diabetes, stroke, lung cancer, and chronic obstructive pulmonary disease). Further research is needed to investigate the correlation between adolescents who use tobacco, chronic health conditions, and cause of death, but there may be a correlation between impact of smoking and prevalence of these conditions and cause-specific death.

### Implications

In this study, we found a gap in knowledge on tobacco use and prevention among adolescents and youth with disabilities. Since the last systematic review on this topic was conducted in 2016<sup>22</sup> before the COVID-19 pandemic, an updated literature review is needed to inform researchers and policymakers. As indicated in prior studies, the use of tobacco in adolescents with disabilities can have negative educational, physical, and health impacts as they reach adulthood. Adolescents are

vulnerable to tobacco use in part due to the time gap between initial use of tobacco and the onset of tobacco-related diseases leads to a decrease in the awareness of adolescents about the harmful effects of tobacco on health.<sup>46</sup>

Researchers<sup>47-49</sup> have discussed how peer relationships play an impactful role in all adolescents' development. Within peer relationship development, research has found that individuals with disabilities are more susceptible to peer coercion.<sup>50-52</sup> Khemka et al<sup>53</sup> stated that these adolescents with disabilities might have difficulty with comprehending decision situations, applying a systematic decision-making process, generating alternative options, or predicting negative consequences of potentially dangerous decision actions. The period of adolescence for individuals with disabilities has developmental challenges including high levels of behavioral unpredictability, strong peer influence and adolescent risk-taking,<sup>54</sup> contributing to a greater susceptibility to peer influence and coercion and difficulty with social peer relationships during this period.

Interventions during adolescents must be in place to halt this tobacco use to stop the current and future harm done by tobacco consumption. As discussed by Bilgiç and Günay,<sup>46</sup> programs for developing life skills, which target tobacco use, should be designed. The programs should include instruction on how to say no, how to oppose insistence, coping with stress, anger management, and communication and problem solving. These programs may include ways for improving social capabilities, may take social response approach, or may involve school-based interventions or peer education.

Bilgiç and Günay<sup>46</sup> discussed the needed use of systematic, long term, concentrated peer education aimed at increasing the awareness of adolescents about the harms of tobacco provided by the school educators and administrators, and families to the peer groups. However, Didden et al<sup>55</sup> discussed the failure of 2 school-based interventions for adolescents with mild intellectual disability or borderline intellectual functioning due to student learning difficulties and programmatic characteristics. To combat this, since adolescents have greater peer influence, the establishment of peer groups in prevention of tobacco use could greatly benefit the vulnerable population of adolescents with disabilities in stopping the use of tobacco (Bilgiç and Günay). Khemka et al<sup>53</sup>'s research indicated that a decision-making curriculum intervention provided to adolescent participants with disabilities to enhance understanding of peer relationships and peer pressure was associated with improved self-protective decision-making outcomes.

The use of an evidence-based peer education program may benefit adolescents with disabilities in not only diminishing tobacco use but in positive decision making, self-determination, and independent living skills. As stated by Khemka et al,<sup>53</sup> focused strategy-based decision-making interventions could be a valuable addition to existing social skills interventions in the educational plans of adolescents with disabilities. Wagemaker et al<sup>56</sup> found adolescent peers can promote prosocial behavior, which is an opportunity for positive development in inclusive

(individuals with disabilities and individuals without disabilities) settings.

One way to ensure equity in the delivery of this instruction for adolescents with disabilities is to develop an educational policy to be adapted by schools to promote inclusive peer education programs in preventing and terminating tobacco use as well as decreasing risky behaviors. The urgency for these programs is apparent, as individuals with disabilities legally have access to a free appropriate public between the ages of 3 and 21.<sup>57</sup> At this time, developmental, corrective, and other supportive services required to help a child with a disability to benefit from special education are available.<sup>58</sup> Addy et al<sup>59</sup> discussed that since adolescents spend most of their time in school, promoting psychological well-being through specialized services would be most beneficial to the adolescent population. This type of program can be included by the U.S. Department of Education as supportive services to adolescents, and thus ensure all adolescents with disabilities have the supports to increase positive decision making and thus benefit health, financial status, adaptive skills, and socialization.

## Conclusion

Adolescents with disabilities are at a greater risk of future negative financial, mental, and physical health impacts due to tobacco use and addiction. Further investigation into relationships between the deficits of individuals with disabilities and the prevalence of starting and continuing tobacco use is warranted in support of narrowing the gap in outcomes for individuals with disabilities to their peers without disabilities. Lastly, further examination into evidence-based practices to support outreach efforts for adolescents with disabilities is needed.

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## Authors Contributions

The author, Melissa Wells, was the sole author in this work.

## Informed Consent

No direct participants were utilized in this study, so no informed consent was collected.

## Data Availability and Sharing Statement

I do not analyze or generate any datasets because this work proceeds within a theoretical and mathematical approach.

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