

## Review article

# Adolescent smokers and cessation: a systematic review of prevalence studies

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### Abstract

The health hazards of smoking are well documented and prevention of smoking has been described as the single greatest opportunity for preventing non-communicable disease in the world today. Teenage smoking prevalence is around 15% in developing countries and around 26% in developed countries. Recent studies provide information on the efficacy of many different smoking cessation methods, but controversy persists over what method of adolescent smoking cessation should be employed. This review article seeks to evaluate the efficacy and validity of tobacco control policies in affecting adolescent smoking behavior that may generally be made more effective if they are supported by Government agencies and advocacy groups.

### Introduction

Cigarette smoking is one of the leading causes of preventable morbidity and mortality.<sup>1</sup> Globally, there are currently 4 million tobacco attributable deaths each year, with current trends driving a rise to 10 million deaths per year by the 2030s.<sup>2</sup> An estimated 150 million adolescents worldwide use tobacco and approximately half of these young smokers will die of tobacco-related diseases in later life.<sup>3</sup> Adolescent smokers are also subject to more immediate health consequences, such as respiratory and non-respiratory effects,<sup>4</sup> changes in serum cholesterol<sup>5</sup> and nicotine dependence and withdrawal<sup>6</sup>. Although preventing the initiation of smoking remains a major goal of tobacco control, prevention programs directed at adolescents have shown limited effectiveness to date<sup>7</sup>. Moreover, once adolescents start smoking, the impact of prevention programs, whether on experimental or regular smokers, is small and inconsistent across studies<sup>8</sup>. It is estimated that adolescent adolescence have been associated with positive subjective health changes, such as improved respiratory cigarettes will continue to smoke for another 16–20 smokers who reach a consumption level of at least

100 years.<sup>9</sup> Even brief periods of smoking cessation during health and a general sense of feeling healthier, fitter and more energetic.<sup>10</sup>

Among adolescents in the early stages of smoking onset, alternating periods of smoking and abstinence are common.<sup>11</sup> Yet longitudinal studies show that only 3–12% of adolescent daily or regular smokers<sup>12</sup> and 10–46% of adolescent non-daily or occasional smokers<sup>13</sup> no longer smoke 1–3 years later. This suggests that the likelihood of achieving abstinence, although generally low, is greater if a cessation attempt occurs at lower levels of consumption. Other reports, however, provide evidence that even adolescent smokers in the early stages of smoking onset experience difficulty attempting cessation<sup>14</sup>. Indeed, symptoms of nicotine dependence, which make cessation difficult, can develop soon after smoking initiation<sup>15,16</sup>. Worldwide, about half a billion of the children and adults younger than 35 years of age already smoke or will do so if current uptake rates persist, and given current cessation patterns, relatively few will quit<sup>17</sup>. In all countries, young adults who smoke face about a decade of life lost if they continue and hence have much to gain by stopping.<sup>18</sup> Recent reviews advocate the intensification of efforts to develop and implement smoking cessation programs for adolescents.<sup>19,20</sup> In addition, the goal of increasing cessation attempts among adolescent smokers has been incorporated into a set of nationwide public health goals.<sup>21</sup> This has created a critical need to document the prevalence of cessation attempts among adolescent smokers. Therefore, the present study summarizes the measures used to estimate attempts at smoking cessation and quantifies the prevalence, frequency and duration of cessation attempts

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among adolescent smokers, generally, and according to age and level of cigarette consumption.

### **Rationale**

Long-term tobacco smoking can have adverse effects in nearly every organ of the body and cause a variety of diseases. In the United States, the adverse health effects from cigarette smoking account for more than 480,000 deaths among adults, or nearly one of every five deaths; more deaths are caused each year by tobacco use than by all deaths from human immunodeficiency virus (HIV), illegal drug use, alcohol use, motor vehicle injuries, suicides, and murders combined.<sup>22</sup> Cigarette smoking damages health because of the constituents of tobacco smoke. It contains over 4,700 chemical compounds of which about 60 are carcinogenic, and cigarette smokers' face continual exposure to them for years.<sup>23</sup> Cancer was among the first diseases causally linked to smoking. Smoking causes cancers of the bladder, oral cavity, pharynx, larynx, esophagus, cervix, kidney, lung, pancreas, and stomach, and acute myeloid leukemia. Smoking causes about 90 percent of lung cancer deaths in men and women.<sup>24</sup> Effects of second-hand smoke are particularly harmful for young children and children with asthma. It is responsible for between 150,000 and 300,000 lower respiratory tract infections among children under 18 months of age each year.<sup>25</sup> Studies in Bangladesh have shown that tobacco consumption has a direct impact on the health of poor households, with poorer people spending less on food, resulting in malnutrition. The studies have found that the typical poor smoker could add over 500 calories to the diet of one or two children with his or her daily tobacco expenditure. Applied to the whole country, an estimated 10.5 million people who are currently malnourished could have an adequate diet if money spent on tobacco were spent on food instead.<sup>26</sup> Recent studies have addressed the problem of adolescent smoking in a number of different ways. Motivation to quit smoking, as well as methods to help adolescent patients stop smoking, including smoking bans and adolescent smoking cessation programs are reviewed here.

### **Methodology**

Five types of tobacco control policies were considered that have been examined empirically and can be directly implemented by national or sub national Government agencies: (1) taxation, (2) restrictions on advertising, (3) health warning labels, (4) communicating with adolescents and their family members, and (5) school education programs to increase the utilization of cessation treatments and services. The ultimate goal of tobacco control policies is to improve health by reducing tobacco use. The predicted effects are based on reviews of the literature and the advice of an expert panel.

### **Discussion**

The majority of available evidence on smoking cessation interventions relates to adults, particularly regarding medicines. An estimate of a young person's nicotine dependence can be used to determine which cessation intervention (or combination) is most appropriate.

### **Increasing taxes**

The WHO reports<sup>27</sup> that although many countries now use non price interventions, only a few (including Mauritius, Mexico, the Philippines, Poland, and Turkey) have been using large increases in specific excise taxes on tobacco to reduce smoking.<sup>28</sup> An International Agency for Research on Cancer review of more than 100 econometric studies confirmed that tobacco taxes and consumption are strongly inversely related.<sup>29</sup> It concluded that a 50% increase in inflation-adjusted tobacco prices reduces consumption by about 20% in both high-income countries and low- and middle-income countries<sup>30</sup>. Higher taxes are particularly effective in poorer or less educated groups and help prevent young people who are experimenting with smoking from becoming regular smokers.<sup>31</sup> Smuggling is a concern when tobacco taxes rise; about 10% of all cigarettes manufactured worldwide are already untaxed.<sup>32</sup> Use of specific excise taxes on tobacco (rather than ad valorem taxes), stronger tax administration, and practicable controls on organized smuggling can, however, limit the problem.<sup>33</sup>

### **Banning advertising and sponsorship of tobacco products**

Advertising increases positive user imagery of tobacco, distorts the utility of tobacco use, increases curiosity about tobacco use<sup>34</sup> and influences normative beliefs and perceptions of tobacco use prevalence,<sup>35</sup> all predictive of future smoking experimentation. Youth exposure to tobacco marketing has been associated with a doubling of the chances of initiation.<sup>36</sup> Comprehensive bans are the only effective way to eliminate tobacco marketing exposure, as the tobacco industry subverts restrictions by substituting marketing channels are not covered by existing laws.<sup>37</sup>

Though tobacco advertising is banned throughout the European Union, China, and some other countries, cigarettes are still among the most heavily advertised and promoted products in the world, with spending on tobacco marketing reaching \$8.6 billion annually in the United States alone.<sup>38</sup> In 2011 Australia, which had already banned advertising, introduced plain packaging for tobacco products, removing all brand imagery. The brand is printed only in small standard lettering below a pictorial warning. Recent evidence suggests that plain



packaging increases cessation attempts<sup>39,40</sup> Plain packaging goes beyond the prominent, rotating pictorial warning labels on tobacco products that have helped increase cessation attempts in Canada, Thailand, and elsewhere.<sup>41</sup> Pictorial warnings can reach even illiterate persons, and half the deaths from tobacco in India occur among the illiterate.<sup>42</sup>

### Health warning labels

Warning labels have been found to inform smokers about the health hazards of smoking, encourage smokers to quit, and prevent nonsmokers from starting to smoke. Warning labels on tobacco products are an ideal way of communicating with smokers. Warning labels have the potential to have a significant impact on smoking behavior. Further, two-thirds of all smokers indicate that the package is an important source of health information and health knowledge is strongly associated with an intention to quit smoking.<sup>43,44</sup>

More than 90 percent of Canadian youth agree that picture warnings on Canadian cigarette packages have provided them with information about the health effects of smoking and make smoking seem less attractive.<sup>45</sup> An Australian study examined the impact of the introduction of graphic health warning labels on adolescents. The authors found that adolescent experimental and established smokers were more likely to think about quitting, and intentions to smoke were lower among those students who discussed the new warning labels.<sup>46</sup> A Greek study of adolescents indicates that proposed European Union pictorial warning labels were more effective at informing about the health effects of smoking and preventing initiation than the previous text only labels<sup>47</sup>.

### Communicating with adolescents and their family members

Adolescents are often concerned about confidentiality and issues relating to trust and embarrassment.<sup>48</sup> It is therefore important to stress that the confidentiality of anything the adolescent discloses will be respected. Communication with adolescents is more successful when it is perceived as being non-judgmental. Patience, good listening skills and asking open ended questions are other qualities that are valued in consultations by adolescents.<sup>49</sup> Children with parents who smoke are more likely to be the "early adopters" of smoking in their peer group.<sup>50</sup> Reducing parental smoking therefore may have a wider benefit beyond the family unit by reducing the transmission of smoking through peer groups.<sup>51</sup> Increased parental supervision or interaction may

decrease smoking. A survey of New Zealand adolescents aged 14–15 years from 145 high schools found that higher amounts of parental monitoring outside of school hours had an increasingly protective effect against adolescent smoking. It was also found that adolescents who were the least attached to their parents were more likely to smoke<sup>52</sup>.

### School education programs

More recent programs have focused on teaching life skills and about the sociopolitical climate surrounding tobacco use. Studies of school education policies at a program level yield mixed results.<sup>53</sup> Some studies find reductions in prevalence rates as high as a 50% and effects sustained as long as 5 years, but many of the better studies fail to find any long-term beneficial effect.<sup>54</sup> School educational programs may help to reinforce norms in those communities with more extensive tobacco control policies.

### Conclusion

Prevention programs can reduce the number of adolescents who initiate tobacco use and proceed through the tobacco continuum. The combination of counter-advertising campaigns, taxation to increase price, advertisement control, and enforcement of sales-to-minors laws provide a strong assortment of measures that are closely associated to the decline observed in youth smoking initiation in the last decades.

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