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Preventive Medicine

journal homepage: www.elsevier.com/locate/ypmed

Disparities in knowledge about the health effects of smoking among adolescents following the release of new pictorial health warning labels

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ARTICLE INFO

Keywords:
Adolescent
Youth
Smoking
Knowledge

ABSTRACT

This paper examined knowledge about the health effects of smoking among health equity groups following the 2012 introduction of refreshed pictorial health warning labels (HWLs) in Canada. Data are from the 2012/2013 Youth Smoking Survey a representative school-based survey of 47,203 adolescents in Grades 6–12 in nine provinces. Regression models examined overall knowledge about eight health effects of smoking included in the HWLs. Less than one-third of adolescents (32.2%) knew that smoking causes vision loss/blindness and 33.7% knew that smoking causes bladder cancer. Whereas knowledge was high for lung cancer (93.9%), knowledge about other health effects ranged from 52.9% for chronic bronchitis/emphysema to 77.6% for gum or mouth disease. Non-smoking adolescents who were: susceptible to future smoking, male, ethnic minorities, and who had less spending money were significantly less likely to be knowledgeable of the health effects of smoking. There were fewer disparities in knowledge about the health effects of smoking among smokers. Smokers who bought loose or bagged cigarettes rather than cigarettes in packages or cartons were significantly less likely to be knowledgeable about the health effects of smoking. There are significant disparities in knowledge about the health effects of smoking by health equity groups particularly among non-smoking adolescents. Warning labels have the potential to reduce disparities in knowledge about the health effects of smoking when exposure to the warning labels is universal. Complementary strategies such as mass media campaigns are needed to address disparities in knowledge.

1. Introduction

Tobacco use is the leading cause of disease and premature death worldwide (World Health Organization, 2014). Adolescence is a critical period for tobacco-use initiation (U.S. Department of Health and Human Services, 2012), and therefore a public-health priority. On average, smokers report smoking their first cigarette at age 16, and start smoking regularly at age 18 (Janz, 2012). Although youth smoking is generally declining in developed countries (Eriksen et al., 2015), differences in smoking prevalence remain among youth by gender, socioeconomic status (SES), and race/ethnicity. Smoking rates are higher among males than females (Reid et al., 2015). Individuals with lower SES smoke cigarettes at higher rates (Gupta et al., 2007; Reid et al., 2010a) and are disproportionately affected by the harms of tobacco use

(Reid et al., 2010b). In 2011, approximately 12% of youth, aged 15–17, from lower-income households were smokers, compared to 7.0% of youth in higher-income households (Janz, 2012). Adolescents with European ancestry (Asbridge et al., 2005) and Indigenous youth also smoke at higher rates (Elton-Marshall et al., 2011; Lemstra et al., 2011).

One intervention to address smoking-related health disparities is pictorial health warning labels (HWLs) on tobacco packages. HWLs have broad reach and are a major source of health information, even for non-smokers (Hammond, 2011). Therefore, they have the potential to reduce disparities in access to information about the health effects of smoking (White et al., 2008). Evidence suggests that countries with pictorial HWLs have fewer disparities in health knowledge among adults across educational levels (Siahpush et al., 2006). Thus, pictorial warnings may be more effective than text-based warnings as they do

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<https://doi.org/10.1016/j.ypmed.2017.11.025>

Received 6 July 2017; Received in revised form 13 November 2017; Accepted 26 November 2017
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Fig. 1. New HWL Introduced in 2012 in Canada.

not require the same level of literacy (Hammond, 2011). In 2001, Canada was the first country to implement pictorial HWLs on cigarette packages. Recent evidence suggests that adult smokers in Canada receive most of their anti-smoking information from HWLs on cigarette packages (ITC Project, 2013). New HWLs were introduced in Canada in 2012, and covered 75% of the front and back of cigarette packages. The warnings were rotated with equal frequency. The labels featured new warnings about tobacco-related diseases by linking smoking to bladder cancer (Fig. 1) and vision loss (Hammond, 2013).

Surveys of adult smokers have found that smokers are inadequately informed of the health effects of smoking, with lower-SES smokers being less knowledgeable (Siahpush et al., 2006). Although many adult smokers believe that smoking causes heart disease and lung cancer, fewer believe that smoking causes stroke, impotence (Hammond et al., 2006) or vision loss (Kennedy et al., 2012). In 2011, less than half of Canadian adult smokers knew that smoking causes breast cancer, bladder cancer, and blindness (ITC Project, 2013). Given that early detection is associated with more positive prognoses for these conditions, information about specific health effects of smoking is critical (Chapman and Liberman, 2005).

Existing research regarding knowledge about the health effects of smoking among Canadian adolescents is limited and largely descriptive (Chaiton et al., 2005; Morrison et al., 2005; Wong and Manske, 2007). In 2006, it was reported that 89% of adolescents knew that smoking causes lung cancer, but fewer knew that smoking causes asthma (62%) or “heart problems” (69%) (Wong and Manske, 2007). It has further been found that most smokers begin smoking prior to age 18 (Janz, 2012; U.S. Department of Health and Human Services, 2014), and that this early initiation is associated with a greater likelihood of developing tobacco-related diseases (Huxley et al., 2012). Longitudinal research has demonstrated that adolescents who perceive more long-term health risks of smoking (e.g., getting lung cancer) are less likely to initiate smoking (Song et al., 2009). Research also suggests that adolescents are less likely to intend to smoke if they are exposed to anti-smoking messages that depict smoking-related disease and suffering (Pechmann and Reibling, 2006). It is therefore critical that tobacco-control prevention strategies ensure that adolescents are adequately informed about the health effects of smoking to reduce smoking prevalence.

Given that the current generation of Canadian adolescents have grown up with pictorial HWLs, we hypothesize that they will have considerable knowledge about the health effects of smoking as depicted in the HWLs. However, no research to date has examined knowledge about these health effects among Canadian adolescents since the implementation of the updated HWLs. Based on previous research of Canadian adolescents, we expect that there will also be socio-demographic differences, such that females and those in higher grades will be more knowledgeable (Morrison et al., 2005). The current study

therefore examines knowledge about the health effects of smoking among a representative sample of adolescents in Canada following the introduction of new HWLs in 2012.

2. Methods

2.1. Study protocol

Data are from the 2012/2013 Youth Smoking Survey (YSS), a representative classroom-based survey. They were collected between November 2012 and June 2013. The target population was adolescents in Grades 6–12 attending private, public, and Catholic schools in nine Canadian provinces ($n = 47,203$). Schools on First Nation Reserves; schools in the Yukon, Nunavut and Northwest Territories; and youth living in institutions or attending special schools or schools on military bases were not sampled. Manitoba did not participate in the 2012 YSS.

Research-ethics approval for this study was obtained from the University of Waterloo and local school boards. Further details about the YSS protocol, sampling, and survey-weight construction is available (Propel, 2013).

2.2. Measures

2.2.1. Demographic variables

Respondents reported gender, grade (6–12), province, and race/ethnicity (White, Black, Asian, Aboriginal, Latin American/Hispanic, other) where a single minority group or a minority group and “White” was categorized by the minority group and two or more minority groups were “other”. Consistent with previous research (Elton-Marshall et al., 2011), spending money was measured by: “About how much money do you usually get each week to spend on yourself or to save?” (\$0, \$1–\$20, \$21–\$100, \$100 or more, “don’t know/missing”).

2.2.2. Health knowledge

Consistent with previous research (Yang et al., 2010), respondents were asked: “What health problems can people get if they smoke for many years? (mark all that apply)—asthma, premature or early death, lung cancer, heart disease, gum/mouth disease, chronic bronchitis/emphysema, bladder cancer, vision loss/blindness”. An additive index was created, ranging from 0 to 8 (higher scores indicating greater knowledge). The scale has demonstrated reliability (Cronbach’s alpha = 0.84).

2.2.3. Parent, sibling, and friend smoking

Adolescents (including non-smokers) have greater exposure to cigarette-package HWLs if they have a parent or friend who smokes (White et al., 2008). Parent/sibling/friend smoking was therefore a

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