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Tanning among Ontario adolescents pre-legislation: Prevalence and beliefs

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ABSTRACT

To establish adolescent tanning beliefs and behaviors, prevalence and location of UV tanning device (beds/lamps) use, awareness of risk and restriction signage, and frequency of tanning service refusal, noting differences by grade and sex, prior to a ban on UV tanning device use among those under 18 in Ontario, Canada.

Data were collected May 5 to 20 of 2014. Children in grades 7 to 12, and under age 18 completed an on-line questionnaire that asked their age, sex, grade, methods used to tan, frequency, length and location of UV tanning device use, if services were refused and why, awareness and content of signs/warning labels, tanning beliefs and knowledge, and use of eye protection.

Of 1561 participants (10% response rate), 49% were male, 51% female. There were significant differences between the sexes regarding tanning behaviors (e.g. not tanning, tanning outside). Seven percent (108) had 'ever' used UV tanning devices, females more than males ($p = 0.0026$). Over half (57%) of the 104 using UV tanning devices in the past 12 months noticed warning signs/labels, of which most noticed that UV tanning devices can cause cancer (65%), and that UV exposure can contribute to premature aging (67%). While most (66%) tanned at tanning salons/studios and beauty salons/studios, gyms/fitness clubs (35%) and home use were common (25%).

A relatively low proportion of adolescents used UV tanning devices prior to the ban, with use more common among females and those in higher grades.

1. Introduction

Skin cancer is the most common cancer in Canada, and its incidence is rising (Canadian Cancer Society's Advisory Committee on Cancer Statistics, 2015). Non-melanoma skin cancer (NMSC) and cutaneous melanoma together account for almost as many new cancers as breast, lung, prostate and colorectal cancers combined. It is estimated that in 2015, there were 78,300 new cases of NMSC, and 6800 new cases of melanoma in Canada (Canadian Cancer Society's Advisory Committee on Cancer Statistics, 2015). The main risk factor for skin cancers of all types is ultraviolet (UV) radiation exposure, either from the sun or UV tanning device (bed/lamp) use (Canadian Cancer Society's Advisory Committee on Cancer Statistics, 2015).

The reasons commonly given for UV tanning device use are that it prepares the skin for sun exposure, it is safe or healthy, and for a perceived improvement in appearance (Borner et al., 2009). Because the purpose of UV tanning devices is to produce a rapid, deep tan, the UV radiation emitted, while similar in wavelength distribution to that of the sun, is generally of higher intensity, and may result in received doses of UVA that are well above what one would experience outdoors (Gerber et al., 2002; Hormung et al., 2003; International Agency for Research on Cancer Working Group on Artificial Ultraviolet (UV) Light and Skin Cancer, 2006).

The International Agency for Research on Cancer added UV-emitting devices to its list of known carcinogens when it was determined that there is sufficient evidence that UV tanning device use causes melanoma, squamous cell carcinoma and basal cell carcinoma of the skin (El Ghissassi, 2009). The skin cancer risk associated with UV tanning device use is higher among those who began at an earlier age, and used them for a longer time period (Canadian Cancer Society's Advisory Committee on Cancer Statistics, 2014). A review and meta-analysis by Boniol et al. (2012) reported that sunbed use before age 35 is associated with a summary risk for melanoma of 1.59 [95% confidence interval (CI): 1.36–1.85; $p = 0.05$], and that for all ages there is an increased risk for melanoma with each session of use per year (Boniol et al., 2012). Another systematic review with meta-analysis that examined more recent (from 2000 on) studies, to capture the impact of modern tanning beds, reported a relative risk of melanoma associated with ever use of indoor tanning of 1.25 (95% CI: 1.09–1.43; $p < 0.05$)

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(McWhirter et al., 2014). The risk of NMSC associated with indoor tanning is higher with use before the age of 25 (Wehner et al., 2012).

An international systematic review and meta-analysis estimated that approximately 18% of adolescents had been exposed to indoor tanning in the past year (10% in the United States) (Wehner et al., 2014). In Canada there is a dearth of information about UV tanning device use among adolescents. An unpublished 2012 poll of almost 1500 Ontario youth, aged 12–17 found that 9% reported having ever used a UV tanning device, and that use increased with age, with 16% of those in grades 11 and 12 having used a UV tanning device (Reid, 2012). A published report by Gordon and Guenther (2009) on indoor tanning use among grade 10 students in London Ontario found ever use to be 14%, with greater prevalence of use among females (Gordon and Guenther, 2009). Unpublished reports completed in other provinces place prevalence of use among adolescent females at 16–24% and among adolescent males at 5–11% (Sun Smart Saskatchewan, 2013). To our knowledge, no other data have been published which examine UV tanning device prevalence of use among adolescents in Ontario, and there have been no other published data about young tanners in Canada in the past 15 years.

The increased risk of skin cancer and melanoma associated with early use of UV tanning devices is troubling, given that youth and young adults are the main users. In response, many jurisdictions around the world have enacted legislation to restrict use of UV tanning devices, with most focusing on banning teens, as recommended by the World Health Organization in 2003 (World Health Organization, 2003). In Canada, the regulation of UV tanning devices themselves is federal, while legislation regarding their use (age restrictions, signage, fines, parental consent, restrictions on advertising, etc.) varies by province; some municipalities have also passed by-laws restricting use.

The Skin Cancer Prevention Act (Tanning Beds) (hereafter referred to as 'Bill 30'), which regulates the sale and marketing of tanning services and ultraviolet radiation treatments for tanning in Ontario was passed on October 10, 2013 and came into effect on May 1, 2014 (Ontario, 2013). Among other things, Bill 30 prohibits the offer for sale, sale, or provision of tanning services or ultraviolet light treatment for tanning to those under 18 years of age, requires that tanning bed operators request identification from anyone who appears to be under 25 years old, and that they post signs noting the ban on minors and the health risks of tanning bed use. Prior to Bill 30, no provincial legislation restricted use; UV tanning devices were regulated through the federal Radiation Emitting Devices Act, which outlined technical requirements and required some safety labels, however, it did not restrict UV tanning device use (Government of Canada, 2005). Some municipalities in Ontario did restrict UV tanning device use among minors prior to the ban (Town of Oakville, 2012). In order to establish the effectiveness of Bill 30 over time, and to tailor prevention messages properly, more needs to be known about what adolescents understand and believe about tanning and artificial tanning, and the experiences of those who use UV tanning devices, particularly with respect to place of use, awareness of signage, and reasons for being refused service.

Immediately prior to the enactment of Bill 30, we conducted a survey of Ontario adolescents (grades 7–12 and under age 18) about their tanning behaviors, knowledge, attitudes and beliefs in order to establish a pre-Bill 30 baseline against which to measure impact. This report presents the results of this survey, with a focus on differences between males and females and across grades.

2. Methods

Ethics approval for this study was obtained through the Research Ethics Board of the University of Toronto. To rapidly bring a questionnaire to the field prior to enactment of Bill 30, the project team contracted data collection to a professional survey company, and used a method that was previously employed to obtain tanning use data from the same difficult-to-reach population for an unpublished 2012 tanning survey (Reid, 2012). Data were collected May 5 to May 20 of 2014.

Parents of children in the target demographic in Ontario, who were members of an online panel that regularly completes surveys in exchange for points that accumulate and can be redeemed for rewards, were contacted by email. The survey company used existing background information on its panelists, to identify parents with children who were both under the age of 18 and in grades 7–12.

The email described the questionnaire, study purpose and number of points to be awarded to the child for participation, and asked that the eligible child (in grades 7–12 and also under the age of 18, selected by the survey company, with the particular child requested by age) open and complete an on-line questionnaire.

Because parents were required to ask their children to participate, parental consent was implied. At the start of the questionnaire, a page described the purpose of the survey, and required that participants themselves consent by clicking a check box.

The questionnaire took approximately 15 min to complete, and included questions about demographic characteristics (age, sex, grade), asked 'which of the following ways have you ever used to get or keep a tan' (laying in the sun, being /playing outside, spray tanning booths, tanning lotions or sprays, tanning beds/lamps, tanning pills or injections – available for purchase online, but not approved by Health Canada, nor the U.S. Food and Drug Administration – or if they did not tan at all), and to respond to an eight item scale about tanning beliefs and knowledge.

Those who reported using UV tanning devices were also asked about: length and location of UV tanning device use, if they had ever been denied access to UV tanning devices and why, followed by a list of response options yes/no that included 'I am too young', 'my skin is too light', and 'I was told I am tanning too much' and a closed ended 'other' category. UV tanning device users were also asked about their use of eye protection and, if they noticed signs/warning labels, about their content. Because data for this study were collected in the early days of Bill 30 (passed in the month of data collection), users of UV tanning devices were asked about use in May, to check that they were not being refused service only then. In order to obtain a baseline understanding of what existed prior to the legislation, ten items listed possible content on signs and warning labels, which participants could click on in order to indicate they had seen it (e.g., 'those under 18 cannot use this equipment', 'some drugs and cosmetics can increase the UV effects of tanning beds and lamps'). These same questions will be asked in a follow-up survey in order to measure changes.

All participants (including those who did not use UV tanning devices) were asked 8 items on a 5 point scale about their attitudes and knowledge around UV tanning devices and tanning behaviors in general (e.g., 'people with a tan look healthy', 'using tanning beds/lamps actually helps prevent some forms of cancer').

Responses were weighted according to the age, sex and regional distribution of the Ontario population, based on the 2011 census data. Analysis was undertaken using SAS version 9.2 to estimate percentages; p values were used to test differences between subgroups using the Rao-Scott chi-squared test, which is a design-adjusted version of the Pearson chi-squared test. Logistic regression was undertaken to examine the joint effects of sex and grade on ever/never use of UV tanning devices. Data were analyzed by grade because the study purpose is to learn about the behavior of those in grades 7–12 as the peer group, imposing an upper age restriction of 18 because of the Bill. Those not in school were excluded from the sample, therefore age would not have been suitable for analysis.

3. Results

Of the 1561 youth who completed the questionnaire (approximately 10% response rate), 765 were male, and 796 were female. The school grade and sex of respondents is shown in Table 1.