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Geography, Facilities, and Promotional Strategies Used to Encourage Indoor Tanning in New York City

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Abstract

There is emerging evidence for the relationship between indoor tanning and melanoma. Eighty-five indoor tanning facilities in New York City were observed to determine number of tanning machines, pricing, promotions, products, and hours. Census data by zip code was used to determine population density, gender, race, age, percent living in poverty, percent unemployed, and percent college educated of areas in which tanning facilities were located. Pricing varied by the type of machine, number of sessions purchased, and single versus bundled sessions. Facilities were located in areas that had greater population density and slightly greater median age. Compared with the zip code areas with no facilities, those with tanning facilities had a higher proportion of white residents; a lower proportion of residents living in poverty and unemployed; and a higher proportion of residents with a college education. Our data suggest that the strategic location of facilities and promotions used in NYC seek to maximize patronage by those with comparatively high levels of income and education and who may be more influenced by the social desirability of artificial tanning. Long-term interventions aimed at changing social norms regarding tan skin are needed.

Keywords

Skin cancer; Artificial tanning; Prevention

Introduction

Rates of skin cancer have increased in recent decades, making it the most common form of cancer in the United States [1]. In 2010, more than 1 million cases of non-melanoma and

more than 68,000 cases of melanoma skin cancer will occur in the United States [2, 3]. While less than 1,000 annual deaths from non-melanoma skin cancer are expected, it is estimated that ~8,700 deaths from melanoma will occur in 2010. Estimated annual direct costs associated with treating non-melanoma skin cancer were 1.5 billion dollars [4] and among the elderly, the annual Medicare costs of melanoma were up to 249 million [5].

There is strong evidence for the causal relationship between ultraviolet (UV) radiation exposure and non-melanoma skin cancer and emerging evidence for the relationship between indoor tanning and melanoma [6]. Indoor tanning has become a multibillion dollar industry in the United States representing an avoidable source of UV exposure that may be lethal [7]. Despite the fact that UV radiation from artificial tanning beds has been considered carcinogenic [8], facilities containing them remain prevalent in the United States, especially in densely populated areas [9]. Female adolescents have been found to be the most frequent users of tanning facilities [10–12]. In a study of white adolescents in the U.S., Demko et al. [13] found that more than one-third of white females surveyed reported using a tanning salon at least once in their lifetime compared to 11.2% of white males. Compared with males, a greater proportion of females reported using tanning salons more than three or more times in the past year (28.1 vs. 6.9%) [13]. This behavior persists into adulthood as well [14, 15]. In another study, 90% of students at a Midwest university indicated awareness of the relationship between tanning and skin cancer while nearly half (47%) reported using a tanning lamp in the past year [16].

Exposure to UV radiation in childhood and the teenage years can be so damaging and lead to cancer later in life that at least 32 states now regulate the use of tanning facilities by minors [17]. There is limited research on enforcement of laws directed to tanning facilities. One recent survey of the enforcement of state indoor tanning laws in the most populated cities of 28 U.S. states that have passed legislation for indoor tanning facilities was conducted by interviewing key informants (via telephone). These key informant surveys suggested that less than half of the cities inspected indoor tanning facilities for state law compliance and only 32% of cities conducted annual inspections [18]. Another study focused on tanning operators' opinions regarding youth accessibility and found that most operators believed that parental consent and minimum age regulations should be required [19]. An older study, using a survey in New York City, asked tanning salon operators about known risk of the danger of UV radiation [20]. It was shown that the salon operators were quite unaware of the harmful effects [20]. Another study surveyed tanning salon operators in three states (Colorado, Illinois, and Texas) and found that they were often giving clients misinformation about UV exposure risks [21]. A recent study of the presence of warning signs in tanning salons in New York City revealed that required warning signs on tanning machines were often not present or were not sufficiently visible [22]. Collectively, these studies suggest that law enforcement related to indoor tanning appears to be quite variable.

Social desirability of being tan appears to be a primary determinant of indoor tanning [23–25]. The desire to improve appearance [26–29] and increase self esteem [30] have been reported as strong motivational factors related to engaging in risky health behaviors, including deliberate tanning. There is a paucity of research about the characteristics of tanning facilities and the environments in which they are located. We, therefore, identified

the geographic areas and kinds of facilities in which artificial tanning devices are located within New York City, and the promotions used to encourage indoor tanning.

Methods

Phone numbers and addresses from Yellow Page books, and three online address sites (Google, Yahoo Local, and Switchboard) were used to identify indoor tanning businesses in the boroughs of New York City—Bronx, Brooklyn, Manhattan, Queens, and Staten Island. Using these multiple sources, two researchers independently verified the number of facilities ($n = 183$). Each facility was called to confirm that it was operational and offered tanning devices (in contrast to spray or gel tanning). Of these 183, 51% ($n = 93$) were no longer in operation or were incorrectly listed. Five were excluded for offering exclusively gel or spray tanning. Thus 85 tanning facilities were eligible for this study.

During April and May, 2010, direct observations of each facility were carried out by a single investigator to determine number of tanning machines, pricing, promotions, products, and hours. In addition, each business was assessed to determine if they had warnings posted in the lobby or on the observed walls about the potential dangers of tanning, or any warnings posted regarding age restrictions (under 14 years-old in New York State) or necessity of parental approval for underage clients (14–17 years-old in New York State).

Zip codes of each facility were obtained from the U.S. Census [31, 32] and linked to population density, gender, race, age, percent living in poverty, percent unemployed, and percent college educated. Data analysis involved descriptive statistics, including means and standard deviations for interval-level data and frequencies and percentages for categorical-level data. Chi square analysis and Student t tests were used to assess associations. Two-sided alpha levels of $<.05$ were considered significant. All analyses were performed using SPSS Statistics 17.0 (SPSS Inc., Chicago, Illinois). The Institutional Review Board at Columbia University Medical Center deemed this study exempt from human subject protection review.

Results

The 85 tanning facilities were located in 38 zip code areas in New York City. The breakdown of facilities by borough was as follows: Manhattan ($n = 46$), followed by Brooklyn, ($n = 18$), Queens ($n = 12$), Staten Island ($n = 8$), and the Bronx ($n = 1$). Table 1 displays the characteristics of the observed salons. Of the 85 tanning facilities, 62 (72.9%) were free standing tanning salons, 21 (24.7%) were within beauty salons, and the remaining 2 (2.4%) were part of fitness facilities. There were, on average, 11.2 (SD 7.8) tanning devices per facility, and the mean number of hours of operation was 13.2 (SD 2.6).

Pricing of indoor tanning was found to vary by the type of machine used (high vs. low pressure), the volume of sessions purchased, and whether use was bundled into a package. In-store promotions were often used to offset costs and attract higher volume business by offering discounts, specials, or “freebies.” One-third of salons offered unlimited tanning promotions. Almost all tanning services (83.5%) were less expensive under unlimited or multiple tanning packages versus single or weekly use. Specials were promoted in 10

(11.8%) of the facilities and included special pricing at different times such as “off peak” hours, or cash incentives for bringing a friend. Freebies were promoted in 22 facilities (25.9%) and included free tanning on Sundays, free tanning with purchase of a tanning accelerator, and receiving free gifts for bringing a friend in for the first time. The majority of facilities sold some type of tan enhancing product ($n = 67$), most frequently tanning accelerator ($n = 65$), followed by lotion that allegedly maintained a tan ($n = 34$), and moisturizer ($n = 33$). None of the businesses had warnings posted in the lobby or on the observed walls about the potential dangers of tanning, nor did any have signs posted regarding age restrictions (under 14 years-old in New York State) or necessity of parental approval for underage clients (14–17 years-old in New York State).

Selected socio-demographic characteristics of the zip code areas in which tanning facilities were located can be found in Table 2. Of the 187 zip code areas in New York City, tanning facilities were located in 38 (20%). Compared with the zip code areas with no tanning facilities, those where tanning facilities were located had greater population density (45,946 vs. 34,230 persons per sq. mile of land used, $P = .022$), a slightly greater median age (36.9 vs. 34.8 years, $P = .030$), a higher proportion of white residents (72.4 vs. 45.5%, $P < .001$) and a lower proportion of Black (6.2 vs. 27.8%) and Hispanic (15.7 vs. 25.0%) residents ($P < .001$ and $.009$, respectively). Residents in zip code areas where tanning facilities were located were less likely to be 15–19 years of age (4.6 vs. 6.5%, $P < .001$) and more likely to be 25–34 years (20.9 vs. 16.0%, $P < .001$); less likely to be living in poverty (14.0 vs. 18.9%, $P = .021$); less likely to be unemployed (4.0 vs. 5.8%, $P = .021$); and were almost twice as likely to have a college education (41.8 vs. 21.4%, $P = .036$).

Conclusions

This study utilized a cross-sectional study design and observations were conducted in one large city by a single observer (CHB). Nevertheless, this is one of the few direct observation studies examining this preventable cause of skin cancer. Only one other published study of the density of tanning salons in a large, metropolitan area was identified [9]. The findings of that study were consistent with the current study in that tanning facilities were found to be located in areas with higher concentrations of whites, but were inconsistent in that no difference in income level was found. In contrast, we found that compared with areas in which no tanning salons were located, areas surrounding tanning salons were characterized by high higher levels of education. This observation is noteworthy as, unlike other cancers, melanoma has higher incidence and prevalence in those with a greater socioeconomic status (SES) [33].

With regard to the promotion of indoor tanning, our findings are consistent with Kwon et al. [34] who found that facilities tend to promote unlimited tanning by making it more affordable. It is troubling that tanning is promoted in an unlimited way because tanning has been found to have addictive qualities [35]. Another study that compared advertising of indoor tanning to that used by the tobacco industry, found that promoters of both used similar strategies to intensify a sense of social acceptance [36].

We also found that tanning facilities were encouraging use of products that accelerated tanning and supposedly maintained a tan. Not surprisingly, none of the facilities sold any products with SPF. The lack of warning signs observed during the conduct of this study was similarly noted by Culley et al. [37] who used both direct observation and tanning salon attendant inquiries to document compliance with state and federal regulations in San Diego. The overt promotion of indoor tanning with incentives, discounts, and freebies in the absence of mandated warnings or products with SPF to protect the public presents a serious challenge for public health practitioners and policy makers, alike.

The description of areas in which indoor tanning salons are located, as well as the identification of promotions and other strategies to attract and maintain customers, are useful steps in the process of understanding how to address this growing health concern. Evidence suggests that the use indoor tanning contributes to the increasing rate of skin cancer incidence, particularly melanoma, the more serious form of skin cancer [1]. Yet preventing such exposure may be challenging due to the social desirability of tanned skin and the reportedly addictive nature of tanning [35].

Unlike the most prevalent forms of cancer, skin cancer disproportionately affects whites. Our data suggest that users of indoor tanning may have comparatively high levels of income and education and research indicates that their behavior appears to be modulated by the social desirability of a tan [23–29]. Influencing their behavior is likely to be difficult unless long-term interventions aimed at changing social norms are initiated.

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Table 1

Characteristics of tanning salons in all five New York City boroughs (Bronx, Brooklyn, Manhattan, Queens, and Staten Island) (n = 85)

	All boroughs	
	M	SD
Number of tanning devices	11.2	7.8
Hours in operation	13.2	2.6
	N	%
Number of facilities	85	–
Facility type		
Fitness facility	2	2.4
Beauty facility	21	24.7
Free standing	62	72.9
Promotions		
Discounts	71	83.5
Specials or deals	10	11.8
Freebies	22	25.9
Products sold *		
Tanning accelerator	65	77.4
Moisturizer	33	39.3
Tan Maintenance	34	40.5
Posted signs		
Potential dangers	0	.0
Age restrictions	0	.0
Parental consent	0	.0

Note: Due to overlap of characteristics, total is greater than 100%

*
n = 67

Table 2

New York City zip code area population characteristics (with tanning facility, n = 38; with no tanning facility, n = 149)

Characteristic	Zip code area with tanning facility		Zip code area with NO tanning facility		P
	M	SD	M	SD	
Population density *	45946.0	32006.0	34230.0	26868.0	.022
Median age	36.9	3.1	34.8	5.6	.030
	%		%		
Gender (%)					
Male	48.3		47.5		.193
Female	51.7		52.5		.194
Race (%)					
White	72.4		45.5		<.001
Black	6.2		27.8		<.001
Hispanic	15.7		25.0		.009
Age group (%)					
15–19 years	4.6		6.5		<.001
20–24 years	7.5		7.1		.297
25–34 years	20.9		16.0		<.001
35–44 years	16.5		15.8		.154
Living in poverty (%)	14.0		18.9		.021
Unemployed (%)	4.0		5.8		.021
College educated (%)	41.8		21.4		.036

* Number of persons per square mile of land area