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Abstract

Objective: To determine differences in sun-protection behaviours, and incidence of sunburn, between Australian adolescent female fake tan users and non-users. Design: Cross sectional survey. Method: 398 adolescent females aged 12 to 18 years participated in a survey at public venues, schools, and online. The main outcome measures were self-reported fake tan usage in the past 12 months, frequency of sunburns and habitual sun-protection behaviours. Setting: Surveys were completed in New South Wales, Australia. Results: The prevalence of self-reported use of fake tanning products in the past 12 months among Australian adolescent females was 34.5%. Female fake tan users were significantly less likely to report wearing a hat, wearing a shirt with sleeves or wearing pants covering to the knees. There was no difference between fake tan users and non-users in use of sunscreen, seeking shade, wearing sunglasses or avoidance of peak ultraviolet (UV) hours. Logistic regression modelling, when accounting for age, desire for a tan and skin type, revealed fake tan users were more likely to experience frequent sunburns and less likely to wear protective clothing. Conclusions: Our findings show that fake tan use among Australian female adolescents is associated with decreased sun protection, specifically reduced use of both upper and lower body protective clothing. Fake tan users were significantly more likely to experience repeated sunburns, after controlling for skin type. These findings provide impetus for the development of health education programmes targeting a new sub-group of adolescents with distinct tanning behaviours.

Keywords

adolescent, non, than, australian, behaviors, do, fake, protection, female, sun, practice, better, users, tan, sunless

Disciplines

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Do Australian adolescent female fake tan (sunless tan) users practice better sun-protection behaviours than non-users?

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Abstract

Objective: To determine differences in sun-protection behaviours, and incidence of sunburn, between Australian adolescent female fake tan users and non-users.

Design: Cross sectional survey.

Method: 398 adolescent females aged 12 to 18 years participated in a survey at public venues, schools, and online. The main outcome measures were self-reported fake tan usage in the past 12 months, frequency of sunburns and habitual sun-protection behaviours.

Setting: Surveys were completed in New South Wales, Australia.

Results: The prevalence of self-reported use of fake tanning products in the past 12 months among Australian adolescent females was 34.5%. Female fake tan users were significantly less likely to report wearing a hat, wearing a shirt with sleeves or wearing pants covering to the knees. There was no difference between fake tan users and non-users in use of sunscreen, seeking shade, wearing sunglasses or avoidance of peak ultraviolet (UV) hours. Logistic regression modelling, when accounting for age, desire for a tan and skin type, revealed fake tan users were more likely to experience frequent sunburns and less likely to wear protective clothing.

Conclusions: Our findings show that fake tan use among Australian female adolescents is associated with decreased sun protection, specifically reduced use of both upper and lower body protective clothing. Fake tan users were significantly more likely to experience repeated sunburns, after controlling for skin type. These findings provide impetus for the development of health education programmes targeting a new subgroup of adolescents with distinct tanning behaviours.

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Keywords

adolescents, skin cancer prevention, sunburns

Introduction

Despite over 20 years of population-wide interventions to improve sun protection in Australia, the major barrier to sun protection among adolescents continues to be the desirability of a tan, with available data showing that, as desire for a tan increases, sun-protection behaviour decreases.¹ Fake tan products are lotions and sprays which temporarily pigment the skin without requiring exposure to ultraviolet (UV) radiation. Fake tanning has presented a significant challenge for cancer control agencies since its emergence due to the perception that promoting such products sends the 'wrong message' to the community regarding the desirability of a tan.² While there is a substantial body of literature on adolescent sun-protection behaviours there has been limited research on the effect fake tan products have on adolescent UV exposure and associated sun-protection behaviours. Given the lack of evidence to date, cancer control agencies have not promoted the use of fake tanning products as a safe alternative for obtaining a tan.

The fake tanning industry is booming, with an estimated growth rate of 429% from 2001 to 2006, and projections to become a half a billion dollar industry by 2011.³ Findings on the prevalence of fake tanning product use among adults differ between studies, ranging from 9% in an Australian population aged 15 years and older⁴ to 22% among United States (US) adults aged between 18 and 30 years.⁵ Among US adolescents, approximately 11% report using fake tan products in the previous 12 months.⁶ However, few studies have focused on the prevalence of fake tanning use specifically among Australian adolescents, or on the differences in sun-protection behaviours between users and non-users.

Existing literature on fake tan use and associated sun-protection behaviours is sparse, with conflicting results. Among adolescents in the US, fake tan use was associated with indoor tanning and higher frequency of sunburns but not use of sunscreen.⁶ Studies among primarily adult populations have shown that individuals who have used fake tan products in the past year are more likely to report regularly using sunscreen with sun protection factor (SPF) 15+ when in the sun than non-users.^{4-5, 7-8} On the other hand, all but one study⁹ show that fake tan users are more likely to report being sunburned,^{5, 8, 10} including both Australian and US adults. Studies comparing the use of protective clothing between users and non-users have also been inconsistent. Beckmann et al.⁸ noted that users were less likely to report regularly wearing protective clothing than non-users, while Girgis et al.⁴ and Stryker et al.⁷ found no significant differences in use of protective clothing between the two groups. Similarly, findings on shade use have been inconsistent; Stryker et al.⁷ found users were significantly less likely to seek shade, whereas Beckmann et al.⁸ found no significant difference between groups.

The aim of this study, therefore, was to assess the use of fake tanning products among adolescents in New South Wales, Australia, and to examine similarities and differences in users' versus non-users' reported sun-protection behaviours and incidence of sunburns.

Methods

In spring 2009, adolescents from New South Wales (NSW) were invited to participate in a survey at public venues, schools, and online. Respondents who completed the paper-based survey were identified within high schools and at public events around a regional NSW coastal community. Online respondents were identified via a promotion on the social networking site Facebook (www.facebook.com) with promotion restricted to NSW residents aged 12–18 years.

Table 1. Summary of Summer Lifestyle Survey questions and response categories, surveyed in spring, NSW, Australia, 2009

Questions	Response options
<p>During summer in general, when you are outside on a warm sunny day, how often do you usually do the following:</p> <ul style="list-style-type: none"> • Wear sunscreen • Wear a hat • Stay in the shade • Wear a shirt with sleeves that covers your shoulders • Wear long pants/skirt that covers your legs at least to your knees • Wear sunglasses • Spend most of the time inside during peak UV hours in the middle of the day 	<p>Never (1) Rarely Sometimes Often Always (5)</p>
In the past 12 months, how many times did you have a red or painful sunburn that lasted a day or more?	0, 1, 2, 3, 4, 5, 6, 7, 8 or more
Have you made any attempt to get a tan in the last 12 months by using a sunless tanning cream (fake tan) or spray tan?	Yes No
<p>Suppose your skin was exposed to strong sunshine at the beginning of summer with no protection (e.g. sunscreen, hat) at all. If you stayed in the sun for 30 minutes would your skin:</p> <p>Do you like to get a suntan?</p>	<p>Just burn and not tan afterwards Burn first then tan afterwards Not burn at all just tan Nothing would happen No Yes, a light tan Yes, a moderate tan Yes, a dark tan Yes, a very dark tan</p>

Description of participants

This analysis has been limited to female respondents because the overwhelming majority of fake tan users were female (95.8%) with only six male respondents reporting fake tan use in the previous 12 months.

Measures

The self-report survey was part of a larger Summer Lifestyle Survey on adolescent sun protection attitudes and behaviours. Prevalence of fake tan use was assessed with an item similar to that used by Beckmann et al.⁸: 'Over the past 12 months have you used a fake tanning lotion or cream to make you look more tanned?'. Pre-testing of the instrument with adolescents resulted in the inclusion of the term 'spray tan'. The final wording of the item was 'Have you made any attempt to get a tan in the last 12 months by using a sunless tanning cream (fake tan) or spray tan?'. Number of sunburns in the previous 12 months was assessed with the question 'In the past 12 months, how many times did you have a red or painful sunburn that lasted a day or more?'. This item wording is consistent with recently-recommended standardized US measures of adolescent sun exposure and protection, however with the addition of response options from '5 or more' up to '8 or more'.¹¹ The survey questions and response options are included in Table 1.

Table 2. Fake tan use among adolescent females surveyed in spring 2009 from NSW, Australia, by demographic variables

Fake tan use	Yes % (n)	No % (n)
Females	34.5% (137)	65.5% (260)
Age		
12–14 years	27.2 (55)	72.8 (147)
15–16 years	41.6 (32)	58.4 (45)
17–18 years	42.4 (50)	57.6 (68)

To examine the sun-protection behaviours of users' and non-users' of fake tanning products, respondents indicated how often they applied sunscreen, wore a hat, wore a shirt with sleeves, wore sunglasses and sought shade when in the sun between 11am and 3pm. These five items were selected as they represent the current guidelines for sun-protection behaviours as recommended by Cancer Council NSW¹² and are consistent with recently-recommended standardized US measures of adolescent sun protection.¹¹ Additional measures of lower body protective clothing and avoidance of peak UV hours were included to increase the specificity of the assessment.

Statistics

Descriptive statistics were generated for fake tan use and demographic variables. Differences between fake tan users and non-users on sun-protection behaviours were assessed using cross-tabulation and multivariate analysis of variance. Logistic regression modelling was used to assess the relationship between fake tan use, sunburns and sun-protection behaviours controlling for age, desire for a tan and skin type. For the model, the number of sunburns was grouped into low sunburns (0–1 sunburns in the previous 12 months), moderate sunburns (2–4 sunburns in the previous 12 months) and frequent sunburns (5 or more sunburns in the previous 12 months). Fake tan use was the dependent variable. For each sun-protection behaviour, response options were coded from 1 (never) to 5 (always).

Results

Overall, 398 females aged 12 to 18 years ($M = 15.08$, $SD = 1.68$) participated in the survey. Demographic data on the fake tan users and non users are shown in Table 2. The prevalence of fake tan product use during the past 12 months among adolescent females aged between 12 to 18 years was 34.5%. The frequency of fake tan use increased significantly with age, with the highest proportion of fake tan users (42.4%) being among the 17–18 year old category ($\chi^2(2) = 9.66$, $p = .008$).

Descriptive statistics for sun-protection behaviours among females using and not using fake tan products are shown in Table 3. Multivariate analysis of variance was used to assess differences in sun-protection behaviours between users and non-users, and indicated significant differences (Wilks' Lambda = .864, $F(7,358) = 8.03$, $p = .000$). At the univariate level the results indicate that females who reported using fake tan in the previous 12 months were significantly less likely to report regularly wearing a hat, wearing a shirt with sleeves and wearing pants that cover at least to the knees. There was no significant difference in mean values for self-reported

Table 3. Descriptive statistics for sun protection behaviours among adolescent females in NSW Australia using and not using fake tan products, surveyed in spring 2009

During summer in general	Fake tan users (<i>n</i> = 137)		Non-users of fake tan (<i>n</i> = 261)		<i>P</i>
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	
Use sunscreen	3.31	.090	3.31	.064	.997
Wear a hat	2.03	.096	2.40	.068	.002
Seek shade	2.90	.079	3.09	.057	.061
Wear a shirt with sleeves	2.49	.088	3.18	.063	.000
Wear pants to at least the knees	1.85	.091	2.43	.065	.000
Wear sunglasses	3.61	.111	3.39	.080	.102
Avoid peak UV hours	2.73	.091	2.82	.065	.450

M = Mean, *SE* = Standard Error.

sunscreen use, shade use, wearing sunglasses and avoidance of peak UV hours between fake tan users and non-users.

To examine the association between fake tan use and sunburns, logistic regression modelling was used. The model included factors likely to confound the association between fake tan use and sunburns including gender, age, skin type, sun-protection behaviours and preference for a tan. The results for the regression model are shown in Table 4. The findings show there was a significant association between fake tan use and sunburns with fake tan users more likely to experience 2–4 sunburns (OR = 2.13, 95% CI, 1.17–3.86) and five or more sunburns (OR = 4.39, 95% CI, 1.78–10.83). Fake tan use and skin type were also significantly associated, with fake tan users less likely to report having a skin tone that ‘burns then tans’ (OR = 0.23, 95% CI, .11–.49) or skin that ‘just tans’ (OR = 0.23, 95% CI, .10–.54).

Fake tan use in the previous 12 months was significantly associated with reduced likelihood of wearing upper body protective clothing ($B = -.72$, $SE = .78$, $p = .000$) or lower body protective clothing ($B = -.40$, $SE = .17$, $p = .023$). Fake tan use and desire for a suntan were also significantly associated. Fake tan users were significantly more likely to desire a light (OR = 4.60, 95% CI, 1.56–13.60), moderate (OR = 7.82, 95% CI, 2.63–23.313), or dark tan (OR = 4.42, 95% CI, 1.33–14.76).

Discussion

The prevalence of fake tan use among this sample of female adolescents (34.5 %) is higher than previously reported prevalence among primarily adult populations which ranged from 9%⁴ to 22%,⁵ and higher than the prevalence of 19.1% among US female adolescents aged 11–18 years reported by Cokkinides et al.⁶ Our findings show that fake tan use among Australian female adolescents is associated with decreased sun protection, specifically reduced use of both upper and lower body protective clothing. Unlike earlier studies^{4–5, 7–8} we did not find that females who used fake tan products in the past year were more likely than non-users to report regularly using sunscreen when in the sun. In contrast, we found no difference between the self-reported sunscreen use of the two groups.

Table 4. Correlates of fake tan use among adolescent females in NSW Australia, surveyed in spring 2009

	Odds ratio	95% CI	p value
Age			.026
12–14 years	1.0		
15–16 years	1.65	(.812–3.333)	.167
17–18 years	2.37	(1.253–4.484)	.008
Skin type			.001
Just burn	1.0		
Burn then tan	.234	(.111–.490)	.000
Tan only	.231	(.098–.542)	.001
Nothing would happen	.289	(.065–.279)	.102
Sun-protection behaviours			
Sunscreen use	1.214	(.905–1.628)	.195
Hat use	.818	(.611–1.095)	.177
Shade use	1.151	(.788–1.683)	.467
Upper body protective clothing use	.488	(.346–.689)	.000
Lower body protective clothing use	.673	(.478–.947)	.023
Wear sunglasses	1.007	(.799–1.270)	.952
Avoid peak UV hours	1.294	(.961–1.741)	.089
Sunburns			.002
Low (0–1 burns)	1.0		
Moderate (2–4 burns)	2.126	(1.171–3.859)	.013
Frequent (5 + burns)	4.387	(1.778–10.825)	.001
Desire for a tan			.006
No	1.0		
Yes, a light tan	4.600	(1.555–13.604)	.006
Yes, a moderate tan	7.823	(2.625–23.311)	.000
Yes, a dark tan	4.424	(1.326–14.763)	.016
Yes a very dark tan	4.789	(.956–23.975)	.057

Notably, we found that fake tan users were significantly more likely to experience repeated sunburns, after controlling for skin type. The association between fake tan use and increased sunburns is consistent with previous studies among adolescents in the US⁶ and adults in both US and Australian populations.^{5, 8, 10} However, given minimal studies specific to the adolescent population, this study provides disconcerting data on the association between fake tan use and frequent sunburns among Australian adolescents. As adolescence and early adulthood are among the most sensitive age periods for the effects of sunburn and future incidence of skin cancers,¹³ these findings should provide an impetus for further investigation into the nature of the relationship between fake tan use and sunburns specifically among the adolescent population. As a harm minimization strategy our results provide no evidence for cancer control agencies to promote fake tan products as a safe alternative to tanning in the sun. However, the association between increased desire for a tan and fake tan use suggests fake tan users represent a distinct tan-seeking segment of adolescents and an appropriate target group for interventions.

A possible limitation of this study is the use of both written and online survey approaches for data collection. There is a lack of data available on if completing surveys in an online format versus

on paper influences how individuals respond to questions about their sun-protection behaviours. The potential that respondents were influenced by the survey approach method cannot be excluded. As this study used a non-random sample and was cross-sectional in nature it was not possible to confirm that the use of fake tan directly increases the risk of sunburn; however, there is a significant association between the two factors. Brooks et al.⁵ postulate the association between fake tan use and sunburns is a result of individuals using fake tan products being unaware that they provide negligible sun protection; they also suggest that fake tan users may be more likely than others to seek tans or accentuate the tans they receive from the sun or tanning beds. Given the significant association between fake tan use and increased desire for a tan, it is more plausible that fake tan users represent a distinct tan-seeking segment of adolescents rather than just being unaware that a fake tan provides no protection from the sun. These associations are yet to be investigated in the literature. The potential that fake tan use is associated with an increased likelihood of frequent sunburns among Australian adolescents is worrisome. Given the increasing popularity of fake tan products in our society, coupled with the significant risk associated with sunburn obtained during adolescence and future risk of skin cancer, further research is needed in this area.

Conclusion

Our findings show that fake tan use among Australian female adolescents is associated with decreased sun protection, specifically reduced use of both upper and lower body protective clothing. Fake tan users were significantly more likely to experience repeated sunburns, after controlling for skin type. Further research is needed to determine the direction and strength of the association between use of fake tan products, decreased sun-protection behaviours and sunburns.

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References

1. Livingston PM, White V, Hayman J, Dobbins S. Australian adolescents' sun protection behavior: Who are we kidding? *Prev Med*, 2007; **44**(6): 508–512.
2. Chapman S. Faking it: Should cancer control agencies promote 'fake' tanning lotions? *Med J Aust*, 1999; **170**(12): 603–604.
3. Research&Markets. *The Sunless Tanning Market is Expected to Top \$500 Million by 2011*. Business Wire: Business Wire, 2007.
4. Girgis A, Tzelepis F, Paul CL, Walsh RA, McElduff P, McKenzie J. Australians' use of fake tanning lotions: Another piece of the puzzle. *Aust N Z J Public Health*, 2003; **27**: 529–532.
5. Brooks K, Brooks D, Dajani Z, Swetter SM, Powers E, Pagoto S, et al. Use of artificial tanning products among young adults. *J Am Acad Dermatol*, 2006; **4**: 1060–1066.
6. Cokkinides VE, Bandi P, Weinstock MA, Ward E. Use of sunless tanning products among US adolescents aged 11 to 18 years. *Arch Dermatol*, 2010; **146**: 987–992.

7. Stryker JE, Yaroch AL, Moser RP, Atienza A, Glanz K. Prevalence of sunless tanning product use and related behaviors among adults in the United States: Results from a national survey. *J Am Acad Dermatol*, 2007; **56**: 387–390.
8. Beckmann KR, Kirke BA, McCaul KA, Roder DM. Use of fake tanning lotions in the South Australian population. *Med J Aust*, 2001; **174**: 75–78.
9. Dixon H, Capiello M, Borland R. *Reaction to the 1994/1995 SunSmart Campaign: Results From a Representative Household Survey of Victorians*. Melbourne: Anti-Cancer Council of Victoria, 1997 (pp. 46–49).
10. Purchase M, Borland R. *Public reactions to the 1992/93 SunSmart Campaign: Results From a Representative Survey of Victorians*. Melbourne: Anti-Cancer Council of Victoria, 1994 (pp. 83–93).
11. Glanz K, Yaroch AL, Dancel M, Saraiya M, Crane LA, Buller DB, et al. Measures of sun exposure and sun protection practices for behavioral and epidemiologic research. *Arch Dermatol*, 2008; **144**: 217–222.
12. Cancer Council NSW. *Be SunSmart*. Online. Available: <http://www.cancercouncil.com.au> (accessed 27 August 2010).
13. Veierod MB, Weiderpass E, Thorn M, Hansson J, Lund E, Armstrong B, et al. A prospective study of pigmentation, sun exposure, and risk of cutaneous malignant melanoma in women. *J Natl Cancer Inst*, 2003; **95**: 1530–1538.