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Public at risk: a survey of sunbed parlour operating practices in Northern Ireland

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Summary

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Background The International Agency for Research on Cancer has identified artificial ultraviolet (UV) radiation as a class 1 carcinogen. The contribution of sunbeds to malignant melanoma has been estimated at 100 deaths per year in the U.K. The sunbed industry is growing and claims self-regulation.

Objectives To explore the standards of operation and client protection for sunbed users.

Methods An observational study of tanning parlour practices was conducted by Environmental Health Practitioners who made unannounced visits to the majority of known commercial tanning parlours in Northern Ireland (population 1.77 million) during July/August 2007. Descriptive statistics were produced and comparisons between groups were made using χ^2 analysis.

Results All 332 premises visited cooperated with the survey. The UV type in machines was unknown in 71.2% of premises while 15.6% reported using type 4, high-dose UV devices; 36.2% of premises did not regularly service sunbeds or were unsure. Unsupervised use of sunbeds was reported in 8.6% of parlours and 3.4% provided a home sunbed service. Eye protection was available in 97.6% of premises but 34.6% charged for the service and only 79.6% sanitized these between use. Of the responders 15.9% were members of the Sunbed Association. These were more likely to have maintenance records and operating manuals but were also more likely to provide a home sunbed service.

Conclusions This study highlights the need for improved standards of regulation of the sunbed industry to protect clients from excessive and dangerous levels of UV radiation in a population where the numbers of melanomas continue to rise.

The use of artificial tanning equipment is a phenomenon of the last 30 years in Northern Europe: by the late 1990s over 60% of women and 50% of men aged 18–50 years had reported sunbed use.¹ Sunbed use is directly related to development of skin cancers.^{2,3} The International Agency for Research on Cancer (IARC) has recently classified ultraviolet (UV) radiation from sunbeds as a class 1 carcinogen⁴ in the same category as tobacco. Northern Ireland (NI) in common with many countries has witnessed an increase in the number of melanoma and nonmelanoma skin cancers in recent times, with a 195% increase in melanomas during 1984–2007.⁵ Despite this and recent public health campaigns sunbed use appears to be becoming more prevalent especially in younger girls.⁶ There is also concern that frequent users of sunbeds are

also regular sunbathers, further increasing their risk of developing skin cancer.⁷ The sunbed industry in NI continues to grow, despite the indigenous fair-skinned celtic population. There is currently no legislation in the U.K. specifically protecting sunbed users. Local Government in NI acknowledges the health-damaging effects of sunbeds and has prohibited the use of sunbeds in council premises. This survey examined practices of commercial sunbed parlours to assess operational safety and user protection measures.

Materials and methods

Questionnaires comprising 36 questions were completed by Environmental Health Practitioners (EHPs) on unannounced

visits to tanning premises throughout NI (population 1.77 million) during July/August 2007. These visits were performed under health and safety legislation. In NI EHPs are allied to 26 District Councils, representing all areas in NI. The EHPs interviewed the owner or manager of the premises and completed questionnaires during the visit. They also inspected maintenance records, hygiene practices, customer information and staff training.

The questionnaire was formulated and piloted in consultation by the Sunbed Working Group of the Northern Ireland Melanoma Strategy Implementation Group, a multiprofessional agency tasked with public education campaigns. Data were analysed in SPSS (Chicago, IL, U.S.A.), descriptive statistics were produced and comparisons between groups were made using χ^2 analysis.

Results

Three hundred and thirty-two premises which provided tanning facilities were visited by EHPs over an 8-week period. Data were returned for all premises surveyed, representing 25 of NI's 26 District Council areas. Parlour density broadly reflected population density with the largest concentration in the area covered by Belfast City Council ($n = 60$).

Sunbed type

Eighty-three different manufactured brands of sunbeds were in use in the 332 premises. The most popular device was the Ergoline Turbo Power Classic 600[®] (Ergoline, Woodford Green, U.K.) used in 5.1% of premises. In 11.6% ($n = 32$) of premises the manufacturer of the sunbed was unknown. The UV typing of sunbeds was unknown in 71.2%, while 15.6% of premises reported using type 4 machines (high-output UV devices) with type 3 machines available in 5.0% of premises (see Fig. 1). Tube wattage varied (see Fig. 2): the most popular was a 160-W tube; however, significantly higher wattage was used in some premises. In some cases different wattages of bulb were used in the same device. In addition, different brands were used in the same device in some premises. Sun tanning accelerator creams were available for purchase in 85.8% of premises.

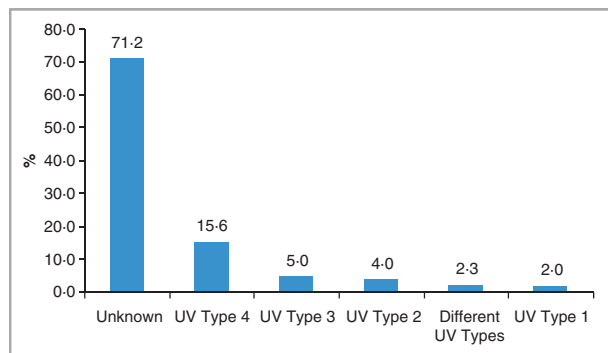


Fig 1. Ultraviolet (UV) typing of sunbed.

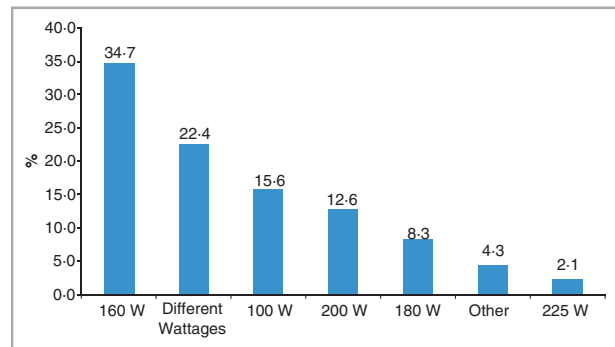


Fig 2. Tube wattage used in sunbeds.

Maintenance

Regarding maintenance provision, 73 different responses were noted. Maintenance was provided by suppliers/manufacturers in 57.8% of premises and by owners/staff in 16.6%. No maintenance was provided in 1.6% of premises (see Fig. 3). The date of the last inspection of fixed electrical installations was unknown in 34.4% and the operating manual for the sunbed was unavailable in 70.7%.

User screening

Prior to utilization, 88.1% of premises stated they had a screening questionnaire although this was unavailable in 16.2% of these premises. Items covered in screening questionnaires varied (see Fig. 4). Staff in 43.4% of salons with a screening questionnaire decided the client's skin type, in 11.4% of premises the client determined their own skin type and a joint decision was made in 45.2%. Skin type 1 clients were advised not to use a sunbed in 55.1% of premises. Age limits were set in 97.6% of premises. In these, the lower age limit was 16 years in 70.8% of premises while in 27.3% of premises the limit was 18 years.

Records

Of the premises 95.7% kept initial visit customer records, with 85.6% of premises keeping records of subsequent visits. The length of time records were kept varied (see Fig. 5).

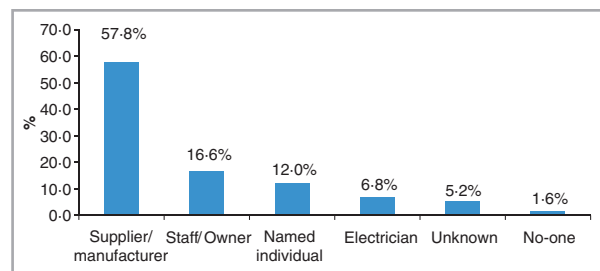


Fig 3. Details of who provides maintenance for sunbeds.

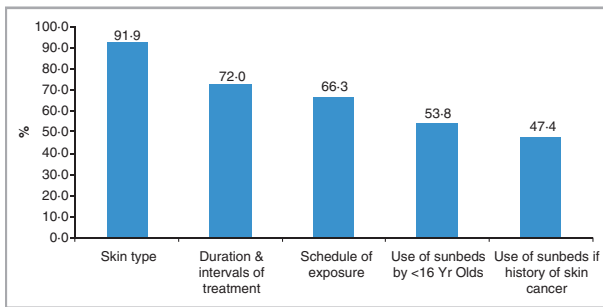


Fig 4. Topics covered in screening questionnaire.

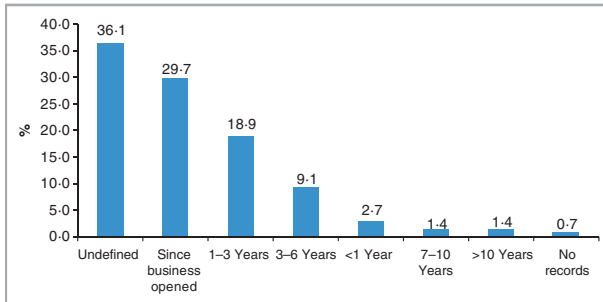


Fig 5. How long do premises keep records?

Duration and frequency of exposure

Almost half of premises reported that clients had cards or tokens that regulated their duration of exposure, with 4.5% having unregulated duration of exposure (see Fig. 6a). Similar methods were used to limit the frequency of exposure; however, 7.3% of premises allowed unregulated frequency of ex-

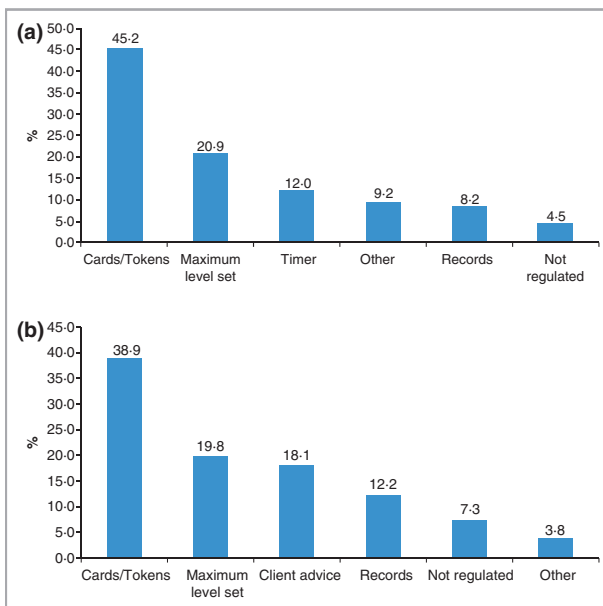


Fig 6. (a) Method of regulation of exposure at sunbed session. (b) Method to regulate frequency of exposure.

posure (see Fig. 6b). The manufacturer's schedule of exposure was not on display in 67.9% of premises. Unsupervised use of sunbeds was reported in 8.6% of parlours, while a further 3.4% of premises provided a home sunbed rental service.

Hygiene and eye protection

Of the premises 98.8% reported that sunbeds were cleaned after use; however, this cleaning was performed by the staff in only 79.3% of premises with customers expected to provide cleaning in others. Of the premises 97.6% provided eye protection for clients. In 71.2% of these goggles used were CE marked (a mandatory conformity marking in the European Union). There was a charge for eye protection in 34.6% of cases. Only 79.6% of premises sanitized reusable eye protection after use.

Staff training

Staff training was delivered by various providers, most commonly by the owner/manager (41.1%). The Sunbed Association provided training in only 1.9% of premises (see Fig. 7). A training syllabus was available in 11.2% of premises. Most frequently covered topics in training included duration of use (96.6%) followed by equipment operation (95.4%). The subject addressed least in basic training was the risk assessment policy, included in only 16.4% of premises (Fig. 8). Claimed health benefits of sunbeds were advertised in 16.3% of premises. Of the premises 95.7% had no instructions in other languages, and 20.3% of premises employed staff < 18 years of age.

Sunbed Association membership

Of the responders 15.9% were members of the Sunbed Association. Over 10% of members surveyed operated without a prescreening health and safety questionnaire; furthermore, over 30% reported an unknown date of last service, 17.1% of premises were unaware of the frequency of Portable Appliance Tests and 50.0% had no operating manual available on the premises (see Table 1). However, they were more likely to have operating manuals available, regular maintenance and maintenance records than nonmembers. They were also more likely to clean eye protection between use. Members of the Sunbed Association were also more likely to provide sunbeds for home hire.

Discussion

The relationship between sunbed use and increased risk of malignant melanoma is now confirmed by the IARC.⁴ The UV intensity of currently used tanning appliances may be 10–15 times that of the midday sun,⁸ leading to UV doses per unit area of skin well in excess of daily activities in the sun or sunbathing. Meta-analysis by the IARC has concluded that sunbed use before 30 years of age increases risk of malignant

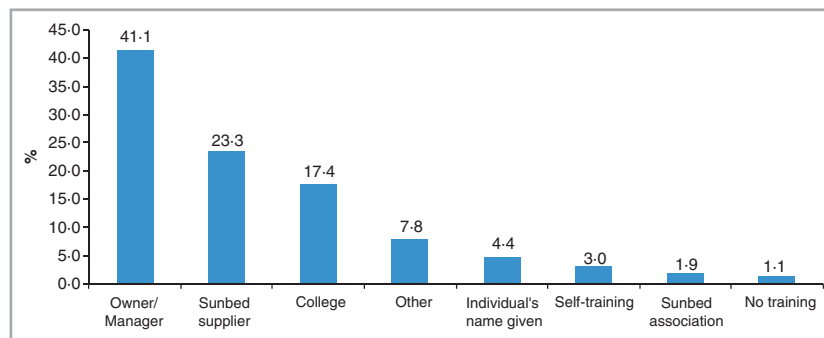


Fig 7. Organizations or individuals who provide training to staff regarding ultraviolet issues.

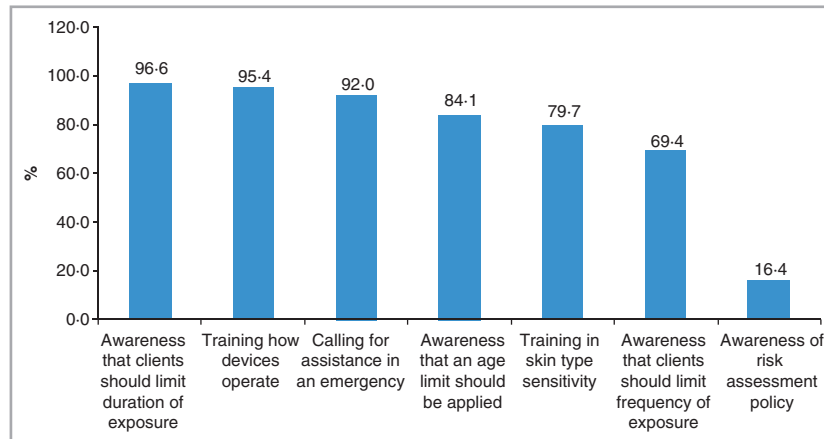


Fig 8. Topics covered in staff awareness training.

melanoma by 75%.² Specifically in the U.K., the contribution of sunbeds to malignant melanoma mortality has been estimated at 100 deaths per year⁹ and significant sunbed use increases the chance of a young individual with fair skin developing malignant melanoma by 2.66.¹⁰

Despite this, artificial tanning devices such as sunbeds and sunlamps are increasingly used especially in the teenage population; the reasons stated for this include peer pressure, the feeling of well being and improved self confidence. The sociological perception of the aesthetics of sun tans has led to a

	Sunbed Association membership % (n observed/n total)		P-value
	Member	Nonmember	
Type of tanning device unknown	11.4 (5/44)	12.3 (26/212)	0.87
Home sunbed service	11.4 (5/44)	2.2 (5/230)	< 0.01
UV type unknown	61.7 (29/47)	72.6 (170/234)	0.32
Maintenance provided regularly	79.2 (38/48)	60.4 (139/230)	0.02
Date of last service known	69.4 (34/49)	64.1 (148/231)	0.48
Frequency of testing known	82.9 (29/35)	56.8 (88/155)	< 0.01
Operating manual available	50.0 (25/50)	25.3 (62/245)	< 0.01
Client screening questionnaire	89.8 (44/49)	87.4 (215/246)	0.64
Accelerator cream for sale	92.0 (46/50)	84.5 (213/252)	0.17
Charge for eye protection	25.5 (13/51)	34.2 (83/243)	0.23
Clean eye protection between use	95.0 (38/40)	78.1 (150/192)	0.01
Staff training provided by owner	50.0 (22/44)	38.1 (77/202)	0.15
Customer records kept (initial visit)	95.9 (47/49)	95.1 (234/246)	0.81
Type 4 sunbed (high dose)	21.3 (10/47)	15.0 (35/234)	0.32
Unsupervised use	6.0 (3/50)	8.8 (21/240)	0.64
Age limit set	98.0 (50/51)	97.2 (246/253)	0.65

Twenty-eight premises with unknown membership excluded from analysis to complete χ^2 . Difference in totals due to variation in nonresponse in each variable. UV, ultraviolet.

Table 1 Selected responses to questions presented by premises' membership of the Sunbed Association with observed proportions and χ^2 P-values

pervasive prevalence of tanning in younger people especially for school events, religious ceremonies and dancing competitions.^{11,12} A Scottish epidemiological study showed that 7% of 8–11 year olds had used a sunbed.¹³

This large study documents client exposure to high-powered UV devices with limited attempts to regulate frequency and duration of use. Although artificial UV radiation has its use in industry and medicine where high-powered type 4 devices are utilized, these are not appropriate for tanning parlours and yet were in use in at least 15.6% of premises, thereby increasing clients' risk of skin cancer.

Sunbeds are currently subject to an international standard established by the International Electrotechnical Commission (IEC1995). Four types of appliances are recognized in this standard. The emission characteristics and the health risks of each appliance are different.¹⁴ Type 4 appliances are associated with high levels of UVB, and are intended for medical purposes and should not be used in sunbeds as they have high carcinogenic potential. Only type 1 and type 2 devices should be used in sunbeds.¹⁵ The utilization of type 4 sunbeds in over 15% of premises visited, with unknown UV typing in 71.2%, is particularly disturbing and will undoubtedly increase the disease burden of both malignant melanoma and non-melanoma skin cancer in future years. This phenomenon is also recognized in other parts of the U.K. with a study in Scotland having documented that 83% of sunbeds produced UVB radiation levels that exceeded the European standard.¹⁶

There is poor supervision of duration and frequency of UV exposure. Operators frequently fail to screen clients before utilization of devices and while salons reported cards and tokens as the most common method of regulating use, it was unclear how this and other methods limited duration and frequency of use. In addition, many premises did not adequately consider client skin type. A study in NI showed that only 40% of the indigenous population of NI felt they were skin type I and II, with over 30% typing themselves as type V or VI (Northern Ireland Statistics & Research Agency, Northern Ireland Omnibus Survey, Gavin A, Personal Communication, September 2008), demonstrating poor comprehension of personal skin types among the population. Reliance, therefore, on users having knowledge of their own skin type is an unsafe mode of skin type vetting. While some premises train staff to be aware of vetting of minors using sunbeds there is little evidence from this study of minors being prohibited from using sunbeds, often with an inappropriate approach to young users with fair skin.

Previous studies have documented a poorly regulated tanning parlour industry with poor attention to the servicing, protection, hygiene and basic functioning of these booths.^{17,18} This study also highlights poor operational standards in many premises with young and inexperienced staff responsible for client education and safety. Basic maintenance is astonishingly inconsistent with *ad hoc* practice in terms of servicing, calibration, bulb replacement and electrical checks. Basic hygiene is concerning in many premises. Eye protection is also suboptimal with 34.6% of premises charging for eye protection and almost 29% of goggles not CE marked. Given consistent

evidence of a positive association between the use of sunbeds and ocular melanoma^{19,20} such practice seems very irresponsible.

Public health messages alerting the public to dangers of UV radiation have had to be tempered by the emerging benefits of vitamin D synthesis and suggestions that vitamin D deficiency is a public health issue.²¹ However, awareness that moderate sun exposure will produce adequate levels of vitamin D without resorting to artificial tanning devices is a public health message complementary to current campaigns.^{22,23} There are no health benefits for artificial tanning units to 'top-up' vitamin D levels,²⁴ a suggestion that is implicit in the tanning bed industry message; indeed, 16.3% of parlours in our survey advertised the health benefits of artificial UV sources.

This study highlights the need for government to implement safer standards of regulation of tanning facilities with increased user education of the risk of these devices, especially for fair-skinned individuals. The Sunbed Association claims a regulatory function yet less than one-fifth of premises are members and their practice appears no safer, questioning their ability to self-regulate. The provision of sunbeds for home hire presents an unquantified risk; however, the exposure potential of this service is alarming with users given promotional offers to keep devices for longer periods with reduced rental deals. This practice should be specifically addressed under industry regulation.

Acknowledgments

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