The Effectiveness of a Pharmacist-Led Sun Protection Counselling Service: Results from a Tertiary Dermatology Centre in Singapore

Dear Editor,

Exposure to ultraviolet (UV) radiation is associated with an increased risk of skin cancer, and the incidence of skin cancer is increasing worldwide. Sun exposure also aggravates other dermatological conditions such as rosacea.

Awareness of the importance of sun protection and sun protection behaviour patterns varies greatly amongst individuals. Young children are mostly guided by their parents,[1] while adolescents tend to have the lowest sun protection rates and are largely influenced by the entertainment industry and social media.[2-4] Adult women are more likely than men to take sun protective measures.[3,5-6]

A number of studies has demonstrated that sun protection counselling by healthcare providers can have positive effects on knowledge and prevention practices.[7-8] However, most of these studies have been carried out in Caucasians and the paediatric population.[1,7-9] In addition, previous data has showed that in general, few physicians provide sun protection education—the biggest obstacles cited include lack of proper training and insufficient time.[10-11] Several papers have reported that there is a role for pharmacists in educating patients about sun protection.[12-14]

Therefore, the aim of this study was to assess and compare sun protection-related knowledge and behaviours within a group of patients and non-medical staff members at a tertiary dermatology centre in Singapore, and to evaluate the effectiveness of a dedicated pharmacist-led counselling service in improving understanding.

Materials and Methods

Our study was conducted from May to October 2013. Fifty patients who were on follow-up at the National Skin Centre (NSC) and 50 non-medical staff members (nurses, pharmacy technicians, clinic assistants and administrative staff) were recruited. The patients included those who were deemed by their attending physician to require sun protection counselling, as well as patients who agreed to be included in the study.

Demographic characteristics and details regarding each subject's usual sun protection behaviours were gathered. The participants answered a 10-question questionnaire designed by the authors to assess sun protection understanding, attitudes and behaviours (Appendix). Each subject then underwent a standardised 20-minute counselling session with the aid of a computer slide presentation by a trained pharmacist. The participants were surveyed again immediately after the session to assess the efficacy of the intervention.

Results

Baseline Characteristics of Study Subjects

These are detailed in Table 1. The mean age was higher in the patient group (47.9 years compared to 34.1 years). The 50 patients consisted of an equal number of males and females, while most of the 50 staff members were female (37/50 or 74%). Most of our study subjects had black hair

Table 1. Characteristics of Study Subjects

Characteristic	Patients (n = 50)	Staff Members (n = 50)
Age (years)	13 – 89	23 – 64
Mean	47.9	34.1
Gender		
Male	25	13
Female	25	37
Hair colour		
Black	37	43
Brown	12	7
Blonde	1	
Skin colour		
Very fair	2	
Fair	19	22
Light brown	21	22
Dark brown	7	6
Data unavailable	1	
Fitzpatrick skin type		
I	3	1
II	15	5
III	14	20
IV	7	11
V	4	4
VI	6	1
Data unavailable	1	

Table 1. Characteristics of Study Subjects (Cont'd)

Characteristic	Patients (n = 50)	Staff Members (n = 50)
Education level		
Primary	2	
Secondary	16	12
Pre-university	13	13
University	4	13
Postgraduate	14	10
Data unavailable	1	2
Occupation		
Indoor	31	50
Outdoor	6	
Indoor and outdoor	5	
Retired	6	
Data unavailable	2	
Hours spent in the sun per week	0.5 – 42.5	1 – 36
Mean	8.72	6.76
No. of sunburns in the past 1 year	0 – 8	0 – 6
Mean	0.67	0.94
Family history of skin cancer		
Yes	3	2
No	47	48

Table 2. Baseline Sun Protection Behaviours

Behaviour	Patients n = 50 (%)	Staff Members n = 50 (%)
Daily sunscreen use		
Regular	15 (30)	21 (42)
Occasional	13 (26)	14 (28)
Never	22 (44)	15 (30)
Use of hat when outdoors		
Yes	12 (24)	2 (4)
No	37 (74)	43 (86)
Data unavailable	1 (2)	5 (10)
Use of umbrella when outdoors		
Yes	9 (18)	14 (28)
No	40 (80)	33 (66)
Data unavailable	1 (2)	3 (6)
Wearing protective clothing when outdoors		
Yes	25 (50)	17 (34)
No	24 (48)	28 (56)
Data unavailable	1 (2)	5 (10)
Staying out of the sun as far as possible		
Yes	43 (86)	41 (82)
No	7 (14)	6 (12)
Data unavailable		3 (6)

(80/100 or 80%) and light brown skin (43/99 or 43.4%), and were of Fitzpatrick skin types II/III/IV (72/98 or 73.5%). There were more staff members who had university and postgraduate qualifications (47.9% compared to 36.7%). On average, patients spent more time outdoors per week (8.72 hours compared to 6.76 hours). Notably, however, staff members sustained more sunburns over the past 1 year (0.94 burns compared to 0.67 burns). Three patients and 2 staff members reported a family history of skin cancer.

Baseline Sun Protection Behaviours

These are described in Table 2. Only one-third of the patients and less than half (42%) of the staff cohort applied sunscreen daily. Out of the 63 study subjects who used sunscreen, 42 or 66.7% elected to use sunscreens that offered a sun protection factor (SPF) of more than 30 whilst 15 or 23.8% used sunscreens with a SPF of 30. Although 86% of the patients and 82% of the staff members tried to stay out of the sun as far as possible, the vast majority of our study population did not use hats (80/94 or 85.1%) or umbrellas (73/96 or 76.0%) when outdoors. Most of the subjects also did not wear protective clothing, such as long sleeves and pants (52/94 or 55.3%).

Pre-Counselling and Post-Counselling Results

Before counselling, the mean score was 4.66/10 amongst patients and 8.14/10 amongst staff. The majority of patients (11/50 or 22%) attained a score of 4/10, whilst most of the staff members (27/50 or 54%) achieved scores of 7/10 to 8/10.

After counselling, more patients and staff gave appropriate responses to each question in the questionnaire. The mean score was 6.88/10 in the patient group and 8.7/10 in the staff group. A higher proportion of patients (14/50 or 28%) and staff members (19/50 or 38%) scored full marks.

Discussion

To our knowledge, this is the first study to evaluate the efficacy of a pharmacist-led sun protection counselling service in Asia.

In general, there is a need to improve sun protection behaviours and educate individuals about proper sunscreen application. Although 43 out of 50 patients (86%) and all staff members were aware that sun exposure increases the risk of skin cancer pre-counselling, only a third of the patients and less than half (42%) of the staff cohort used sunscreen daily. The most common reasons given for not

using sunscreen were inconvenience and the perception that applying sunscreen was not important. Amongst the 63 subjects who used sunscreen, many (55/63 or 87.3%) did not reapply the sunscreen at all and about half (31/63 or 49.2%) applied it only to selected areas such as the face. In addition, the vast majority of our study population did not use hats or umbrellas when outdoors, nor did most of them wear protective clothing.

Previous data has shown that adolescents tend to have the lowest sun protection rates.[2-4] As we had only 2 adolescents amongst our study subjects, this precludes us from drawing any definitive conclusions. Nonetheless, we had a 13-year-old girl with vitiligo who reported only occasional use of sunscreen, with no sun avoidance behaviours. Although it has been noted that women are more likely to adhere to photoprotection than men,[3,5-6] our study yielded mixed results. Our female subjects were more likely to use sunscreen daily and use umbrellas when outdoors, but fewer wore hats or donned protective clothing.

Based on the total and mean scores, it was encouraging to note that the group of staff members as a whole had better knowledge and understanding compared to patients before counselling. It was also reassuring to see that the 3 patients who had a family history of skin cancer all registered higher scores than the average (8-10 versus an average score of 4.66). We had 2 patients with basal cell carcinoma, and they performed well with a mean score of 8.5. However, 20 patients with rosacea, vitiligo, photoaggravated eczema, sunburns, lentigenes, melasma and actinic keratoses had low scores ranging from 2.67 to 5.4. This is a worrying observation, and reflects the need to improve patient education.

Amongst both patients and staff, the 2 questions with the most wrong answers prior to counselling were "Clothing of lighter colour has more UV protection as it reflects sunlight – false" and "A sunscreen with SPF 30 provides twice the protection as a SPF 15 – false". It is important to correct these misconceptions.

After counselling, there was an improvement in sun protection knowledge and awareness. More patients and staff gave appropriate responses to each question. The mean scores also improved from 4.66 to 6.88 in the patient group, and from 8.14 to 8.7 in the staff cohort.

Language barriers hindered our counselling service at times. The pharmacists also experienced time constraints in the setting of a busy tertiary dermatology centre.

This study is limited by its small sample size, and the potential for recall and selection bias. Our study subjects are specific groups, and staff at a dermatology centre may be more familiar with sun protection. Although this impacts the applicability of our results, we feel that our results can serve as a guide. There was missing data, which was taken into account during analysis of our results. Despite our results showing better knowledge immediately post-counselling, individuals may not retain this level of understanding over time and this may not necessarily translate into improved photoprotection behaviours as well. It would be helpful to reassess the subjects again after a year to check for retention of knowledge.

Conclusion

In conclusion, the implementation of a specialised pharmacist-led sun protection counselling service is potentially useful in the education of patients. Larger studies need to be done in a more heterogeneous population, and we hope to use these results to promote the establishment of similar services in other dermatology centres worldwide.

Acknowledgements

The authors would like to thank the following National Skin Centre pharmacists for their invaluable contributions to the study by administering the questionnaires and performing sun protection counselling: Lee Foon Tang, Elizabeth Tian, Winnie Choo, Winnie Li, Germaine Chua, Weiyu Chen and Charles Tan.

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Shan Xian Lee, [1]*MBBS, MRCP (UK)*,
Wei Sheng Chong,[2]*MMed (Int Med), MRCP (UK), FRCP (Edin)*,
Xiu Ting Lauw,[2]*BSc(Pharm)(Hons)*,
Siew Kiang Tan, [3]*MBBS, MMed (Int Med), MRCP (UK)*,
Hazel H Oon, [2]*MD, MRCP (UK), FAMS*

[1]Department of Dermatology, Changi General Hospital, Singapore
[2]National Skin Centre, Singapore
[3]Raffles Medical Group, Raffles Hospital, Singapore

Address for Correspondence: Dr Lee Shan Xian, Department of Dermatology, Changi General Hospital, 2 Simei Street 3, Singapore 529889.
Email: shan_xian_lee@cgh.com.sg

Appendix

1. **Sun exposure increases the risk of skin cancer.**
   TRUE/FALSE/NOT SURE
2. **You can get skin cancer on non-sun exposed areas.**
   TRUE/FALSE/NOT SURE
3. **Sun exposure during childhood is related to skin cancer in adulthood.**
   TRUE/FALSE/NOT SURE
4. **You do not need to apply sunscreen if you stay indoors as window glass absorb rays.**
   TRUE/FALSE/NOT SURE
5. **You only need to take sun protective measures when the sun is at its highest pe the day.**
   TRUE/FALSE/NOT SURE
6. **You do not need to reapply sunscreen if you use sunscreen with the highest SPI**
   TRUE/FALSE/NOT SURE
7. **Clothing of lighter colour has more UV protection as the clothing reflects sunlig**
   TRUE/FALSE/NOT SURE
8. **You do not need to apply sunscreen if you use a moisturiser or makeup contain sunscreen.**
   TRUE/FALSE/NOT SURE
9. **A sunscreen with a SPF of 30 provides twice the protection as a SPF 15.**
   TRUE/FALSE/NOT SURE
10. **You do not need sun exposure at all as sun exposure brings no benefits.**
    TRUE/FALSE/NOT SURE