

Introduction

We preach the importance of sun protection without considering the barriers patients face when attempting to find a cosmetically suitable sunscreen.

Visible light (VL) compromises 50% of sunlight. Mahmoud et al studied the effects of VL on the Fitzpatrick skin types (FST). They found it induced immediate pigmentation in FST IV-VI. No such pigmentation was found in FST II¹.

Traditional sunscreens provide protection against UVA and UVB radiation, reducing the risk of sunburn, skin cancers and photoaging but do not protect against visible light².

Iron oxide compounds found in tinted sunscreens protect against VL, however the shade options are scarce. As these sunscreens are tinted and must be opaque on application to confer photoprotection, the issue of cosmetic acceptability arises³.

We examined the cosmetic appearance of several popular sunscreens on the FSTs. We sought to determine how many acceptable options are available to members of each skin type.

This highlights the need for increased awareness of the sun protective needs of darker FSTs, and a tailored approach to sun protection in the modern world.

Methods and materials

Six participants recruited representing each FST

Thirty seven local pharmacies & supermarkets visited supplying the population of Galway city

Five company representatives contacted and asked to supply all sunscreens available

Twenty unique sunscreens were found including chemical, mineral and tinted sunscreens

Each was tested by applying half a teaspoon amount of product to the participant's forearm⁴

Each participant was photographed with all twenty sunscreens applied

Each participant was asked to note the following

1. Total number of tinted sunscreens applied they deemed cosmetically suitable for their skin colour and to provide an example of an acceptable and unacceptable tinted sunscreen
2. Total number of non-tinted sunscreens which left a white cast and to provide an example.
3. Overall number of sunscreens applied which were flattering on their skin and to provide an example of an acceptable and unacceptable sunscreen

Two researchers (S.H. and M.L.) objectively recorded the above in conjunction with the participants. A data analysis was completed using Microsoft excel

Results

Out of 37 pharmacies and supermarkets 12 (32%) had tinted sunscreens for sale. Of that 12, 7 provided two shades of tinted sunscreens and 5 provided a single shade.








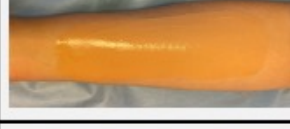



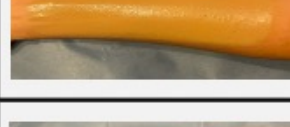
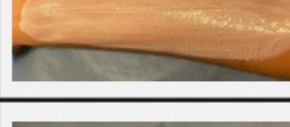

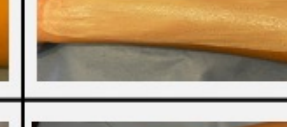

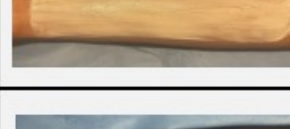

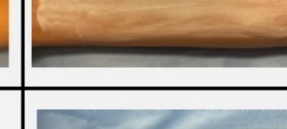

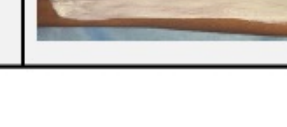
| Fitzpatrick skin type | Participant view | | | Researcher view | | |
|-----------------------|------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| | Total | Acceptable | Unacceptable | Total | Acceptable | Unacceptable |
| I | 5/20 |  |  | 9/20 |  |  |
| II | 10/20 |  |  | 13/20 |  |  |
| III | 9/20 |  |  | 10/20 |  |  |
| IV | 8/20 |  |  | 7/20 |  |  |
| V | 3/20 |  |  | 4/20 |  |  |
| VI | 0/20 | |  | 0/20 | |  |

Figure1. Participant view. Total number of all sunscreens found acceptable by the participant with an example of acceptable and unacceptable.

Researcher view. Total number of all sunscreens found acceptable by the researchers with an example of acceptable and unacceptable.











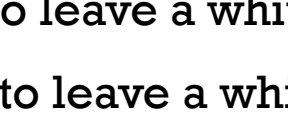
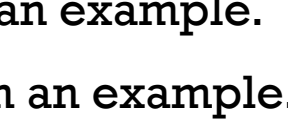
| Fitzpatrick skin type | Participant view | | Researcher view | |
|-----------------------|------------------|-------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|
| | White cast | Example | White cast | Example |
| I | 7/12 |  | 5/12 |  |
| II | 4/12 |  | 4/12 |  |
| III | 7/12 |  | 10/12 |  |
| IV | 9/12 |  | 9/12 |  |
| V | 11/12 |  | 10/12 |  |
| VI | 12/12 |  | 12/12 |  |

Figure2. Participant view. Total number of sunscreens found to leave a white cast by the participant with an example. Researcher view. Total number of sunscreens found to leave a white cast by the researchers with an example.

| Fitzpatrick skin type | Participant view | | | Researcher view | | |
|-----------------------|------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| | Tinted | Acceptable | Unacceptable | Tinted | Acceptable | Unacceptable |
| I | 0/8 | |  | 1/8 |  |  |
| II | 2/8 |  |  | 2/8 |  |  |
| III | 4/8 |  |  | 5/8 |  |  |
| IV | 5/8 |  |  | 7/8 |  |  |
| V | 2/8 |  |  | 2/8 |  |  |
| VI | 0/8 | |  | 0/8 | |  |

Figure3. Participant view. Total number of tinted sunscreens found acceptable by the participant with an example of acceptable and unacceptable. Researcher view. Total number of tinted sunscreens found acceptable by the researchers with an example of acceptable and unacceptable.

Discussion

Protection from the harmful effects of the sun is a right that should be unequivocally available to people of all skin tones and colours. Unfortunately, this is often not the case. As our society rapidly diversifies, we have seen the beauty industry work to meet demands for products that are inclusive to all skin shades. We can now find makeup products offering shade options for up to 50 skin colours and tones. In contrast, when we look to sunscreens, the options available are sorely disappointing.

Our study revealed that while all skin tones can struggle to find a flattering match, darker skin types are particularly challenged due to the often chalky or 'white cast' appearance of non-tinted sunscreens and a limited shade range of tinted sunscreens.

In total 8 tinted sunscreens were tested. FST IV found that 5 of 8 tinted sunscreens were cosmetically acceptable. 2 of the 8 matched FST V and 0 of the 8 matched FST VI. Our study highlights the lack of *easily accessible* tinted sunscreens available for those who require it most.

We also demonstrated the "white cast" phenomenon found with non-tinted sunscreens⁵. Commonly described in popular culture it is whereby the application of a sunscreen leaves behind a cosmetically unappealing whitish coat on the skin. This acts as a significant barrier against all skin types using proper photoprotection, and particularly against dark skin colours where the "white cast" appears more pronounced against a deeper complexion. 9, 11 and 12 out of 12 sunscreens left a white cast on FST IV and V and VI respectively.

We found that sunscreen products cater more to 'medium' skin tones with both extremes of skin types I and VI being marginalised.

Unappealing options of sunscreen, compounded by the common myth that darker skin types need less photoprotection leaves us with much to improve on in terms of sun protection for skin of colour.

Conclusions

While individuals with both fair and dark skin should continue to use sunscreens imparting UV protection, current guidelines should be updated to include emphasis on protection against VL in darker skin types. It is also evident we have much to improve on in our provision of sunscreen, which currently does not offer cosmetically suitable options to all skin types. We must advocate for sunscreen companies and manufacturers to work on expanding the shade range and formulations of both tinted and non-tinted sunscreens to achieve a comprehensive and tailored approach to photoprotection in the modern world.

References

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