“The dark side of sun avoidance”: Exploring Vitamin D deficiency in the era of photoprotection among the skin of colours — A review

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ABSTRACT

Introduction: The importance of photoprotective behaviours has become instilled among the society consistent with the increasing public knowledge regarding sun-induced skin damage. Although ultraviolet radiation (UVR) is infamously known for its sunburn, photoaging and malignant potentials, the skin undeniably also needs sunlight for the Vitamin D metabolism for bodily functions. The skin of color population (SOC) which naturally has increased protection against the sun making them more prone to having Vitamin D deficiency due to their slightly different skin from the lighter skin population. This scoping review aimed to explore the prevalence of photoprotective behaviours among SOC, their relevance and consequences on vitamin D metabolism. **Materials and Methods:** A scoping review was conducted across PubMed, Google Scholar and Scopus using predefined keywords. Eligible studies included those focusing on SOC populations, research that examined photoprotective behaviours and Vitamin D levels or metabolism and studies published in English or Bahasa Malaysia. The studies were excluded if they were to focus solely on lighter skin populations, articles that are not reporting outcomes related to Vitamin D, non-peer review studies and opinion pieces. **Results:** The review found that photoprotective behaviours are increasingly common among SOC population but may be influenced by culture, socioeconomic background, religion and geography. Common practices include sunscreen application, sun avoidance and wearing concealing clothing. However, sunscreen usage is still low among SOC population due to factors such as poor health literacy, misconceptions about sunburn risk and cosmetic concerns. Although photoprotection is effective in minimizing photoaging and pigmentary disorders among the SOC population, there is rising concern regarding lower serum Vitamin D levels following these behaviours. Melanin’s role as a natural barrier of skin may affect the effectiveness of photoprotection as it differs across skin phototypes as they have different degree of protection against the sun. This subsequently will impact the overall health status leading to various health problems. However, some studies suggest regular sunscreen use may not significantly impair the Vitamin D synthesis in healthy individuals of the SOC population. Still, this requires further research especially in Malaysia as a multiracial country with a population largely comprising of people of SOC with important consideration that they may have different photoprotection behaviour depending on their culture and religion for example Muslimah in Malaysia tend to wear protective clothing daily for religious reason. These issues need to be addressed properly as it may further impact vitamin D metabolism. **Conclusion:** This scoping review highlights the importance of balance between photoprotection and maintaining adequate sun exposure for Vitamin D metabolism especially among the SOC populations since they have different sunlight requirement compared to lighter skin phototypes. Hence, more education is needed with tailoring to the needs of their skin since there is limited research regarding this topic especially in multicultural countries like Malaysia in order to make sure they practice photoprotection without risking their overall health.

Keywords: Photoprotection, photoprotective behaviour, People of skin of colour (SOC), melanin, Vitamin D deficiency