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Developing the readiness to alter sun-protective behaviour questionnaire (RASP-B)

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ABSTRACT

Background: Australia has the highest incidence of skin cancer of any country in the world, even though the risk of contracting the disease can be lowered considerably by engaging in appropriate sun-protective behaviours. We aimed to construct and validate a questionnaire to assess the readiness of a group of mostly young people to change their levels of sun-protective behaviour by assigning them to a stage of change based on the transtheoretical model of behaviour change. *Method:* A sample of 122 undergraduate students in Queensland, Australia completed the readiness to alter sun-protective behaviour questionnaire (the RASP-B, a 12-item questionnaire about their attitudes toward sun-protection), in addition to a short questionnaire about their current sun-protective behaviours. *Results:* A principal component analysis revealed a clear three-factor structure corresponding to the precontemplation, contemplation, and action stages of the transtheoretical model. Participants in the action stage reported engaging in significantly higher levels of sun-protective behaviour than participants in the earlier precontemplation and contemplation stages. These behaviours included avoiding exposure to direct sunlight by wearing long-sleeved clothing and remaining in the shade or indoors. Participants in the different stages reported no significant differences in the reported frequency of sunscreen use, although respondents across all three stages reported using sunscreen infrequently. *Conclusion:* The RASP-B requires approximately 5 min to complete, can be self-administered and has satisfactory psychometric properties, and thus has utility in primary health care settings where time and client–practitioner contact are often limited.

1. Introduction

1.1. Sun-protective behaviour

The dangers associated with regular or prolonged sun exposure are well documented and include premature aging, sunburn and, most seriously, skin cancer [1–3]. Epidemiological evidence suggests that exposure to sunlight is associated with higher rates of all major types of skin cancer [4]. Approximately five percent of natural sunlight is composed of ultraviolet radiation (UVR), and it is this UVR which can cause skin cancer and other harmful damage to skin [5]. UVB radiation (the section of UVR consisting of wavelengths between 315 and 280 nm) is extremely effective at causing biological damage and accounts for approximately 80% of the most harmful effects associated with sun exposure, such as sunburn and skin cancer. UVA radiation (315–400 nm) contributes the remaining 20%, resulting in the less harmful effects such as wrinkles and skin discolouration. UVB acts as a carcinogen when it results in mutations in the DNA structure of skin cells. When these mutations affect the tumour-suppressive genes sufficiently to interrupt routine cell cycling, tumours are induced which may go on to form skin cancers [2,6].

Australia has the highest incidence of skin cancer of any country in the world and Queensland has the highest incidence of all Australian states and territories [7]. On average, two out of every three Australians will be treated for skin cancer at some stage during their lives [8] and it is estimated that approximately 80 percent of all new cancers diagnosed in Australia are skin cancers [9]. Although the incidence of skin cancer in Australia has plateaued since 1985, skin cancer still costs the Australian community more than AUS$300 million (€150 million) annually [10–12] as approximately 434,000 people receive treatment [8].

Each year in Queensland alone, over 2000 cases of skin cancer are diagnosed and over 200 deaths are attributed to the disease [13,14]. Incidence is highest in coastal regions (where sunbathing is commonplace) compared with the rural interior and an increased incidence during the 1960s and 1970s coincided with changes in fashion and social behaviour that led to young people spending more time in the sun with less protective clothing [7].

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It is the behavioural link between sun exposure and skin cancer which provides the most promising avenue for decreasing the incidence of skin cancer. The World Health Organization recommends several sun-protective behaviours including wearing protective clothing, staying in the shade, avoiding the sun in the middle of the day and regularly applying sunscreen when outdoors [15]. Since UVR passes easily through water, swimming in either the sea or open-air pools offers little protection against its damaging effects [5]. In light of this, many government health agencies have targeted behaviour change in terms of sun-protective and sun-avoidance behaviours as the primary means of mitigating skin cancer deaths [13,12,16,17].

Skin cancer research conducted in several Australian states has contributed to the development of various community campaigns, the aims of which are to reduce the incidence, morbidity and mortality of skin cancer by changing attitudes and behaviours, as well as controlling existing disease [12]. For example, each year, the Skin Cancer Foundation of Western Australia spends more than AUS$1.2 million (€600,000) on research into skin cancer and the prevention campaigns that have stemmed from this research have helped to change the way individuals living in Western Australia perceive, and behave in, the sun [17]. This, in turn, has contributed to a reduction in age-standardised rates of skin cancer reported during this period [18]. In Queensland, the current state-wide "Sun Safety" campaign provides sun-related information to schools, workplaces, health professionals and the general public, and reminds residents that the Queensland sun can inflict the same damage during winter as it can during summer [16]. Much of this campaign specifically addresses people in the 18–30-year-old age group. National research has suggested that campaigns such as these have combined to play an important role in altering Australian society's perceptions of the dangers associated with sun exposure and have contributed to significant reductions in sun exposure in several Australian states [12].

Despite some 30 years of sun-protection promotion campaigns, skin cancer still poses a significant public health risk in the state of Queensland. Young people, such as university students, may still be at an increased risk of developing skin cancer, as many young people associate a suntan with an attractive and healthy appearance [9,19]. They also often have fewer occupational commitments and an increased capacity to spend time outdoors exposed to the sun when compared with average members of the workforce. As the effects of UVR in causing skin cancer are cumulative, it is anticipated that reducing sun exposure early in the lifespan would retard the rate of tumour development throughout the lifespan [2]. Assessing university students' beliefs and behaviours about sun-protection is therefore an important area of research.

The continuing high incidence of risk-taking behaviours related to sun exposure amongst university-aged individuals [9] suggests that more than just informational and scare campaigns are required to change behaviours. This is especially true amongst young people. One approach is to take into account the current state of the individual and target behaviour change messages to their readiness to accept different types of information.

1.2. The transtheoretical model of behaviour change

The transtheoretical model of behaviour change (hereafter TTM) proposed by Prochaska and DiClemente [20] has gained widespread acceptance in the health psychology literature. It has been used effectively in explaining the pattern of acquisition and cessation of a variety of potentially health-compromising behaviours, including sun exposure [21], smoking [22], excessive alcohol consumption [23], and the misuse of both licit and illicit drugs [24] (also see [25] for a comprehensive review). The TTM details six stages of change: precontemplation (not thinking about change), contemplation (seriously considering change), preparation (planning to change in the foreseeable future), action (initiation of overt behaviour change), maintenance (sustained behaviour change over at least 6 months), and termination (return to pre-morbid behaviour, as though never having changed the behaviour in the first place). It is hypothesised that individuals progress sequentially through these stages during the process of reducing or eliminating health-compromising behaviours [26]. One of the unique advantages of the TTM is that it addresses the transitional nature of change and unlike competing theories, does not assume any pre-existing level of willingness to change. This suggests that even individuals in the precontemplation stage, who are not concerned about their health-compromising behaviour and display no evidence of a desire for change, can benefit from an intervention tailored specifically for such a population. Such targeted interventions assume, however, that the stage of change a person has reached can be accurately assessed [23].

1.3. Sun-protective behaviour and the TTM

Despite the benefits associated with engaging in sun-protective behaviour, there is currently no questionnaire in the literature that accurately assesses how willing individuals are to change their current levels of sun-protective behaviour. When consideration is given to the fact that such a questionnaire could feasibly be used in the planning and development of effective interventions (and their subsequent evaluations), it becomes apparent that this absence needs to be addressed. Several studies have attempted to assign individuals to a stage of change in relation to sun-protective behaviour using a variety of methods [21,27–34], though these studies have typically contained a number of methodological limitations. These limitations include attempting to assess and alter numerous behaviours simultaneously (thereby dedicating less attention to sun-protective behaviour) [31,35], assigning participants to a stage of change on the basis of their responses to only a small number of questions [21,28,29,36], and utilising female-only samples [27]. In a large descriptive study by Weinstock and colleagues [34], over 2000 beach goers were individually interviewed regarding their sun-protective behaviours and assigned to stages of change corresponding to the TTM. They reported relationships between stages of change and sun-protective behaviours consistent with the TTM. The only limitation of this study is the interview method employed, which is costly and time consuming as well as being unsuitable for large-scale interventions. Finally, several of the aforementioned studies were conducted in Sweden [21,27–29] and, given the differences between the Swedish and Australian climates, likely sun exposure behaviours and the perceived risk of skin cancer, it would be inappropriate to generalise the results of such studies to the Australian population.

Accurately assessing an individual's current stage of change in relation to sun-protective behaviour – and providing feedback and education in relation to such behaviour – could potentially serve three primary functions; firstly, it may help to increase the individual's level of sun-protective behaviour, which would decrease their likelihood of contracting skin cancer. Secondly, it may help to decrease the individual's level of deliberate sun exposure, further decreasing the risk of contracting skin cancer. Finally, it may contribute to more efficient and effective use of time allocated to health promotion interventions in primary health care settings; after all, if the treating health professional is already aware of which stage of change the client is in, an intervention targeted specifically at that stage could be implemented with maximum efficiency and minimal delay. When it is considered that approximately 40% of at-risk individuals for a particular health-