Research Article

Validity and Reliability of Sun Protection Behavior Scale among Turkish Adolescent Population

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S U M M A R Y

Purpose: The aim of this research was to adapt the Sun Protection Behavior Scale (SPBS) to Turkish and to perform validity and reliability analyses.
Methods: The scale was administered to a total of 900 adolescents, the retest to 91 adolescents. The construct validity of the scale was evaluated using exploratory (EFA) and confirmatory factor analysis (CFA). The EFA and CFA were applied to sample groups of 449 and 451 people, respectively.
Results: The Cronbach alpha coefficients for the Turkish form of the SPBS ($\alpha = .74$) and its sunscreen ($\alpha = .88$) and hat use ($\alpha = .70$) subscales were found to be $\geq .70$ while the sun avoidance subscale was calculated to be .67. The item-total score correlation between the scale and its subscales was $\geq .26$ and the test-retest correlations were found to be $\geq .51$. The CFA results verified the 8-item, 3-factor Turkish version of the SPBS. The confirmatory factor loadings for the scale were .45—.80 for sun avoidance, .72—.93 for sunscreen use, and .66—.83 for hat use. In particular, SPBS and sunscreen use ($p < .001$) exhibited significantly high mean scores among girls and economically better backgrounds ($p = .007$, $p < .001$, respectively). In addition, SPBS ($p = .004$) and hat use ($p < .001$) revealed that the mean scores were significantly high in younger adolescents.
Conclusions: The SPBS was found to be valid and reliable and its psychometric characteristics acceptable. The scale can be used to measure the behavior of Turkish adolescent populations with respect to sun protection.

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Introduction

The incidence of skin cancers has steadily increased over the past 50 years in predominately fair-skinned populations. This increase is reported to have leveled off recently in several northern and western European countries, Australia, New Zealand and in North America [1].

While the rate of standardized melanoma relative to age in Turkey in 2004 was 1.5 in 100,000 in men and 1.2 in women, in 2009 these rates rose to 2.1 in men and to 1.6 in women. The rate of nonmelanoma skin cancers, meanwhile, was 20.8 in and 14.5 in women per each 100,000 of the population in 2004, but rising to 24.0 in men and 15.8 in women in 2009. As can be seen from this data, there has been a striking rise of both melanoma and non-melanoma skin cancer cases in Turkey [2].

The popularity of getting a tan, particularly the wide interest in this trend among young girls aged 14—16 years, the psychological motivation to look beautiful, the belief that a tan is a sign of health, as well as the increase in vacation and leisure-time activities have all resulted in an increased impact of ultraviolet rays on human health [3]. Parallel to these changing trends in the population, skin cancer risks associated with unprotected exposure to long-term, intermittent or intense sunrays and a history of sunburn in childhood have increased [4].

The Turkish population is constantly subjected to a high level of ambient ultraviolet radiation throughout the year. Ultraviolet index values in central Turkey, in the region of the country's capital Ankara, are 8—10 in the summer months, 4—6 in the spring. In the period of April—September, values rise above 4, which is considered to be a baseline for sun protection [5].

In one review, sun protection educational programs are recommended in adolescence because of their benefits in terms of

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skin cancer protection and their effectiveness in establishing sun protection behavior changes in adolescents [6]. Another review has emphasized the importance of the key role nurses may play in health maintenance and improvement programs that help protect the community from skin cancers [7]. Because of their position as a major professional group in health services, nurses are advised to play an active role in schools in skin cancer prevention programs [8].

Determining the nature of the sun protection behavior of individuals, particularly of children and adolescents, may form the basis of planning interventional studies and health improvement programs [9,10]. Sun protection was measured using the 9-item Sun Protection Behavior Scale (SPBS), which evaluates how individuals protect themselves from the sun [11-13]. The SPBS included questions assessing the frequency of sun protective behaviors (e.g., frequency of wearing hats, using sunscreens, time spent in the shade), such that higher scores reflected greater frequency of sun protective behaviors. Each item was a self-report of behavior on a 5-point Likert scale of frequency (*never, rarely, sometimes, often,* and *always*), "when in the sun for more than about 15 minutes". The SPBS included components of sun avoidance, sunscreen use, and hat use, and has been shown to be reliable and valid [14], as well as sensitive to intervention effects in adolescents and adults [11,13].

In Turkey, 30.0% of the population is made up of children aged 0—17 [15]. Some descriptive and cross-sectional studies conducted in Turkey have revealed that the knowledge, attitudes and behaviors of individuals, especially of children, regarding sun protection are insufficient and reportedly, the methods of protecting children from the sun are inadequate [16,17].

In a study conducted in Turkey, researchers found that the sun protection behavior scores of elementary school children were low and that the method used the most was staying in the shade in the peak sunlight hours and wearing light-colored clothes [17].

Although there have been many studies on skin cancer in Turkey, it is worthy of note to acknowledge that no common data collection form that measures sun protection behavior among elementary school children has been used and that researchers have used different questionnaires that they have themselves devised. The differences in data collection therefore have made it difficult to reach a common conclusion [18]. It was for this reason that the need arose to create a Turkish version adaptable to the Turkish adolescent population, of the SPBS that is being used in many interventional studies in the American population [11,13].

The main purpose of this study was to make a cultural adaptation and perform psychometric analyses of the SPBS. In this context, the aims of the study can be summarized as the following: (1) translating the SPBS from English to Turkish; (2) assessing the instrument's item-total correlations, internal and test-retest reliability; (3) replicating the factor construct for the instrument; (4) reporting the prevalence of sun protection behavior for Turkish adolescents.

Methods

Study design

This study was a methodological study to evaluate reliability and the factor construct of the SPBS.

Setting and sample

The study was conducted in Sakarya Province, located on the coast of the Black Sea in the Marmara Region of Turkey. The climate is oceanic due to its close proximity to the Black Sea. The research was carried out using the random cluster sampling method. In this context, sixth to eighth grade students from 32 public elementary schools in the region comprised one cluster, and sixth to eighth grade students from 8 private elementary schools made up the other cluster in the study. A school was chosen randomly from each cluster. Ultimately, the study sample comprised 1060 students, 640 from the public school and 420 from the private elementary school. The students were all in the sixth to eighth grades and between the ages of 12—15 years. Consent forms were sent out via the children to parents, together with an introductory letter explaining the purpose of the study. The parents then filled out the forms at home and returned the materials. The 900 parents were thus contacted and the consent of all was received before the start of the study. The final study sample was made up of 574 students from the public school and 326 students from the private school. Two weeks after the implementation of the research questionnaires, a posttest was administered to two random classes from each school. In the posttest, the aim was to use parametric measurement methods in hypothesis testing without interfering with school activities. Therefore, it was established that 90 students that made up 10.0% of the sample were sufficient for the study. At this stage, the posttest was administered to 58 public school and 33 private school students. A power analysis was carried out for the study (80.0% power and a level of significance of 0.05). We found that 429 participants would be adequate for this study.

Ethical consideration

The authors of the original instrument contacted Jay E. Maddock for permission to use the instrument. Permission to conduct the research in the schools was also obtained from the school administrations and the local education authority. Institutional review board approval was obtained prior to the study (2013-5).

Instrument: SPBS

The information sheet that was used in the research contained descriptive information about age, economic status and skin type of the students. The other data collection instrument that was used in the study was the SPBS.

The SPBS is a 9-item Likert type of scale developed to measure how often individuals engaged in sun protection behaviors [14]. The SPBS examines how often the individual engages in sun protection behavior at times when exposure to the sun is more than 15 minutes, such that 1 represented *never*, 2 represented *rarely*, 3 represented *sometimes*, 4 represented *usually*, and 5 represented *always*. The higher scores in the scale and in each item indicate better sun protection behavior. The scale has three subscales, including regular sun avoidance, sunscreen use and hat use. The minimum score on the SPBS was 9; the maximum score was 45. The minimum score for sun avoidance was 4; the maximum 20. The lowest mean score for sunscreen use was 3; the highest was 15. The lowest mean score for hat use was 2; the highest was 10. The SPBS was applied to an adolescent population by Maddock et al [14] and the 3-factor construct made up of the subscales of sun avoidance, sunscreen use and hat use was validated [14,19]. SPBS was used in a beach community where only two of the subscales (sunscreen use, $\alpha = .86$ and sun avoidance $\alpha = .82$ reliable) were found to be reliable [12]. A 7-item SPBS with two subscales was used with adolescents; Cronbach α ($\alpha = .78$) and test-retest reliability ($r = .70$) were found to be good [20].