

Article

Validation of the Sun Exposure and Protection Index (SEPI) in Greek: An Instrument for Measuring Children's Sun Protection Propensity

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Abstract: Skin cancer, the most common type of cancer worldwide, has been linked to overexposure to ultraviolet radiation (UVR) without protection. As skin cancer is a preventable type of cancer, there is a pressing need to adopt health-promoting behaviors early in life. The Sun Exposure and Protection Index (SEPI) is an instrument for evaluating adults' sun exposure habits and the propensity to increase sun protection with widely accepted validity and reliability in Swedish, English, and German. The present study aims to validate SEPI with children in Greek. Data was collected from 127 primary school students in Cyprus who completed the instrument twice within two weeks. Internal consistency calculated by Cronbach's alpha was 0.69 for all 13 items included in SEPI. A statistically significant ($p < 0.01$) strong and positive correlation coefficient (Pearson's $r = 0.63$) was measured between the total scores for parts 1 and 2. Test-retest stability was high and significant ($\rho > 0.5$, $p < 0.01$) for all items but one. In conclusion, the Greek version of SEPI demonstrates reasonable internal consistency, as Cronbach's alpha is at a relatively acceptable level. It can be used for evaluating prevention interventions assessing sun exposure habits, and the propensity to increase sun protection among primary school students.

Keywords: ultraviolet radiation (UVR); children; UVR protection attitudes; habits; behaviors; questionnaire; validity; reliability



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1. Introduction

The prevention of cancer has become one of the most significant public health challenges for the 21st century and partially contributes to achieving the third of the 17 Sustainable Development Goals (SDGs) aiming to ensure healthy lives and promote well-being for all people at all ages. According to the World Health Organization, skin cancer is considered the most common type of cancer worldwide, with approximately more than 1.5 million new cases in 2020 (<https://www.iarc.who.int/>) (accessed on 2 December 2022) [1]. In countries close to the equator and with a high level of ultraviolet radiation (UVR) all year round, such as Cyprus, skin cancer is a growing concern. The Cancer Archive in the Cypriot Ministry of Health refers to melanoma as the eighth most common cancer in males and the tenth most common cancer in females [2]. One out of a 100 Cypriots is expected to develop malignant melanoma throughout their life, an increased probability comparatively with the year 1950 when this probability was calculated to one out of 1250 people, based on data from the Cyprus Association of Cancer Patients and Friends [2]. Kyprianou et al. (2022) warn that as Cyprus is a country with a high UVR index, it is expected to be highly and further affected by climate change, and melanoma will likely become an increasing public health problem [2].

Researchers point out that the leading environmental cause of nonmelanoma and melanoma skin cancer is excessive exposure to ultraviolet solar radiation without protection under the age of 20 [3–6]. Given the fact that skin cancer is a preventable type of cancer,

there is a pressing need to adopt health-promoting behaviors; this is clearly stated by Dr. Maria Neira, WHO Director in the Department of Environment, Climate Change, and Health, who explained that “people need to know when and how to protect themselves from solar radiation since excessive exposure to ultraviolet solar radiation is the main cause of skin cancer” (World Health Organization, 2022).

Children are considered a high-risk population group, and they are more vulnerable to the harmful effects of UVR sun exposure [7,8] since approximately 50–80% of the skin’s sun damage occurs in childhood [9]. Hence, cancer prevention efforts should be directed at children and youth [10–12]. Children should be targeted because preventive behaviors initiated early in life regarding the dangers of UVR sun exposure, such as wearing sunscreen, hats, shirts, and sunglasses [13,14], are established as consistent patterns of healthy behaviors in adult life [15,16].

Given that self-directed sun protective behaviors in children are difficult to achieve [17] and given the importance of raising preventive sun protection behaviors, the measurement of these behaviors is considered a priority in national surveys for evaluating preventive intervention efforts [13]. No gold standard for assessment of sun exposure and protection practices exists (to date) [18,19]. Nevertheless, the effects of preventive interventions are usually evaluated with questionnaires. Some teaching interventions related to sun protection used questionnaires that were validated to record a change in knowledge, attitudes, and sun-protective behaviors before and after an educational intervention aiming at higher knowledge and healthier attitudes and behaviors [20–24]. Teaching interventions related to sun protection vary considerably [25]. Measurement concerns were frequent in reviews of skin cancer prevention for children where there were no estimates of reliability for measures used [3]. Many studies analyzed individual items or did not report the reliability of multi-item indices. Generally, the reliability of the questionnaire items has ranged from marginally adequate ($r = 0.55$ – 0.70) to acceptable ($r > 0.70$) [3]. Only a few of the questionnaires used for recording sun exposure attitudes and behaviors were tested for validity [26] while others are extensive and time-consuming [18] and therefore inappropriate for young children. Eight validated questionnaires used to evaluate preventive interventions with primary school students were reported in a recent review by Theodosi and Nicolaidou (2022) [25]. These questionnaires were used to record UVR attitudes and behaviors among primary school children [4,27,28] and a change to healthier behaviors after an educational intervention [20–24]. However, a critical comparison of the previously mentioned validated instruments revealed that they all focused on measuring sun protective behaviors and selective attitudes, primarily referring to sun tanning. Therefore, there is a need for validated and reliable instruments broadly measuring sun exposure habits and behaviors for epidemiologic and experimental studies [29]. The Sun Exposure and Protection Index (SEPI) has been developed specifically for this purpose and has only been used by adults thus far. SEPI is a brief instrument for measuring both sun exposure and protection habits and the propensity to change patterns of yielded behaviors concerning sun protection. This makes it ideal for examining the effect of prevention interventions designed to influence children’s attitudes toward UVR protection. SEPI is a viable and easily accessible tool applicable to evaluate individual sun exposure and protection in populations exposed to different UVR environments such as Australia and Northern Europe [18]. SEPI was originally developed in Swedish, and it has been translated into English and German [18].

Even though studies have shown that SEPI is both valid and reliable and can be used as a measurement tool in research studies appraising sun exposure, this was not previously used or validated with children, and it was not translated into Greek. The novelty of this work is the use and validation of the SEPI measurement tool with children for the first time to determine its appropriateness for this age group. Thus, the present study aims to investigate the validity and reliability of a Greek translation of the SEPI questionnaire for use in experimental studies in Greek-speaking populations, specifically to measure the effect of educational interventions aiming at healthier sun-related attitudes and behaviors. The study’s main research question is the following: To what extent is the Greek translation

of the SEPI questionnaire valid and reliable? Specifically, what is the evaluation of the internal consistency of the Greek translation of the SEPI questionnaire (validity), and what is the evaluation of its stability over time (reliability)?

2. Materials and Methods

SEPI, a brief instrument used for evaluating sun exposure and protection habits and the propensity to increase sun protection, consists of two parts. The first part aims to address participants' sun exposure and protection habits. It includes eight close-ended questions based on a five grade Likert scale (0–4 points) with an overall score of 0–32 points. A high score on the first part indicates high ultraviolet radiation exposure habits [18]. An example of an item from the first part of SEPI is the following: "How often do you sunbathe with the intention of getting tanned? (0: never, 1: rarely, 2: sometimes, 3: often, 4: always)".

The second part examines the propensity to increase sun protection. It is based on the transtheoretical model of behavioral change (TTM). It includes five close-ended questions based on a five grade Likert scale (0–4 points) with a total score of 0–20 points. A high score on the second part indicates a low propensity to increase sun protection [18]. An example of an item from the second part of SEPI is the following: "For sunbathing: 4: I have never thought of giving up sunbathing, 3: I could think of giving up sunbathing, 2: I intend to give up sunbathing, 1: I have recently given up sunbathing, 0: I have for a long time avoided sunbathing." The same structure is used for the remaining four items of the second part, asking students to think of their intention to use protective measures such as sunscreen use, covering clothes, use of hat or cap, and seeking shade. SEPI can identify high-risk individuals with respect to their sun-related attitudes and behaviors and can be used for evaluating preventive interventions [18]. It is considered a reliable instrument with an overall high acceptance of validity and reliability. With respect to SEPI's internal consistency in terms of Cronbach's alpha for each part, this was determined up to 0.70 for the first part and to 0.72 for the second part in a German population [29]. Lower values were reported in Australian and Swedish populations. Specifically, regarding its internal consistency, Cronbach's alpha was valued at 0.69 in Australia and 0.61 in Sweden for SEPI's first part and up to 0.67 in Australia and 0.57 in Sweden for the second part [18]. Regarding the test's stability as analyzed with Spearman's Rho, high correlation coefficient values were obtained for all questions in both parts of SEPI for both Australian and Swedish populations [18]. In the German population, seeking shade was the only item valued below 0.6 based on a weighed Kappa analysis [29].

This study investigates the validity and reliability of a Greek translation of SEPI to be used in Greek-speaking populations (Supplementary Material for SEPI in English and in Greek). For SEPI to be translated into Greek, a translation–back translation procedure like that used by Karlsson et al. (2020) was applied. As Karlsson et al. (2020) emphasize, a translation of the original English version of SEPI in the children's native language needs to be done as a first step [29]. Therefore, a Greek translation of SEPI was performed by the first author. Then, the Greek version of SEPI was translated back into English by two different native English speakers who worked independently and were unfamiliar with the English version of SEPI. The next step was a comparison of both translations in terms of agreement with one another and with the original English version. Both translations' level of agreement was high, revealing that the content of the questionnaire was preserved throughout the translation procedure. Lastly, the second author performed pilot testing with a small number of children (10–11 years old) to ensure comprehensibility and face validity [29]. Minor changes were made after the pilot testing in wording to simplify difficult words by replacing them with synonyms and enhance the comprehensibility of certain items pinpointed as difficult to comprehend by the children participating in pilot testing.

For the validation process to be conducted, a total of 144 upper primary school children (10–12 years old) from two primary schools in Cyprus were invited to participate in the study through convenience sampling. Specifically, 34 fourth graders, 72 fifth graders, and

38 sixth graders were invited to participate in the validation process with a proportion of 68 girls and 76 boys. A test–retest procedure was performed to evaluate the stability of the Greek translation of SEPI. Two weeks after the children’s first completion, they were asked to complete the questionnaire again. This allowed a comparison of answers provided by each participant. A unique number was given to each participant to preserve students’ anonymity and to pair up participants’ questionnaire responses. The questionnaire was completed by 136 participants in the first administration occasion and 127 participants in the second follow-up procedure. Only students who completed both questionnaires were included in this study ($n = 127$).

For data analysis, the Cronbach’s alpha measure was used to assess SEPI’s internal consistency for both parts of the instrument relying on participants’ test responses as other research studies suggested [18,29]. For studies conducted in social sciences, a value of $\alpha \geq 0.7$ indicates good internal consistency. Test–retest procedure was followed, and the correlation of participants’ responses was investigated by determining the degree of agreement for each item in the two administration occasions to evaluate stability over time by using Spearman’s Rho correlation analysis. Pearson’s correlation analysis was used to measure the relationship between both parts of SEPI, whereas a positive coefficient value of r between 0.1–0.3 was interpreted as small correlation, 0.3–0.5 as moderate, and 0.5–1.0 as high correlation. For all statistical analyses, SPSS 26.0 software was used, and an alpha level of 0.05 was chosen a priori.

3. Results

Participants in the study were 127 primary school students (64 male and 63 female), with 8.6% being 9-year-olds, 38.5% 10-year-olds, 38.5% 11-year-olds, and 14.1% 12-year-olds. The results of the study’s two research questions are presented in the following sections.

3.1. Research Question 1: Validity of the Instrument (Internal Consistency)

The first research question of the study refers to the evaluation of the validity of the Greek translation of the SEPI questionnaire, which was examined by calculating the instrument’s internal consistency. Cronbach’s alpha analysis was used to calculate SEPI’s internal consistency for all 13 items included with the level of alpha calculated to 0.69. A Cronbach’s alpha coefficient value above 0.7 is interpreted as an expression of good internal consistency [18]. Cronbach’s alpha analysis was also used to identify internal consistency for both parts of SEPI; the first identifying participants’ sun exposure habits and the second part identifying participants’ propensity to increase sun protection. Internal consistency was calculated for each subscale in SEPI (Table 1).

Table 1. Internal consistency for sun exposure and protection habits (SEPI Part 1).

	Cronbach’s Alpha ($n = 127$)
Value for SEPI Part 1 total score	0.482
Value after the deletion of a single item, as follows:	
1. How often do you sunbathe with the intention to get tanned?	0.488
2. How many times have you been sunburnt (redness and pain) during the last 12 months?	0.525
3. How long do you usually stay in the sun (on average) between 11 am and 3 pm?	0.389
4. How often do you take a holiday with the intention of spending more time in the sun?	0.441
5. When in the sun, how often do you use sunscreen?	0.432
6. When in the sun, how often do you use covering clothes for protection?	0.469
7. When in the sun, how often do you use a hat for sun protection?	0.394
8. How often do you stay indoors or in the shade to protect yourself from the sun?	0.433

With respect to SEPI's first part, Cronbach's alpha was estimated to be 0.482, with the second item referring to the number of sunburns in the last 12 months being the only item rendering a higher internal consistency up to 0.525 if excluded from the scale; this can be viewed in Table 1. Cronbach's alpha ranged from 0.389 (item 3), which was the lowest value, to 0.525 (item 2), which was the highest value (Table 1).

For SEPI's second part, Cronbach's alpha was calculated to be 0.510, with the item concerning sunbathing being the only item rendering a higher internal consistency up to 0.542 if excluded from the scale; this can be seen in Table 2. Cronbach's alpha ranged from 0.379 (item 5), which was the lowest value, to 0.542 (item 1), which was the highest value.

Table 2. Internal consistency for participants propensity to increase sun protection (SEPI Part 2).

Cronbach's Alpha ($n = 127$)	
Value for SEPI part 2 total score	0.510
Value after the deletion of a single item, as follows:	
1. Sunbathing	0.542
2. Sunscreen use	0.402
3. Covering clothes	0.510
4. Hat or cap usage	0.407
5. Seeking shade	0.379

Considering the small number of items included in both subscales of SEPI, eight items investigating participants' sun exposure and protection habits in the first subscale (Part 1) and only five items included in the second subscale (Part 2) reflecting participants' propensity to increase sun protection, the reported Cronbach's alpha $\alpha > 0.5$ is considered acceptable [30–32].

3.2. Validity of the Two Parts of the Instrument: Correlation between SEPI Parts 1 and 2

For investigating the correlation between the two parts of SEPI, Pearson's correlation analysis was used, and a total number of 127 participants were included for whom values in both parts of SEPI were filled in. According to the results, the correlation between the total score in SEPI for parts 1 and 2 was strong and positive ($r = 0.63, p < 0.01$). This means that the higher the students' sun exposure, the better their protective habits. Conclusively, the two parts of SEPI had a statistically significant, positive, and strong correlation, suggesting that participants' sun exposure and protective habits tend to increase according to their propensity to increase sun protection.

3.3. Research Question 2: Reliability of the Instrument (Stability over Time)

The study's second research question refers to the evaluation of the reliability of the Greek translation of the SEPI questionnaire, which was examined by calculating its stability over time. To evaluate the questionnaire's stability over time, a test–retest analysis was conducted with Spearman's Rho analysis by matching participants' answers in the first administration occasion and their answers obtained two weeks later in the second administration occasion. With respect to items included in SEPI's first part, investigating sun exposure and protection habits, high and significant correlation coefficient values were observed in general ($\rho > 0.5, p < 0.01$), except for the question "When in the sun, how often do you use covering clothes for protection?" where a $\rho = 0.383$ was obtained (Table 3).

Table 3. Stability over time for sun exposure and protection habits (SEPI Part 1).

	Correlation Coefficient (Spearman's Rho)
1. How often do you sunbathe with the intention to get tanned?	0.695 **
2. How many times have you been sunburnt (redness and pain) during the last 12 months?	0.685 **
3. How long do you usually stay in the sun (on average) between 11 am and 3 pm?	0.566 **
4. How often do you take a holiday with the intention of spending more time in the sun?	0.565 **
5. When in the sun, how often do you use sunscreen?	0.681 **
6. When in the sun, how often do you use covering clothes for protection?	0.383
7. When in the sun, how often do you use a hat for sun protection?	0.600 **
8. How often do you stay indoors or in the shade to protect yourself from the sun?	0.605 **

** $p < 0.01$.

Referring to the items exploring participants' propensity to increase sun protection with items included in the second part of SEPI, high and significant correlation coefficient values ($\rho > 0.5$, $p < 0.01$) were observed for all questions, as can be viewed in Table 4. The lowest observed correlation coefficient value was 0.51 for item 3, and the highest was 0.61 for item 4.

Table 4. Stability over time for participants' propensity to increase sun protection (SEPI Part 2).

	Correlation Coefficient (Spearman's Rho)
1. Sunbathing	0.560 **
2. Sunscreen use	0.666 **
3. Covering clothes	0.508 **
4. Hat or cap usage	0.607 **
5. Seeking shade	0.638 **

** $p < 0.01$.

4. Discussion

Children are targeted in prevention interventions aiming to increase their UVR protection attitudes and behaviors for several reasons. Firstly, children are more vulnerable to the harmful effects of UVR sun exposure. Secondly, children can be easily influenced to take actions to protect themselves from the high danger of UVR sun exposure. Therefore it is important to raise awareness for UVR protection and promote healthier attitudes and behaviors as early in life as possible [15,16]. This work aimed to validate SEPI in Greek for use by young children of the 4th–6th grade of primary school as part of studies that aim to document children's attitudes or/and evaluate the impact of prevention interventions to increase UVR protection [17,25]. The first research question of the study focused on the instrument's validity and internal consistency. Even though the internal consistency by Cronbach's alpha for the baseline responses was 0.687 for all 13 items of SEPI, indicating acceptable levels, the internal consistency of each part taken separately was lower (0.482 for part 1 and 0.510 for part 2) compared to previous studies examining the validity of the same instrument [18,19,29]. This may potentially be attributed to the fact that in all three previous studies on SEPI's validation in different languages [18,19,29] the population of interest was adults [31]. This was the first study attempting to validate SEPI using children as the population of interest.

Internal consistency reflected by Cronbach's alpha in each one of the two individual parts turned out to be lower than the desired > 0.70 coefficient value generally recom-

mended. This finding, however, is in line with the findings of the sample of patients rather than students reported in the validation of SEPI study of Detert et al. (2015) [18]. In this sample, the reported Cronbach's alpha was as low as 0.43 in the first part of SEPI for Australian patients (Detert et al., 2015, p. 990) and as low as 0.55 in the second part of SEPI for the same target group (Detert et al., 2015, p. 991). It seems that when the target population changes from a general population to a population with unique characteristics (e.g., primary health care patients, as in the study of Detert et al., 2015 [18]) or young children, as in our study, it is more difficult to achieve acceptable values for the Cronbach's alpha coefficient.

Moreover, SEPI is a brief instrument consisting of thirteen items in total; eight items examining participants' sun protection habits and five items examining participants' propensity to increase sun protection. Thus, coefficient values for alpha lower than the desired values of > 0.70 are justifiable, taking into consideration that Cronbach's alpha is number-sensitive, with the reliability of a scale being intuitively better when more items are included in it [30]. As Schrepp (2020) notes, a large number of items included in an instrument results in a larger value for Cronbach's alpha, whereas a small number of items results in a smaller Cronbach's alpha [30]. Other researchers agree that a scale's low reliability could be explained by the small number of items describing the scale [33]. Thus, an instrument with a quite low alpha value can still be useful [32], with Cronbach (1951) stressing the importance of obtaining interpretable results when using an instrument rather than high values for alpha.

The second research question of the study focused on the instrument's reliability. In the present study, SEPI was proved to be stable and reproducible with significant moderate to high coefficient values observed in test-retest analysis calculated with Spearman's Rho. This result is enhanced by other research studies proving the reproducibility of SEPI [18,29]. Only one item included in part 1 for investigating participants' sun exposure and protection habits obtained a low correlation coefficient, specifically the following: "When in the sun, how often do you use covering clothes for protection?" ($\rho = 0.383$) while all other items obtained moderate to high coefficient values. A similar result was obtained by Karlsson et al. (2020) [29], who observed that the item included in part 1, referring to vacational sun exposure, was the one with a low correlation coefficient value in their study. Despite this, SEPI can be a useful instrument "for a follow up of a given sun protection directed intervention" (p. 7) even though an item obtained a low correlation coefficient value. As Karlsson et al. (2020) [29] explain, SEPI can be used by researchers both as a global score or as a way to focus on individual questions and behaviors, which is a clear advantage in comparison with previous instruments [18,19]. This is in line with the present study's results that reveal a statistically significant positive, strong correlation between the two parts of SEPI. This suggests that participants' sun exposure and protection habits reflect their propensity to increase sun protection since a risky behavior, indicated by a high score in part 1, reflects a low propensity to increase sun protective behaviors, indicated by a high score in part 2.

The present study indicated the validity and reliability of the Greek translation of SEPI. The instrument as a whole demonstrates reasonable internal consistency, as Cronbach's alpha is at a relatively acceptable level. The implications of the study refer to the possibility of using this questionnaire in experimental studies that aim to establish a baseline level of children's sun exposure or to identify a change between levels of children's sun exposure when measurements are taken at two different points in time. The latter may be useful when future studies aim to evaluate the effect of interventions to promote sun protective habits, as lower levels of reported sun exposure or higher levels of taking preventive measures against sun exposure or both would indicate the potential effectiveness of interventions addressed to children. Specifically, SEPI can be used to evaluate the effectiveness of preventive interventions with primary school-aged children if administered as a pre-test before students' participation in an intervention and as a post-test after an intervention is completed. When SEPI is used as a pre-test, items require the participants to think back

in time, recollect a pertinent action and provide an accurate response that represents their previous level of sun exposure and their past propensity to protect themselves from the sun. In our future work, we will conduct a technologically supported intervention using UV sensors with a duration of approximately 1–2 months. In this intervention, students are expected to learn about the harmful effects of UVR exposure and empirically test suggested protective measures. Students are expected to experiment through inquiry-based learning with different protective measures and conclude that such measures can be beneficial. When SEPI is used as a post-test upon completion of the intervention, items require the participants to think back in time, by focusing on the past few months after the pre-test, recollect a pertinent action, and provide an accurate response that represents their current level of sun exposure and their current propensity to protect themselves from the sun. Ideally, if the intervention is successful, we would expect students to indicate that they use protective measures more often (in Part 1 of SEPI) in the post-test and indicate their inclination or tendency to use protective measures that they have not considered using in the past (in Part 2 of SEPI) indicating an inclination for behavioral change. For example, if students “never thought of giving up sunbathing” in the pre-test but “intend to give up sunbathing” or “have recently given up sunbathing” in the post-test, that would be a desired behavioral change most likely caused by the intervention. However, we do recognize the limitation of some items not being applicable because students’ behavior cannot be expected to change from pre-test to post-test in relatively short-term interventions. An example of such an item is “How many times have you been sunburnt (redness and pain) during the last 12 months?” In such items, we expect students’ answers to remain unchanged. To counteract this limitation, a second instrument with satisfactory psychometric properties, the RASP-B questionnaire [34] (which is based on the transtheoretical model of behavioral change concerning UV radiation and protection), will also be administered, attempting to evaluate changes in students’ behavior from pre to post.

4.1. Limitations

We collected our survey data between May 26th and June 7th, when schools were approaching the end of the academic year and before children’s summer vacation. Some questions (e.g., Part 1, question 2) required children to report behavior from the past summer holiday period. The possibility of recall bias, which is caused by inaccurate or incomplete recollection of events by the respondents, must be considered. Recall bias is a particular concern for retrospective survey questions, and uncertainty and recall bias are inevitable elements in self-reported measures [18].

4.2. Future Work

As noted by Karlsson et al. (2020), an area of potential future instrument improvement in terms of validation would be to validate SEPI against an objective measure of UVR exposure. This could be measured with an individual UV meter that assesses the degree of actual UV exposure.

5. Conclusions

As noted by Deter et al. (2015), combining the two parts of SEPI allows researchers to examine not only the children’s present behavior but also the propensity to change it in the same instrument. This provides valuable insight and paints a more complete picture of whether students need to increase sun protection while simultaneously providing the possibility to successfully promote such a change.

In conclusion, our study showed the Greek translation of SEPI to be both valid and reliable. As such, it can be used as a measurement tool in research studies addressing sun exposure to evaluate the effect of interventions to promote sun protective habits.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/su15031870/s1>, The Sun Exposure and Protection Index (SEPI): English version and the Sun Exposure and Protection Index (SEPI): Greek version.

Author Contributions: Conceptualization, S.T. and I.N.; methodology, S.T. and I.N.; validation, S.T.; formal analysis, S.T.; resources, I.N.; data curation, S.T.; writing—original draft preparation, S.T.; writing—review and editing, I.N.; supervision, I.N.; project administration, S.T.; funding acquisition, I.N. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: The study was conducted according to the World Medical Association Declaration of Helsinki. The study followed American Psychological Association (APA) ethical standards and General Data Protection Regulation (EU) 2016/679 (GDPR) guidelines. Its protocol is in accordance with the guidelines provided by the University Ethics Committee, and it was approved the country's National Center for Educational Research and Evaluation (Reference number 175662 05/08/2022).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study, including their parents.

Data Availability Statement: Data supporting reported results can be provided by the authors upon request.

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Conflicts of Interest: The authors declare no conflict of interest.

References

1. IARC Research—IARC. Available online: <https://www.iarc.who.int/research-home/> (accessed on 2 December 2022).
2. Kyprianou, D.; Charalambidou, I.; Famojuo, O.; Wang, H.; Su, D.; Farazi, P.A. Knowledge and Attitudes of Cypriots on Melanoma Prevention: Is There a Public Health Concern? *BMC Public Health* **2022**, *22*, 53. [[CrossRef](#)] [[PubMed](#)]
3. Buller, D.B.; Borland, R. Skin Cancer Prevention for Children: A Critical Review. *Health Educ. Behav.* **1999**, *26*, 317–343. [[CrossRef](#)] [[PubMed](#)]
4. Daghan, S.; Ozeren, E. Sun Protection Behavior and Individual Risk Factors of Turkish Primary School Students Associated with Skin Cancer: A Questionnaire-Based Study. *Asian Pac. J. Cancer Prev. APJCP* **2011**, *12*, 765–770.
5. Teng, Y.; Yu, Y.; Li, S.; Huang, Y.; Xu, D.; Tao, X.; Fan, Y. Ultraviolet Radiation and Basal Cell Carcinoma: An Environmental Perspective. *Front. Public Health* **2021**, *9*, 666528. [[CrossRef](#)]
6. Sun, X.; Zhang, N.; Yin, C.; Zhu, B.; Li, X. Ultraviolet Radiation and Melanomagenesis: From Mechanism to Immunotherapy. *Front. Oncol.* **2020**, *10*, 951. [[CrossRef](#)]
7. Wright, C.; Reeder, A.I.; Gray, A.; Cox, B. Child Sun Protection: Sun-Related Attitudes Mediate the Association between Children's Knowledge and Behaviours. *J. Paediatr. Child Health* **2008**, *44*, 692–698. [[CrossRef](#)]
8. Rueter, K.; Jones, A.P.; Siafarikas, A.; Chivers, P.; Prescott, S.L.; Palmer, D.J. The Influence of Sunlight Exposure and Sun Protecting Behaviours on Allergic Outcomes in Early Childhood. *Int. J. Environ. Res. Public Health* **2021**, *18*, 5429. [[CrossRef](#)]
9. Balato, N.; Gaudiello, F.; Balato, A.; Monfrecola, G. Sun Habits in the Children of Southern Italy. *J. Am. Acad. Dermatol.* **2007**, *57*, 883–887. [[CrossRef](#)]
10. Cokkinides, V.E.; Johnston-Davis, K.; Weinstock, M.; O'Connell, M.C.; Kalsbeek, W.; Thun, M.J.; Wingo, P.A. Sun Exposure and Sun-Protection Behaviors and Attitudes among U.S. Youth, 11 to 18 Years of Age. *Prev. Med.* **2001**, *33*, 141–151. [[CrossRef](#)]
11. Gamage, N.; Nguyen, R.; Clare, I.M.; Lucas, R.M.; Strickland, M.; Granich, J.; Gorman, S. Sun-Health Behaviours and Attitudes towards Sun Safety amongst Australian Teenagers: A Qualitative Update. *BMC Res. Notes* **2021**, *14*, 349. [[CrossRef](#)]
12. Thoonen, K.; van Osch, L.; de Vries, H.; Jongen, S.; Schneider, F. Are Environmental Interventions Targeting Skin Cancer Prevention among Children and Adolescents Effective? A Systematic Review. *Int. J. Environ. Res. Public Health* **2020**, *17*, 529. [[CrossRef](#)]
13. Glanz, K.; Yaroch, A.L.; Dancel, M.; Saraiya, M.; Crane, L.A.; Buller, D.B.; Manne, S.; O'Riordan, D.L.; Heckman, C.J.; Hay, J.; et al. Measures of Sun Exposure and Sun Protection Practices for Behavioral and Epidemiologic Research. *Arch. Dermatol.* **2008**, *144*, 217–222. [[CrossRef](#)]

14. Horváth, Z.; Evelin, C.A.; Oláh, P.; Gyulai, R.; Lengyel, Z. Results of a Primary Skin-Cancer-Prevention Campaign in Early Childhood on Sun-Related Knowledge and Attitudes in Southern Hungary. *Cancers* **2021**, *13*, 3873. [[CrossRef](#)]
15. Aquilina, S.; Gauci, A.A.; Ellul, M.; Scerri, L. Sun Awareness in Maltese Secondary School Students. *J. Eur. Acad. Dermatol. Venereol.* **2004**, *18*, 670–675. [[CrossRef](#)]
16. Hart, K.M.; DeMarco, R.F. Primary Prevention of Skin Cancer in Children and Adolescents: A Review of the Literature. *J. Pediatr. Oncol. Nurs.* **2008**, *25*, 67–78. [[CrossRef](#)]
17. Theodosi, S.; Nicolaidou, I. Affecting Young Children’s Knowledge, Attitudes, and Behaviors for Ultraviolet Radiation Protection through the Internet of Things: A Quasi-Experimental Study. *Computers* **2021**, *10*, 137. [[CrossRef](#)]
18. Detert, H.; Hedlund, S.; Anderson, C.D.; Rodvall, Y.; Festin, K.; Whiteman, D.C.; Falk, M. Validation of Sun Exposure and Protection Index (SEPI) for Estimation of Sun Habits. *Cancer Epidemiol.* **2015**, *39*, 986–993. [[CrossRef](#)]
19. Widemar, K.; Falk, M. Sun Exposure and Protection Index (SEPI) and Self-Estimated Sun Sensitivity. *J. Prim. Prev.* **2018**, *39*, 437–451. [[CrossRef](#)]
20. Duarte, A.F.; Picoto, A.; Pereira, A.d.C.; Correia, O. Sun Protection in Children: A Behavioural Study. *Eur. J. Dermatol.* **2018**, *28*, 338–342. [[CrossRef](#)]
21. Geller, A.C.; Rutsch, L.; Kenausis, K.; Selzer, P.; Zhang, Z. Can an Hour or Two of Sun Protection Education Keep the Sunburn Away? Evaluation of the Environmental Protection Agency’s Sunwise School Program. *Environ. Health* **2003**, *2*, 13. [[CrossRef](#)]
22. Hewitt, M.; Denman, S.; Hayes, L.; Pearson, J.; Wallbanks, C. Evaluation of ‘Sun-Safe’: A Health Education Resource for Primary Schools. *Health Educ. Res.* **2001**, *16*, 623–633. [[CrossRef](#)] [[PubMed](#)]
23. Saridi, M.I.; Rekleiti, M.D.; Toska, A.G.; Souliotis, K. Assessing a Sun Protection Program Aimed at Greek Elementary School Students for Malign Melanoma Prevention. *Asian Pac. J. Cancer Prev.* **2014**, *15*, 5009–5018. [[CrossRef](#)] [[PubMed](#)]
24. Rouhani, P.; Parmet, Y.; Bessell, A.G.; Peay, T.; Weiss, A.; Kirsner, R.S. Knowledge, Attitudes, and Behaviors of Elementary School Students Regarding Sun Exposure and Skin Cancer. *Pediatr. Dermatol.* **2009**, *26*, 529–535. [[CrossRef](#)] [[PubMed](#)]
25. Theodosi, S.; Nicolaidou, I. *An E-Learning Environment For Influencing Children’s Attitudes toward Ultraviolet Protection*; Ktisis Cyprus University of Technology: Limassol, Cyprus, 2022.
26. Køster, B.; Søndergaard, J.; Nielsen, J.B.; Christensen, K.B.; Allen, M.; Olsen, A.; Bentzen, J. Knowledge Deficit, Attitude and Behavior Scales Association to Objective Measures of Sun Exposure and Sunburn in a Danish Population Based Sample. *PLoS ONE* **2017**, *12*, e0178190. [[CrossRef](#)]
27. Kubar, W.L.; Rodrigue, J.R.; Hoffmann, R.G. Children and Exposure to the Sun: Relationships among Attitudes, Knowledge, Intentions, and Behavior. *Psychol. Rep.* **1995**, *77* (Suppl. S3), 1136–1138. [[CrossRef](#)]
28. Saridi, M.; Toska, A.; Rekleiti, M.; Wozniak, G.; Liachopoulou, A.; Kalokairinou, A.; Souliotis, K.; Birbas, K. Sun-Protection Habits of Primary Students in a Coastal Area of Greece. *J. Skin Cancer* **2012**, *2012*, 629652. [[CrossRef](#)]
29. Karlsson, E.; Hübner, I.-M.; Haluza, D.; Falk, M. Validation of SEPI in German—A German Translation of the Sun Exposure and Protection Index. *Int. J. Environ. Res. Public Health* **2020**, *17*, 6172. [[CrossRef](#)]
30. Schrepp, M. On the Usage of Cronbach’s Alpha to Measure Reliability of UX Scales. *JUX* **2020**, *15*, 12.
31. Taber, K.S. The Use of Cronbach’s Alpha When Developing and Reporting Research Instruments in Science Education. *Res. Sci. Educ.* **2018**, *48*, 1273–1296. [[CrossRef](#)]
32. Schmitt, N. Uses and Abuses of Coefficient Alpha. *Psychol. Assess.* **1997**, *8*, 350. [[CrossRef](#)]
33. Herodotou, C.; Kyza, E.A.; Nicolaidou, I.; Hadjichambis, A.; Kafouris, D.; Terzian, F. The Development and Validation of the GMOAS, an Instrument Measuring Secondary School Students’ Attitudes Towards Genetically Modified Organisms. *Int. J. Sci. Educ. Part B* **2012**, *2*, 131–147. [[CrossRef](#)]
34. Borschmann, R.D.; Cottrell, D. Developing the Readiness to Alter Sun-Protective Behaviour Questionnaire (RASP-B). *Cancer Epidemiol.* **2009**, *33*, 451–462. [[CrossRef](#)]

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