Original Article

A Cross-sectional Study of the Knowledge, Attitudes, and Practices on Sun Exposure and Protection between College Track and Field Athletes from the Urban and Rural Settings in the Philippines

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Abstract

Background: Skin cancer incidence has risen in recent decades, with excessive ultraviolet radiation exposure being a significant factor, especially among athletes involved in outdoor sports. This study examines differences in knowledge, attitudes, and practices (KAP) regarding sun exposure and protection between urban and rural college track and field athletes.

Subjects and Methods: This cross-sectional study was conducted in the Philippines with 60 college track and field athletes selected through nonprobability convenience sampling. A questionnaire, adapted from two local studies, assessed KAP regarding sun exposure. The final questionnaire was then distributed via Google Forms. Pearson's correlation assessed the relationships between KAP.

Results: Urban and rural athletes lacked adequate knowledge about sun exposure and protection, though urban athletes had a slightly higher knowledge score. Urban athletes exhibited more desirable attitudes toward sun protection. Both the groups showed inadequate sun protection practices. Social media was the most common source of information.

Conclusions: This study found that while locality does not determine sun protection practices, urban athletes showed more positive attitudes. Greater knowledge was linked to better attitudes but did not always translate into improved practices. Addressing barriers that hinder the application of sun protection knowledge is essential to bridging this gap and promoting consistent sun safety behaviors, especially among athletes who engage in outdoor sports.

Keywords: Attitude, knowledge, practice, sun exposure, sun protection, track and field athletes

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Introduction

Ultraviolet (UV) radiation is a risk factor for skin diseases, including actinic keratoses and skin cancers, among outdoor athletes with prolonged sun exposure.[1-3] Marathon runners, a Track and Field event, exceed the UV rays dose exposure recommended limits by the International Commission on Non-Ionizing Radiation Protection.[2,3] Sun protection remains inadequate due to limited knowledge, sport-related constraints, and restricted sunscreen access.[2,4-7] Few have explored differences in sun exposure knowledge, attitudes, and practices (KAP) between urban and rural athletes.[8-10] This study aims to assess differences in KAP on sun exposure and protection between urban and rural college track and field athletes.

Subjects and Methods

The conduct of this research was in accordance with the ethical principles of the Helsinki Declaration of 1975, as revised in 2013, and the approval of the Institutional Review Board of the University of Santo Tomas Faculty of Medicine and Surgery, España, Manila. In compliance with the Data Privacy Act of 2012 and its implementing rules and regulations in 2016, only the authors will have access to any data obtained in this study. In the event of any publication, all information will be kept confidential.

This analytical cross-sectional study was conducted to assess the differences in KAP regarding sun protection among Filipino college athletes. The study also examined the correlation between their knowledge and attitudes on sun exposure and protection with their sun-protective practices. Data were collected using a self-administered questionnaire, measuring outcomes simultaneously.

The study included Filipino college track and field athletes from urban and rural areas, classified according to the Philippine Statistics Authority's Urban-Rural Classification. Participants included student–athletes aged 18–26, actively training for track and field events, and who had resided at their training location for at least 1 year. Exclusion criteria included student–athletes who primarily trained indoors due to limited sun exposure, as well as those with diagnosed photosensitivity or other medical conditions that necessitated strict sun avoidance, which could interfere with the analysis of sun exposure practices.

A nonprobability convenience sampling method was used to select athletes from urban and rural settings, defined by the national urbanization level of 54%. The sample size was calculated using *Sampsize* – an online sample size calculator. The researchers set Proportion 1 at 55% adequacy of knowledge in the urban setting based on a local study entitled KAP concerning sun exposure and sun protection among adult triathletes in Metro Manila, Cebu, and Davao City, Philippines: A cross-sectional study. Proportion 2 was set at 20%, estimated for the rural setting. The study had a power of 80%, with a ratio of 1:1 for urban and rural respondents, and an alpha risk of 5%. The calculated sample size of 58 was adjusted to 60 respondents, divided equally between 30 urban and 30 rural participants to account for potential dropouts or incomplete surveys.

To minimize selection bias, the researchers explicitly defined the inclusion and exclusion criteria and only included participants in the study that satisfied the aforementioned eligibility. Dropout rates were noted to be at 0%, but should any participant opt to drop out during the study, the sample size was statistically adjusted prior to data collection to minimize potential attrition bias.

The study aimed to evaluate the KAP of athletes regarding sun exposure and protection, with these being the dependent variables of the research. Knowledge referred to the athletes' awareness of sun exposure risks, attitude reflected their perceptions and behaviors toward it, and practice was related to their actual behaviors concerning sun protection. The independent variables included both urban and rural settings and the sociodemographic characteristics of the population. Rural setting pertains to a university located in a municipality with an urbanization level below 54%, inversely urban setting refers to a university located in a municipality with an urbanization level equal or above 54%. Sociodemographic characteristics included age, sex, income, year level, track experience, skin cancer history, Fitzpatrick skin type, and sources of information.

The study utilized a questionnaire, adapted from two local studies assessing KAP regarding sun exposure and protection. After obtaining approval from the original authors, minimal modifications were made, including adding a reference picture of Fitzpatrick skin types and updating terms like "SPF" to "sun protection factor".

The questionnaire was pilot-tested with 30 athletes (15 urban and 15 rural), followed by validation from two board-certified dermatologists. Upon finalization, the questionnaire was distributed via Google Forms after obtaining ethics approval from the university. The head coaches of the track and field teams were contacted for approval, and willing athletes were recruited and provided with a consent form.

The link to the survey was shared through social media, allowing athletes to respond anonymously and with flexibility. To ensure that the participants personally accomplished the survey, the objectives and details of the study were thoroughly explained to each participant prior to data collection. Informed participation was obtained, and upon completion of the Google Form, participants were requested to submit a screenshot of their responses as proof of completion. This verification process was implemented to maintain the authenticity of responses and uphold the integrity of the data collected. The data collected through Google Forms were compiled in Google Sheets for analysis. Data were then analyzed using descriptive statistics and inferential statistics to evaluate relationships between KAP.

Knowledge was categorized as adequate or inadequate based on a 17-item true/false section, with a score of 15 or higher indicating adequate knowledge. Attitude was classified as desirable or undesirable based on a 3-point scale, with a desirable attitude corresponding to a score above 20 out of 30. Practice was evaluated by participants' engagement in at least five sun-protective behaviors, such as limiting sun exposure, wearing protective accessories, applying sunscreen (SPF 30+), and reapplying every 4 h. Sunscreen practice was further examined for nontraining and training/competition days, focusing on frequency, reapplication, areas covered, and SPF ratings. A sociodemographic profile was also collected, including age, sex, college year, years in track and field, family income, Fitzpatrick skin type, skin cancer history, and information sources.

Descriptive statistics, including frequency (*n*) and proportion (%), were used to describe sociodemographic variables, which included age, sex, college year level, years in track and field, monthly family income, Fitzpatrick skin type, history of skin cancer, and sources of knowledge on sun exposure and protection. In addition, frequency and proportion were also used to describe the number of each answer per item in the questionnaire, which is divided into KAP for both urban and rural. The mean and standard deviation (SD) were calculated specifically for age. Inferential statistics were also used, employing Pearson's correlation to assess the association (*r* value) of knowledge to attitude, knowledge to practice, and attitude to practice.

The entire study spanned from August 2021 to April 2025. It began with protocol development from August 2021 to May 2022. The Institutional Review Board process was conducted from June to December 2022, followed by pilot testing from February to September 2023. Data collection took place from April to September 2024, with data analysis and the writing of results and discussions occurring from September 2024 to February 2025. Editing and final revisions were completed by March 2025, with submission in April 2025.

Results

A total of 89 college track and field athletes were initially considered for the study; however, 29 were excluded for failing to meet the inclusion criteria, leaving 60 participants (30 from rural and 30 from urban settings). The mean age was 21 years (SD = 2.06; urban = 2.12, and rural = 2.03). The majority of participants were male in both the groups (rural = 20 [67%]; urban = 20 [67%]). Most rural participants were second-year (*n* = 9 [30%]) and third-year (*n* = 9 [30%]) students, while third-year students (*n* = 10 [33%]) were most common in the urban group. In terms of Track and Field experience, most participants had one to 2 years of practice (rural = 11 [36%]; urban = 10 [33%]). The majority reported a monthly family income below Php 8,000 in both rural (*n* = 14 [47%]) and urban (*n* = 13 [43%]) settings. Only one respondent had a known history of skin cancer. Regarding Fitzpatrick skin type, type IV (olive complexion) was most common in the rural group (*n* = 10 [33%]), while type III (medium complexion) was most prevalent in the urban group (*n* = 14 [47%]). Social media was the primary source of information on sun exposure and protection for both rural (*n* = 26 [87%]) and urban (*n* = 27 [90%]) participants, followed by school (rural = 23 [77%]; urban = 15 [50%]) [Supplementary Tables 1-3].

Rural and urban athletes showed strong awareness of UV ray effects. An equal proportion (90%) recognized that UV rays cause tanning, sunburn, skin aging, and skin spots, and pose fatal risks such as skin cancer. In addition, 93% of respondents acknowledged the protective role of sunscreen. However, notable gaps in knowledge were observed between the groups. Urban athletes were significantly more aware of the heightened risk of skin cancer in fair-skinned individuals, with 70% identifying this risk compared to only 50% of rural respondents, highlighting a notable gap in understanding that may influence sun protection behaviors. Similarly, 77% of urban respondents disagreed with the statement that sunscreen is unnecessary for darker skin compared to only 60% of rural respondents who also considered the statement false. Rural athletes demonstrated a higher prevalence of misconceptions regarding sun exposure. For instance, only 47% of rural respondents believed tanned skin is unhealthy, compared to 53% of urban athletes. Similarly, only 53% of rural athletes disagreed that sun is harmful only when

you get sunburn, compared to 60% of urban respondents. Urban athletes also exhibited slightly greater awareness about the need for sun protection on cloudy days, with 63% acknowledging its importance compared to 57% of their rural counterparts [Supplementary Table 4].

Differences in attitudes toward sun exposure and protection were also evident. Urban athletes expressed greater concern about its harmful effects, with 53% worried about skin aging compared to 43% of rural respondents. Similarly, 60% of urban athletes feared developing skin cancer from UV rays, while only 43% of rural athletes shared this concern. Urban respondents were also more likely to believe sunscreen use during outdoor activities is worth the effort (64% vs. 47%). However, misconceptions about sunscreen were common in both the groups, with only 47% of respondents rejecting the idea that sunscreen is only for women. Perceptions of tanned skin varied, with 43% of rural athletes associating it with attractiveness and health compared to 33% of urban respondents, who were more neutral. In addition, 40% of rural respondents believed sunbathing is healthy, compared to just 17% of urban athletes. Rural athletes were also more likely to perceive sunscreen as greasy and impractical, while urban respondents were more neutral or disagreed with these concerns [Supplementary Table 5].

In terms of sun exposure and protection practices, differences were also evident between rural and urban athletes. Rural respondents were more likely to train before 10 AM (53% vs. 50%) and for longer durations, with 13% training for more than 3 h compared to 10% of urban athletes. However, urban athletes trained more frequently, with 63% training 16–30 days per month, slightly higher than the 60% of rural respondents. Despite these variations, rural athletes reported a higher incidence of sunburn (90%) compared to their urban counterparts (73%), suggesting potential differences in sun protection measures or environmental exposure [Supplementary Table 6].

Both the groups demonstrated similar sun protection habits, with 70% of respondents using sunglasses. The use of caps or visors was also comparable (60% rural, 63% urban). However, sunscreen use was more prevalent among urban athletes (80%) compared to rural respondents (70%). Conversely, more rural athletes preferred wearing long-sleeved clothing (83% vs. 73%). Urban athletes were slightly more likely to avoid outdoor activities during peak sun hours (47% vs. 43%) and to seek shade (47% vs. 37%). Notably, 7% of rural athletes reported using no sun protection at all, compared to only 3% of urban athletes, though both figures remained relatively low [Table 1].

Table 1: Methods of sun protection

	Rural, *n* (%)	Urban, *n* (%)
	Frequency (proportion (f/*n** 100) %)	
Sunglasses	21 (70)	21 (70)
Cap/visor	18 (60)	19 (63)
Sunscreen	21 (70)	24 (80)
Long-sleeved clothes	25 (83)	22 (73)
Avoids going out from 10 am to 4 pm	13 (43)	14 (47)
Stays in shade	11 (37)	14 (47)
None	2 (7)	1 (3)

Urban athletes exhibited more consistent sunscreen use, with 50% applying it daily during training compared to 37% of rural athletes. In addition, 20% of urban athletes reapplied sunscreen every 4 h, compared to 13% of rural respondents. Despite these practices, 43% of both the groups did not use sunscreen on training days, and even more avoided it on nontraining days (47% rural, 40% urban). Urban athletes were slightly more likely to apply sunscreen to their face and neck (57% vs. 47%). Both the groups preferred sunscreens with SPF 30 or higher, but more urban athletes use sunscreens with >30 SPF during nontraining days (17% vs. 10%) [Tables 2 and 3].

The differences in KAP were compared between urban and rural populations, involving 30 athletes from each group. Knowledge scores were inadequate in both urban and rural groups, with no significant difference (urban mean = 12.8, rural mean = 11.93, $P = 0.215$). However, urban athletes had a significantly more desirable attitude (mean = 21.37) compared to rural athletes (mean = 19.57) ($P = 0.049$). Sun protection practices were similarly inadequate in both the groups, with no significant difference (urban mean = 2.7, rural mean = 2.57, $P = 0.676$). A subanalysis was done to assess the attitude portion of the questionnaire since there was a significant difference in the responses between rural and urban groups. There was no difference in the responses between the two groups for question one to nine ($P > 0.05$). However, a significant difference was observed in question 10 ($P = 0.003$), with more individuals from the urban area disagreeing with the statement that "Sunscreen is greasy that makes my face oily" [Tables 4 and 5].

The KAP correlation regarding sun exposure and protection between the two groups was compared using *r* value, wherein *r* greater than zero indicates a positive correlation, *r* less than zero indicates a negative correlation, and r equal to zero indicates no correlation. Knowledge and attitude scores showed a positive correlation for urban athletes ($r = 0.58$) and rural athletes ($r = 0.57$). Attitude and practice scores showed a positive correlation for urban ($r = 0.61$) and rural ($r = 0.59$) groups. Similarly, there was a positive correlation between the knowledge

Table 2: Sunscreen use during ordinary/nontraining days: Frequency of use and reapplication (frequency, %)

Variables	Training			Nontraining		
	Frequency (proportion (f/*n**100) %)					
	General, *n* (%)	Urban, *n* (%)	Rural, *n* (%)	General, *n* (%)	Urban, *n* (%)	Rural, *n* (%)
Frequency of use						
Daily	26 (43)	15 (50)	11 (37)	21 (35)	12 (40)	9 (30)
>3/week	1 (2)	0	1 (3)	7 (12)	3 (10)	4 (13)
1–2×/week	5 (8)	3 (10)	2 (7)	5 (8)	1 (3)	4 (13)
1–3×/month	2 (3)	0	2 (7)	1 (2)	0	1 (3)
Do not use	26 (43)	12 (40)	14 (47)	26 (43)	14 (47)	12 (40)
Reapplication						
Every 4 h	10 (17)	6 (20)	4 (13)	6 (10)	3 (10)	3 (10)
Every 2 h	3 (5)	1 (3)	2 (7)	2 (3)	0	2 (7)
At least once a day	16 (27)	7 (23)	9 (30)	20 (33)	9 (30)	11 (37)
No reapplication	3 (5)	3 (10)	0	3 (5)	2 (7)	1 (3)
Not applicable	28 (47)	13 (13)	15 (50)	29 (48)	16 (53)	13 (43)

Table 3: Sunscreen use during ordinary/nontraining days: Body areas and sun protection Factor (frequency, %)

Variables	Training			Nontraining		
	Frequency (proportion (f/*n**100) %)					
	General, *n* (%)	Urban, *n* (%)	Rural, *n* (%)	General, *n* (%)	Urban, *n* (%)	Rural, *n* (%)
Body areas						
Face	31 (52)	17 (57)	14 (47)	31 (52)	15 (50)	16 (53)
Neck	26 (43)	14 (47)	12 (40)	23 (38)	12 (40)	11 (37)
Arms and hands	20 (33)	12 (40)	8 (27)	17 (28)	9 (30)	8 (27)
Shoulders and back	18 (30)	10 (33)	8 (27)	18 (30)	9 (30)	9 (30)
Legs and feet	18 (30)	11 (37)	7 (23)	16 (27)	9 (30)	7 (23)
Trunk and chest	7 (12)	6 (20)	1 (3)	8 (13)	6 (30)	2 (7)
Not applicable	27 (45)	12 (40)	15 (50)	27 (45)	14 (47)	13 (43)
SPF						
<15	9 (15)	6 (20)	3 (10)	10 (17)	5 (17)	5 (17)
15–29	6 (10)	3 (10)	3 (10)	7 (12)	4 (14)	3 (10)
30	9 (15)	4 (13)	5 (17)	5 (8)	1 (3)	4 (13)
>30	8 (13)	4 (13)	4 (13)	8 (13)	5 (17)	3 (10)
Not applicable	28 (47)	13 (43)	15 (50)	30 (50)	15 (50)	15 (50)

SPF: Sun protection factor

Table 4: Knowledge, attitudes, and practices difference between urban and rural

	n	Adequate/ desirable score (%)	Inadequate/ undesirable score (%)	Mean score	Interpretation	Mean difference (SD)	*P*
Knowledge							
Urban	30	9/30 (30)	21/30 (70)	12.8	Inadequate	0.87 (2.67–2.69)	0.215
Rural	30	6/30 (20)	24/30 (80)	11.93	Inadequate		
Attitude							
Urban	30	17/30 (56.67)	13/30 (43.33)	21.37	Desirable	1.80 (3.60–3.34)	0.049*
Rural	30	10/30 (33.33)	20/30 (66.67)	19.57	Undesirable		
Practice							
Urban	30	2/30 (6.67)	28/30 (93.33)	2.7	Inadequate	0.13 (1.18–1.28)	0.676
Rural	30	3/30 (10)	27/30 (90)	2.57	Inadequate		

*$P<0.05$, there is a significant difference between the sun protection attitudes between two groups. Score of ≥15 under knowledge means adequate, Score of >20 under attitude means desirable, Score of ≥5 means having adequate practice. SD: Standard deviation

and practice scores for both urban (r = 0.51) and rural groups (r = 0.50) [Table 6].

Discussion

The relatively young age of participants (mean = 21) indicates a heightened risk of cumulative sun damage, consistent with Alghamdi *et al*., who reported increased sunburn incidence in younger individuals.[9] The predominance of male respondents may have influenced KAP scores, as men generally report greater sun exposure and lower sunscreen use.[6] Socioeconomic status was also observed as a contributing factor, with most respondents earning below Php 8,000 monthly. As Cunningham *et al*. highlighted, lower-income groups are less likely to adopt sunscreen use, although Guevara *et al*. found that higher-income athletes may also exhibit inadequate sun protection practices due to prioritizing sports gear over sunscreen.[7,11] Skin type was identified as a potential factor,

Table 5: Attitude difference between urban and rural

	Rural, mean (SD)	Urban, mean (SD)	*P*
My skin will age more quickly if I spend more time under the sun	2.3 (0.70)	2.45 (0.62)	0.36
I am concerned that UV rays exposure will give me skin cancer	2.23 (0.77)	2.47 (0.73)	0.235
It's worth taking the trouble of using sunscreen during trainings/competitions	2.37 (0.67)	2.6 (0.56)	0.149
Sunscreen is like a make-up and leaves a white cast-residue	1.7 (0.70)	1.93 (0.69)	0.2
Sunscreen is for the ladies only	2.23 (0.82)	2.23 (0.82)	1
A sun-tanned skin makes me look more attractive	1.73 (0.74)	1.77 (0.63)	0.851
A sun-tanned skin makes me look healthier	1.8 (0.76)	1.8 (0.66)	1
Sunbathing is healthy for my body	1.73 (0.69)	2 (0.59)	0.113
Sunscreen is expensive and impractical	1.9 (0.76)	2.07 (0.78)	0.407
Sunscreen is greasy that makes my face oily	1.57 (0.57)	2.03 (0.61)	0.003

UV: Ultraviolet, SD: Standard deviation

Table 6: Knowledge, attitudes, and practices correlation of sun exposure and protection (*r* value) between urban and rural

	Urban	Rural
Knowledge and attitude score	0.59	0.57
Knowledge and practice scores	0.51	0.50
Attitude and practice scores	0.61	0.59

$r>0$ means positive correlation, $r<0$ means negative correlation, $r=0$ means no correlation

with individuals having Fitzpatrick III skin types facing higher UV-related risks. While Fitzpatrick IV skin types experience lower skin cancer incidence, they are often diagnosed at more advanced stages, reinforcing the need for universal sun protection practices regardless of skin type.

This study found no significant difference in knowledge between urban and rural athletes ($P = 0.215$), aligning with Alghamdi *et al*.'s findings in Saudi Arabia.[9] However, Ecuadorian data indicated higher knowledge levels in urban populations, emphasizing regional disparities in educational access and public health efforts. While urban athletes demonstrated significantly more favorable attitudes toward sun protection ($P = 0.049$), both the groups exhibited inadequate sun protection practices ($P = 0.676$). These results are consistent with Guevara *et al*. and Duarte *et al*., who reported inadequate sun protection behaviors among athletes despite differing geographical contexts.[7,12] The absence of significant differences in knowledge levels contradicts some international findings, raising questions about regional differences in educational campaigns or access to information. While the study design effectively captures KAP variations across demographics, further investigation into cultural influences and social norms may provide additional insights. Future research may explore targeted educational campaigns that address these disparities more effectively.

A moderate positive correlation between knowledge and attitudes was identified, suggesting that improved education can foster positive attitudes, yet may not directly influence improved sun protection practices. As Glanz *et al*. reported, habitual behaviors, social norms, and perceived inconvenience significantly influence sun protection practices. The moderate correlation between attitudes and practices underscores the need for strategies that address behavior reinforcement in addition to knowledge improvement.[10] Although the study effectively demonstrated these correlations, the reliance on self-reported data may have introduced response bias. Future studies may benefit from incorporating objective measures such as observed sunscreen use or UV exposure monitoring to strengthen the reliability of findings.

Social media is the primary source of sun protection information among Filipino athletes, underscoring a shift in health information-seeking behaviors.[7] This finding suggests that leveraging digital platforms may improve public health education on sun safety. Meanwhile, schools were identified as key sources of information in rural areas, emphasizing the importance of integrating sun protection education into school curricula to reach underserved populations. The use of social media as a dominant information source highlights the potential for tailored digital campaigns targeting young athletes. However, future research should examine the quality and accuracy of sun protection content on social media platforms to mitigate misinformation risks. Further investigation into integrating digital campaigns with traditional educational strategies may optimize sun safety awareness and behavior change.

Conclusions

This study shows that social media is the most common source of information about sun exposure and protection for urban and rural athletes. The locality (urban or rural) of Filipino athletes does not determine sun exposure and protection practices. However, locality may play a crucial role in the attitudes toward sun protection as most urban athletes showed desirable attitudes. Factors that may be attributed to urban locality are better access to sun protection education, more exposure to public health campaigns, and the greater availability of sun protection

products in urban areas. Increasing knowledge regarding sun exposure and protection is associated with a more positive attitude, but it does not necessarily lead to better sun protection practices. While urban athletes showed higher knowledge and exhibited more desirable attitudes than rural athletes, this does not translate into significantly better practices. While greater knowledge about sun protection is linked to better practices, it does not always lead to consistent behavior. Identifying the barriers that prevent individuals from applying their knowledge is essential for bridging this gap. There remains a gap in translating knowledge into practice, which should be explored to gain a deeper understanding of the potential barriers.

Future research should develop targeted interventions to bridge the gap between sun protection knowledge and actual practices among athletes. While urban athletes showed slightly better knowledge and more positive attitudes, both urban and rural groups had poor sun safety behaviors. Identifying barriers that hinder the application of knowledge is essential, especially in outdoor sports. With social media as the main information source, it should be used strategically to deliver sun safety education. Collaborations with educational institutions, sports organizations, and public health agencies should be considered to develop tailored digital campaigns that deliver credible, culturally relevant sun safety content to young athletes.

To improve generalizability, future studies should include larger, more diverse samples across various sports, age groups, and regions. Using longitudinal designs with standardized, objective tools will help track behavioral changes over time. Exploring cultural, regional, and socioeconomic factors will also support more tailored interventions. These findings can guide policy and training programs that promote consistent sun protection, protecting athletes' long-term health and performance. By revealing the poor sun protection habits of college track and field athletes despite adequate knowledge, it offers concrete data to guide schools, coaches, and sports organizations in creating targeted interventions. Future athletes can benefit through practical measures such as mandatory sunscreen use, distribution of protective gear, and coach-led reminders during training. These actions can help prevent sunburn, skin damage, and long-term risks like skin cancer, ultimately supporting both the health and performance longevity of Filipino student–athletes.

Data availability

Data supporting the results of the study can be found in this link: http://tinyurl.com/kapsunexposureandprotection.

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Conflicts of interest

There are no conflicts of interest.

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Supplementary Table 1: Sociodemographic profile: Age, sex, year level, and years of practice of college track and field athletes

Age	*n* (%)	Mean (SD)	
Overall	60 (100)	21.3 (2.06)	
Urban	30 (50)	21.1 (2.12)	
Rural	30 (50)	21.5 (2.03)	
Sociodemographic profile	**General (*n*=60), *n* (%)**	**Rural (*n*=30), *n* (%)**	**Urban (*n*=30)**
	Frequency (proportion (f/*n 100)%)**		
Sex (assigned at birth)			
Male	40 (67)	20 (67)	20 (67)
Female	20 (33)	10 (33)	10 (33)
College year level			
1st	9 (15)	5 (17)	4 (13)
2nd	15 (25)	9 (30)	6 (20)
3rd	19 (32)	9 (30)	10 (33)
4th	14 (23)	6 (20)	8 (27)
5th	3 (5)	1 (3)	2 (7)
6th	0	0	0
Number of years in track and field			
6 months–1 year	9 (15)	5 (17)	4 (13)
>1 year–2 years	21 (35)	11 (36)	10 (33)
>2 years–4 years	10 (17)	5 (17)	5 (17)
>4 years–6 years	5 (8)	5 (17)	0
>6 years–8 years	5 (8)	0	5 (17)
>8 years	10 (17)	4 (13)	6 (20)

SD: Standard deviation

Supplementary Table 2: Socio-Demographic Profile: Monthly Income and History of Skin Cancer of College Track and Field Athletes

Socio- demographic Profile	Frequency (Proportion (*f*/*n** 100)%)		
	General (*n*=60)	Rural (*n*=30)	Urban (*n*=30)
Monthly Family Income			
Php <8,000	27 (45%)	14 (47%)	13 (43%)
Php 8,001-15,000	13 (22%)	8 (27%)	5 (17%)
Php 15,001-30,000	11 (18%)	4 (13%)	7 (23%)
Php 30,001-50,000	5 (8%)	2 (7%)	3 (10%)
Php 50,001-100,000	1 (2%)	1 (3%)	0 (0%)
>Php 100,000	3 (5%)	1 (3%)	2 (7%)
History of Skin Cancer			
Yes	1 (2%)	0 (0%)	1 (3%)
No	59 (98%)	30 (100%)	29 (97%)

Supplementary Table 3: Socio-Demographic Profile: Fitzpatrick Skin Type & Source of Information of College Track and Field Athletes

Socio- demographic Profile	Frequency (Proportion (*f*/*n** 100)%)		
	General (*n*=60)	Rural (*n*=30)	Urban (*n*=30)
Fitzpatrick skin type			
I (Very Fair)	1 (2%)	0 (0%)	1 (3%)
II (Fair)	8 (13%)	6 (20%)	2 (7%)
III (Medium)	23 (38%)	9 (30%)	14 (47%)
IV (Olive)	18 (30%)	10 (33%)	8 (26%)
V (Brown)	10 (17%)	5 (17%)	5 (17%)
VI (Dark Brown)	0 (0%)	0 (0%)	0 (0%)
Source of Information			
Social Media	53 (88%)	27 (90%)	26 (87%)
T.V.	25 (42%)	11 (37%)	14 (47%)
Newspaper and Magazine	13 (22%)	6 (20%)	7 (23%)
Relatives and Friends	20 (33%)	9 (30%)	11 (37%)
School	38 (63%)	23 (77%)	15 (50%)
Others	1 (2%)	1 (3%)	0 (0%)
None	0 (0%)	0 (0%)	0 (0%)

Supplementary Table 4: Knowledge on sun exposure and protection of rural and urban

	Rural, *n* (%)	Urban, *n* (%)
	Frequency (proportion (f/*n** 100) %)	
UV rays cause tanning of skin	25 (83)	28 (93)
UV rays from sun exposure can cause sunburn	26 (87)	25 (83)
Too much sun exposure during outdoor training can cause skin aging	24 (80)	23 (77)
Outdoor training at 6 am–8 am does less skin damage than outdoor training at 10 am–4 pm	24 (80)	28 (93)
Sun exposure causes spots in the skin	23 (77)	24 (80)
Sun exposure causes skin cancer	19 (63)	23 (77)
Skin cancer can be fatal	27 (90)	27 (90)
The incidence of skin cancer is higher in fair-skinned than dark-skinned individuals	15 (50)	21 (70)
The sun is harmful only when you get sunburn	16 (53)	18 (60)
A sun-tanned skin is a sign of being healthy	14 (47)	16 (53)
Outdoor training during 10 am to 4 pm is most harmful to your skin	28 (93)	24 (80)
There is no need of sun protection on a cloudy day	18 (60)	19 (63)
Use of sunscreen can protect you from UV rays	28 (93)	28 (93)
One time application of sunscreen protects your skin for entire day	14 (47)	14 (47)
Use of high SPF sunscreen with proper reapplication can protect your skin from UV rays	26 (87)	27 (90)
Avoiding sunburn before 18 years old reduces risk of skin cancer	15 (50)	16 (53)
Sunscreen is not needed if one's skin is darker	18 (60)	23 (77)

UV: Ultraviolet, SPF: Sun protection factor

Supplementary Table 5: Attitudes on sun exposure and protection

	Rural			Urban		
	Frequency (proportion (f/*n** 100) %)					
	Agree, *n* (%)	Neutral, *n* (%)	Disagree, *n* (%)	Agree, *n* (%)	Neutral, *n* (%)	Disagree, *n* (%)
My skin will age more quickly if I spend more time under the sun	13 (43)	13 (43)	4 (14)	16 (53)	12 (40)	2 (7)
I am concerned that UV rays exposure will give me skin cancer	13 (43)	11 (37)	6 (20)	18 (60)	8 (27)	4 (13)
It's worth taking the trouble of using sunscreen during trainings/competitions	14 (47)	13 (43)	3 (10)	19 (64)	10 (33)	1 (3)
Sunscreen is like a make-up and leaves a white case-residue	13 (43)	13 (43)	4 (14)	8 (27)	16 (53)	6 (20)
Sunscreen is for the ladies only	7 (23)	9 (30)	14 (47)	7 (23)	9 (30)	14 (47)
A sun-tanned skin makes me look more attractive	13 (43)	12 (40)	5 (17)	10 (33)	17 (57)	3 (10)
A sun-tanned skin makes me look healthier	12 (40)	12 (40)	6 (20)	10 (33)	16 (54)	4 (13)
Sunbathing is healthy for my body	12 (40)	14 (47)	4 (13)	5 (17)	20 (66)	5 (17)
Sunscreen is expensive and impractical	10 (33)	13 (43)	7 (24)	8 (27)	12 (40)	10 (33)
Sunscreen is greasy that makes my face oily	14 (47)	15 (50)	1 (3)	5 (17)	19 (63)	6 (20)

UV: Ultraviolet

Supplementary Table 6: Practices on sun exposure and protection

	Rural			Urban		
	Frequency (proportion (f/*n** 100) %)					
	Before 10 am, *n* (%)	10 am–4 pm, *n* (%)	After 4 pm, *n* (%)	Before 10 am, *n* (%)	10 am–4 pm, *n* (%)	After 4 pm, *n* (%)
Time for outdoor training/competing	16 (53) <1 h	5 (17) 1 h–3 h	9 (30) More than 3 h	15 (50) <1 h	3 (10) 1 h–3 h	12 (40) More than 3 h
Daily training	4 (13) 1–5 days per month	22 (74) 6–15 per month	4 (13) 16–30 days per month	5 (17) 1–5 days per month	22 (73) 6–15 per month	3 (10) 16–30 days per month
Frequency of training/competing	3 (10)	9 (30)	18 (60)	7 (24)	4 (13)	19 (63)
	Rural		Urban			
	Yes, *n* (%)	No, *n* (%)	Yes, *n* (%)	No, *n* (%)		
Experienced sunburn	27 (90)	3 (10)	22 (73)	8 (27)		