

Knowledge, Attitudes, and Practices of Adults Toward Skincare and Sun Protection in Otukpo, North-Central Nigeria

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ARTICLE INFO

Keywords:

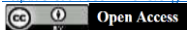
ultraviolet radiation, sun protection, skincare, knowledge, attitudes, practices, Nigeria.

Vol. 01, No. 05, 2026

<https://doi.org/10.5281/zenodo.23496928>

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ABSTRACT

Ultraviolet radiation can cause sunburn, premature skin aging, eye damage, and skin cancer. Preventive behaviors may remain uncommon even when people recognize the risks.

To assess knowledge, attitudes, and practices related to skincare and sun protection among adults in Otukpo Local Government Area, Benue State, Nigeria, and identify factors associated with poor practice.

A cross-sectional survey was conducted from June to September 2025 among 184 adults aged 18–65 years who had lived in Otukpo for at least one year. Participants were recruited by convenience sampling using a KoboToolbox questionnaire, with interviewer-assisted completion also used. Data were analyzed in SPSS version 27 using descriptive statistics, chi-square tests, and binary logistic regression; adjusted odds ratios (AORs) with 95% confidence intervals (CIs) are reported.

Of 184 respondents, 112 (60.9%) were classified as having good knowledge and 158 (85.9%) considered sun protection important. Daily sunscreen use was reported by 42 (22.8%); 28 (15.2%) reported avoiding sun exposure between 12:00 and 15:00, and 42 (22.8%) reported using protective clothing, wide-brimmed hats, or umbrellas. Overall, 126 (68.5%) had poor practice. Independent associations with poor practice included male sex (AOR 2.14, 95% CI 1.18–3.87; $p=0.012$), primary/secondary rather than tertiary education (AOR 3.02, 95% CI 1.21–7.53; $p=0.018$), poor knowledge (AOR 2.89, 95% CI 1.59–5.24; $p<0.001$), low perceived susceptibility (AOR 2.45, 95% CI 1.34–4.48; $p=0.004$), perceived cost barrier (AOR 3.67, 95% CI 1.98–6.80; $p<0.001$), and outdoor-worker/student status compared with indoor employment (AOR 1.87, 95% CI 1.02–3.43; $p=0.043$).

The sample showed a gap between positive attitudes and protective practices. Cost, perceived susceptibility, knowledge, sex, education, and occupation were independently associated with poor practice. Because convenience sampling produced a predominantly young, tertiary-educated sample and the achieved sample was below the calculated target, findings should not be generalized to all adults in Otukpo without caution.

Introduction

Ultraviolet radiation (UVR) from sunlight is an established cause of skin and eye damage. Excessive exposure is associated with sunburn, premature skin aging, and skin cancers; UVR can also contribute to ocular conditions such as cataracts [1-3]. The World Health Organization recommends sun-

protection measures when the ultraviolet index is 3 or higher, including limiting exposure around midday, seeking shade, wearing protective clothing and a broad-brimmed hat, using protective sunglasses, and applying broad-spectrum sunscreen to skin that clothing does not cover [1,4]. Evidence supports a combined approach rather than reliance on sunscreen alone [5-7].

Although darker skin generally has greater natural protection against UVR than lighter skin, it does not eliminate the risk of sun damage or skin cancer. A systematic review of skin cancer in people of color emphasized that risk, presentation, and outcomes vary across populations and that skin cancer can be overlooked or diagnosed late in people with darker skin [8]. Evidence reviewed for African populations similarly identifies high ambient UVR in many settings and highlights gaps in population-level data and photoprotection access [2,3]. Sun protection therefore remains relevant for people with a wide range of skin tones, particularly those with prolonged outdoor exposure.

Knowledge and favorable attitudes do not always translate into preventive behavior. Knowledge–attitude–practice surveys can help describe this gap, but findings depend on the sampling strategy, the questions used, and the way scores are defined [9]. The Health Belief Model provides a complementary framework by considering perceived susceptibility and severity, perceived benefits and barriers, cues to action, and self-efficacy as influences on health behavior [10,11]. Reviews of sun-protection behavior identify multiple individual, social, and environmental determinants, including affordability, access, perceived personal risk, and the availability of practical protective options [6,7]. Nigerian studies illustrate this gap. In Lagos, a cross-sectional study of medical students found that only 28.2% currently used sunscreen despite generally favorable knowledge, with cost and the belief that sunscreen was unnecessary for Black skin commonly reported as barriers [12]. A study among farmers in southeastern Nigeria likewise documented poor sun-safety practice despite high knowledge [13]. More broadly, a systematic review of solar UV radiation in Africa highlighted the limited population-based evidence available across the region [2].

Otukpo Local Government Area in Benue State, Nigeria, includes residents engaged in education, trading, farming, and other activities that may involve outdoor exposure. Local evidence can help identify the specific barriers that public-health messaging should address. This study assessed knowledge, attitudes, and practices related to skincare and sun protection among adults in Otukpo and examined sociodemographic and psychosocial factors associated with poor practice.

2. Methods

2.1 Study design and setting

This was a cross-sectional analytical survey conducted in Otukpo Local Government Area, Benue State, Nigeria, between June and September 2025.

2.2 Study population and eligibility

The target population comprised adults aged 18–65 years who had resided in Otukpo for at least one year and who provided informed consent. Pregnant women with dermatological changes, people with diagnosed chronic skin disease under specialist care, and people unable to communicate or unwilling to consent were excluded.

2.3 Sample size and sampling

The sample size was calculated using Cochran's formula, $n_0 = Z^2pq/d^2$, with $Z=1.96$, $p=0.50$, $q=0.50$, and $d=0.05$, yielding 384.16 (approximately 384). Allowing for 10% non-response, the planned sample was 427. In total, 200 questionnaires were administered and 184 valid responses (92.0%) were analyzed; the achieved sample was therefore below the planned sample size. Participants were recruited by convenience sampling through a KoboToolbox questionnaire shared through WhatsApp and community contacts, with interviewer-assisted completion also used. Duplicate entries and responses from people outside Otukpo were removed during data cleaning.

2.4 Data collection instrument and measures

A structured questionnaire was adapted from prior knowledge, attitude, and practice instruments and informed by the Health Belief Model. It covered sociodemographic characteristics, knowledge of UVR and skin cancer, attitudes toward sun protection, protective practices, and Health Belief Model constructs. Knowledge was classified using four risk-recognition items (sunburn, premature aging, skin cancer, and eye damage); “do not know” was recorded as a separate response option and was not counted as a risk. Respondents who identified at least three risks were classified as having good knowledge.

Attitude was summarized using responses about the importance and perceived necessity of sun protection. Practice indicators were sunscreen use, avoidance of sun exposure between 12:00 and 15:00, and use of protective clothing, wide-brimmed hats, or umbrellas. Overall practice was classified as good if a respondent met at least one of these three criteria, and as poor otherwise.

Three public-health and dermatology experts reviewed the instrument, and a pilot test involving 30 respondents in Apa LGA yielded Cronbach's alpha coefficients of 0.78 for knowledge, 0.81 for attitude, 0.76 for practice, and 0.84 for the Health Belief Model items.

2.5 Statistical analysis

Data were analyzed using IBM SPSS Statistics version 27. Descriptive statistics summarized participant characteristics and knowledge, attitude, and practice responses. Chi-square tests were used to examine associations between sociodemographic variables and practice. Binary logistic regression was then performed, with poor practice coded as 1 and good practice as 0; variables with $p < 0.20$ in bivariate analysis were entered into the multivariable model. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) are reported, and $p < 0.05$ was considered statistically significant. The study is reported in accordance with the STROBE guidelines for cross-sectional studies [14].

2.6 Ethical considerations

Ethical principles were strictly adhered to during the conduct of this study. Written informed consent was obtained from all participants. Permission was also obtained from local authorities and traditional leaders. Participation was voluntary, responses were kept confidential, and data were stored securely.

3. Results

3.1 Sociodemographic characteristics

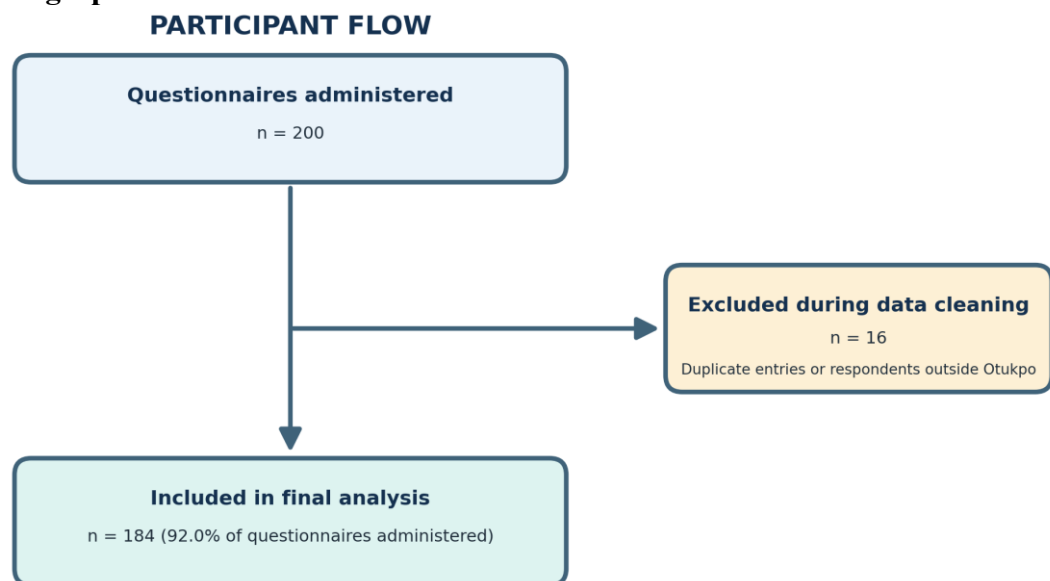


Figure 1. Participant flow for the cross-sectional survey

A total of 184 respondents were included (Figure 1). The sample was predominantly young, single, tertiary-educated, and student-based (Table 1).

Table 1. Sociodemographic characteristics of respondents (n=184)

Characteristic	Category	n	%
Sex	Male	97	52.7
	Female	87	47.3
Age (years)	18–24	138	75.0
	25–34	28	15.2
	35–49	10	5.4
	50 and above	8	4.3
Education	Primary	3	1.6
	Secondary	8	4.3
	Tertiary	173	94.0
Occupation	Student	145	78.8
	Employed	14	7.6
	Self-employed	12	6.5
	Unemployed/retired	13	7.1
Marital status	Single	171	92.9
	Married	12	6.5
	Widowed/divorced	1	0.5

Percentages may not total 100 because of rounding.

3.2 Knowledge of sun exposure risks

Good knowledge was reported for 112 respondents (60.9%), while 72 (39.1%) were classified as having poor knowledge. Sunburn was the most frequently recognized risk (82.1%); fewer respondents identified premature aging (46.2%) and eye damage (44.0%).

Table 2. Knowledge of risks associated with sun exposure (n=184)

Item	n	%
Recognized sunburn	151	82.1
Recognized premature aging	85	46.2
Recognized skin cancer	107	58.2
Recognized eye damage	81	44.0
Selected “do not know”	22	12.0
Good overall knowledge	112	60.9
Poor overall knowledge	72	39.1

Note: Individual risk items may allow multiple responses; therefore, item percentages are not expected to sum to 100%.

3.3 Attitudes toward sun protection

Most respondents considered sun protection important (158; 85.9%), and 146 (79.3%) considered skincare necessary. A total of 152 (82.6%) agreed or strongly agreed that skin protection was very important.

Table 3. Attitudes toward sun protection (n=184)

Measure	Response	n	%
Importance of sun protection	Very important/important	158	85.9
	Neutral/not important	26	14.1
Belief that skincare is necessary	Yes	146	79.3
	No/not sure	38	20.7
Agreement that skin protection is very important	Agree/strongly agree	152	82.6
	Neutral/disagree	32	17.4

3.4 Sun-protection practices

Daily sunscreen use was reported by 42 respondents (22.8%); 94 (51.1%) reported never using sunscreen. Only 28 (15.2%) reported avoiding sun exposure between 12:00 and 15:00, and 42 (22.8%) reported using protective clothing, wide-brimmed hats, or umbrellas. Overall, 126 respondents (68.5%) were classified as having poor practice and 58 (31.5%) as having good practice under the study's reported definition.

Table 4. Sun-protection practices (n=184)

Practice measure	Response	n	%
Frequency of sunscreen use	Daily	42	22.8
	Occasionally/weekly/monthly	48	26.1
	Never/do not use	94	51.1
Avoidance of 12:00–15:00 sun	Yes	28	15.2
	No	156	84.8
Protective clothing/hat/umbrella	Yes	42	22.8
	No	142	77.2
Overall practice classification	Good practice	58	31.5
	Poor practice	126	68.5

3.5 Factors associated with poor practice

Multivariable logistic regression identified six variables independently associated with poor sun-protection practice (Table 5). Cost barrier had the largest adjusted odds ratio (AOR 3.67), followed by education (AOR 3.02), poor knowledge (AOR 2.89), low perceived susceptibility (AOR 2.45), male sex (AOR 2.14), and occupation (AOR 1.87).

Table 5. Multivariable logistic regression of factors significantly associated with poor sun-protection practice (n=184)

Variable	Comparison	AOR	95% CI	p-value
Sex	Male vs female (reference)	2.14	1.18–3.87	0.012
Education	Primary/secondary vs tertiary (reference)	3.02	1.21–7.53	0.018
Knowledge	Poor vs good (reference)	2.89	1.59–5.24	<0.001
Perceived susceptibility	No/not sure vs yes (reference)	2.45	1.34–4.48	0.004
Cost barrier	Yes vs no (reference)	3.67	1.98–6.80	<0.001
Occupation	Outdoor worker/student vs indoor employment (reference)	1.87	1.02–3.43	0.043

AOR, adjusted odds ratio; CI, confidence interval. Poor practice was coded as 1 and good practice as 0; reference categories are shown in the Comparison column.

4. Discussion

In this convenience sample, knowledge and stated attitudes toward sun protection were relatively favorable, but reported protective practices were uncommon. Although 60.9% were classified as having good knowledge and 85.9% considered sun protection important, only 22.8% reported daily sunscreen use, 15.2% reported avoiding the midday period specified in the questionnaire, and 68.5% were classified as having poor overall practice. This gap suggests that awareness alone may not be sufficient to support routine protective behavior, consistent with reviews finding that sun-protection practices are shaped by a combination of knowledge, access, perceived barriers, and social and environmental context [6,7]. This pattern resembles findings among medical students in Lagos, where current sunscreen use was 28.2% and cost and low perceived need for darker skin were frequently reported barriers [12]. Among farmers in southeastern Nigeria, 52.3% had poor sun-safety practice despite 89.7% being classified as knowledgeable [13]. These comparisons support the relevance of the knowledge–practice gap, while differences in population and measurement mean that the percentages should not be treated as directly comparable.

The results are consistent with public-health guidance that recommends combining measures rather than relying on sunscreen alone. Shade, clothing, hats, and sunglasses can provide practical protection, while sunscreen is useful for exposed skin [1,4,7]. Evidence reviews support sunscreen as one component of photoprotection and describe evidence linking regular use with prevention of some UV-related outcomes [5,15]. In settings where sunscreen is expensive or difficult to obtain, low-cost protective clothing and access to shade may be particularly important [2,6,7]. The study's finding that a perceived cost barrier had the largest adjusted odds ratio supports attention to affordability, although the cross-sectional design cannot establish that cost caused poor practice.

Poor knowledge and low perceived susceptibility were also associated with poor practice in the multivariable model. These findings are compatible with the Health Belief Model, in which perceived risk and perceived barriers influence preventive behavior [10,11]. Public-health communication should explain that darker skin reduces but does not eliminate UV-related risk, and should provide practical guidance about protective clothing, shade, sunglasses, and appropriate sunscreen use [1,2,8]. Such messaging should avoid implying that sunscreen alone makes prolonged exposure safe [1,7].

Male sex, lower educational attainment, and the combined category of students and outdoor workers were additional correlates of poor practice. These associations may help identify groups for targeted communication, but their interpretation is constrained by the sample composition: three-quarters of respondents were aged 18–24 years, 78.8% were students, and 94.0% had tertiary education. The convenience sample is not representative of the full adult population of Otukpo.

Several measurement issues also affect interpretation. Good practice was defined as meeting any one of three protective behaviors, which may overstate the adequacy of protection among respondents who perform only one behavior, and knowledge was classified using four risk-recognition items rather than a comprehensive knowledge scale. Future studies should pre-specify and report the scoring algorithm, present the distribution of composite scores, and consider validated multi-behavior measures. Although the questionnaire covered several Health Belief Model constructs, Table 5 presents only the six statistically significant associations, of which perceived susceptibility and cost barriers were the only Health Belief Model constructs; conclusions about the effects of other constructs cannot be drawn from these data.

5. Strengths and limitations

The study provides locally collected data on sun-protection knowledge, attitudes, practices, and correlates in Otukpo, an area with limited local evidence. Use of a structured questionnaire that was pilot-tested, and reporting of adjusted odds ratios, are additional strengths. However, convenience sampling and digital distribution may have excluded adults with limited internet access and contributed to the high proportion of young students. The achieved sample (184) was below the calculated target (427), reducing precision and limiting generalizability. Only 11 respondents had primary or secondary education, so the estimate for education is imprecise, and the occupation variable combined students and outdoor workers, so it should be interpreted cautiously. The practice classification, which required only one protective behavior, may overestimate adequate protection. Self-reported practices may be affected

by recall and social-desirability bias. The cross-sectional design cannot establish temporality or causality.

6. Conclusion

Among the 184 adults surveyed in Otukpo, favorable attitudes and moderate knowledge coexisted with low reported use of sun-protection measures. Poor overall practice was reported in 68.5% of respondents. The regression analysis identified sex, education, knowledge, perceived susceptibility, perceived cost barriers, and occupation as factors associated with poor practice. These findings should be interpreted as associations within a convenience sample rather than population estimates or causal effects.

7. Recommendations

Public-health education in Otukpo should emphasize that all skin tones can experience UV-related damage and promote a combination of shade, protective clothing, broad-brimmed hats, sunglasses, and sunscreen on uncovered skin. Messages should be tailored to students and people with outdoor work, and should address affordability and misconceptions about personal risk. Community health workers, schools, markets, and local media could be used to disseminate practical advice. Future research should use probability-based or more geographically balanced sampling, define the practice score in advance, report all Health Belief Model constructs included in the final model, and provide the full statistical output and anonymized dataset where ethically permissible. Intervention planning may draw on reviews of sun-protection programs, while recognizing that evidence of effectiveness varies by setting and population [7,16].

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