Knowledge, Attitude and Practices of Traffic Enforcers on Sun Exposure and Sun Protection: A Cross-sectional Study

Jennifer Lavina T. Ngo, MD, MBA and Francisco D. Rivera IV, MD

Department of Dermatology, Rizal Medical Center, Pasig City, Philippines

ABSTRACT

Background. Prolonged sun exposure without adequate sun protection places outdoor workers such as traffic enforcers at risk for skin cancer. Data on knowledge, attitude, and practices amongst traffic enforcers are currently unavailable, hence the need for research on this matter.

Objectives. 1) To evaluate the knowledge, attitude, and practices of traffic enforcers on sun exposure and sun protection, 2) To identify any association with sociodemographic characteristics, and 3) To determine whether knowledge and attitude are correlated with sun-protective practices.

Method. An analytical cross-sectional study was conducted from January to February 2019 among traffic enforcers in Pasig City, Philippines thru a self-administered questionnaire. Descriptive statistics were used to summarize the sociodemographic profile of the respondents while the Fisher's exact/Chi-square test was used to determine the association between sociodemographic variables and adequacy of knowledge, attitude, and practices. Pearson's rho was used to determine the degree of association between knowledge, attitude, and practices.

Results. A total of 178 traffic enforcers with a 100% response rate participated in the study. 94.4% had adequate knowledge and 93.8% had a desirable attitude as opposed to 46.1% who had adequate sun-protective practices. Adequate knowledge was found to be significant when obtained from television (51.19% at p=0.018), with the respondents being least knowledgeable about proper sunscreen use. Only a few had the desired positive attitude that sunscreen is not an added expense at 39.89%. The most common methods of sun protection were the wearing of sunglasses (82.02%), long-sleeved clothing (68.54%), and the wearing of a wide-brimmed hat (65.17%). Reapplication of sunscreen was the least common at 32.02%. Those with an adequate sun-protective practice obtained their knowledge from social media (48.78% at p=0.003). Adequacy of knowledge when compared to actual practice noted that there were more respondents with poor knowledge translating to poor practice (9.38% at p=0.019). There was insufficient evidence to state associations between the sociodemographic profile and knowledge, attitude, or practice. Correlations between knowledge, attitude, and practices on sun exposure and sun-protective practices were found to be weak.

Conclusion. Most of the traffic enforcers who participated in this study had adequate knowledge and a desirable attitude on sun exposure and sun protection but had inadequate sun-protective practices, emphasizing the need to investigate other factors that hinder translation of adequate knowledge and attitude to adequate practice. Occupational health policies need to be implemented to reduce the harmful effects of UV radiation in high-risk populations such as traffic enforcers.

Keywords: KAP, sun exposure, sun protection, traffic enforcers

Poster presented at the 119th Annual Meeting of the Japanese Dermatological Association on June 2020, at Kyoto, Japan.

Poster presented at the 24th Regional Congress of Dermatology 2020 (Asian-Australasian) on February 2020, at Bangkok, Thailand.

Paper received an award at the 17th National Medical Writing Workshop and 10th Writeshop for Young Researchers.

Corresponding author: Jennifer Lavina T. Ngo, MD, MBA
Department of Dermatology
Rizal Medical Center
Pasig Blvd., Pasig City, Philippines
Email: jenniferlavinango@yahoo.com

INTRODUCTION

Ultraviolet (UV) radiation exposure is one of the most significant risk factors for developing skin cancer.[1] While a history of intense blistering sunburn predisposes an individual to develop melanoma, a history of chronic or occupational sun exposure and intermittent, recreational, sun exposure in childhood and during one's lifetime increases the risk for squamous cell carcinoma and basal cell carcinoma, respectively.[2] Regardless of the type of skin cancer, these factors affect outdoor workers, defined as those who work outdoors for at least three hours between 9 am - 3 pm most days of the week and are sun-exposed well above the recommended limits, often without adequate sun protection.[1] Traffic enforcers, whose job requires for them to facilitate the flow of traffic on the streets, at certain times of the day, under the sun, belong to this population. However, there is no concrete epidemiological data on skin cancer available in the Philippines and the world on this specific population, hence the need for this study.

Primary prevention of disease works by decreasing unhealthy behaviors that put a specific population at risk. According to the World Health Organization, the most important sun-protective practices include the following: limited time in the midday sun (11 am to 4 pm), seeking shade, wearing protective clothing, wearing a wide-brimmed hat, use of sunscreen with SPF (sun protection factor) ≥30 and use of sunglasses.[3] Most knowledge, attitude, and practices (KAP) studies have determined that there is much awareness of the risks of sun exposure, but with little practice of sun protection.[4] Considering the occupation that puts them at risk, there has been no preventive program established to protect traffic enforcers from skin cancer. Through this study, the researcher aims to determine the KAP of outdoor workers, particularly traffic enforcers, on sun exposure and sun protection to be able to promote and strengthen public health strategies, including job-related policies for outdoor workers, to eliminate one of the most preventable causes of skin cancer in this population.

The objective of this study is to evaluate the KAPs of traffic enforcers on sun exposure and sun protection and to identify any association with sociodemographic characteristics, as well as to determine the correlation between knowledge and attitude on sun exposure and sun protection with sun-protective practices.

METHODOLOGY

Study Design

An analytical cross-sectional study was conducted from January to February 2019 among traffic enforcers in Pasig City, Philippines thru a self-administered questionnaire.

Inclusion and Exclusion Criteria

Traffic enforcers aged 20 and above, belonging to both sexes, and who were able to understand written English or Filipino were included in this study. Conversely, traffic enforcers who were unable to understand written English or Filipino, and who were unable to give informed consent or who refused to give and sign the informed consent form were excluded.

Variables

The dependent variables were: 1) the level of knowledge regarding sun exposure and sun protection (adequate or inadequate), 2) the type of attitude towards sun exposure (desirable or undesirable), and 3) the type of practices towards sun exposure (adequate or inadequate).

The independent variables on the other hand were: 1) age, 2) sex, 3) educational attainment, 4) family history of skin cancer and 5) source of knowledge on sun exposure and sun protection.

Data Collection

A self-administered questionnaire was utilized in the study, with questions and scoring based on two local studies on KAP on sun exposure and sun protection among laypersons, health personnel[3] and adult triathletes.[4] Modifications were made to the questionnaires to adapt to traffic enforcers.

The questionnaire was divided into four sections: 1) sociodemographic profile, 2) knowledge, 3) attitude and 4) practices concerning sun exposure and sun protection. The sociodemographic profile was obtained through age, sex, educational attainment, skin type, family history of skin cancer, and source of information for their knowledge on sun exposure and sun protection.[3]

The questions were written in English, translated to Filipino by a licensed Filipino teacher, and was evaluated by the consultant and resident staff of a tertiary hospital in Pasig. The feasibility of answering the questionnaire was assessed through a face validity conducted by the researcher on five adult Filipinos of similar educational attainment with the traffic enforcers.

Convenience sampling was done by distributing the study questionnaires and informed consent forms[5] during one of the institution's weekly general assembly. Recruitment was done among those present during the assembly, with the targeted sample size obtained in just one visit.

Participation in this study was entirely voluntary without any compensation.

Variables

Knowledge

Knowledge was assessed through a "knowledge score" by assigning one point to every correct answer the participant gave to the 14 questions on knowledge of sun exposure and

sun protection[4]: 1) "Sun exposure can lead to skin darkening", 2) "Sun exposure causes sunburns", 3) "Sun exposure causes wrinkling of the skin", 4) "Sun exposure can cause skin cancer", 5) "Sun exposure is only harmful if you get burned, 6) "The most dangerous time to be sun-exposed is between 10 am and 4 pm", 7) "I need to protect myself from the sun even on a cloudy day", 8) "Sun exposure to the face is as harmful as sun exposure to other parts of the body", 9) "People with dark skin also need to use sunscreen", 10) "The use of sunscreen will prevent skin cancer", 11) "Sunscreen should have an SPF ≥30", 12) "One-time application of sunscreen is not enough to protect my skin for the entire day", 13) "Sunscreen should be applied at least 20 minutes before sun exposure", and 14) "Skin cancer can be fatal".

A knowledge score of at least 50% (7 out of 14) was considered as having adequate knowledge based on two local studies on KAP on sun exposure and sun protection.[3-4] The association between adequate knowledge and socio-demographic variables was then assessed to determine the presence of a correlation between these variables.

Attitude

Attitude towards sun exposure was measured by a three-point Likert scale (1 – Disagree, 2- Neutral, 3 – Agree) where a desirable attitude towards sun exposure and sun protection was defined as having "agree" as a response to the 9 statements: 1) "My skin will age quickly and have wrinkles if I spend time in the sun", 2) "I am aware that being under the sun for too long may cause skin cancer", 3) "Prolonged sun exposure is not good for my body", 4) "Sunscreen is not a cosmetic or make-up", 5) "Sunscreen is for both men and women", 6) "Sunscreen is not an added expense and is practical to use", 7) "Sunscreen is like lotion, and is not uncomfortable to use", 8) "Sunscreen can be worn every day and not only when going to the beach", and 9) "It's worth taking the trouble to apply sunscreen while stationed at my post to avoid sun damage and skin cancer".

A score of at least 52% (14 out of the best possible score of 27) was considered as having a desirable attitude towards sun exposure and sun protection based on two local studies on KAP on sun exposure and sun protection.[3-4]

The association between having a desirable attitude towards sun exposure and sun protection and socio-demographic variables was also assessed to determine the presence of a correlation between these variables.

Practices

Sun-protective practices were asked through the following statements: 1) "Staying in the shade", 2) "Wearing a wide-brimmed hat", 3) "Wearing sunglasses", 4) "Wearing a long-sleeved shirt or short-sleeved shirt with added arm sleeves and long pants", 5) "Wearing dark-colored clothing for sun protection", 6) "Applying sunscreen of SPF ≥30", 7) "Applying sunscreen at least 20 minutes before sun exposure", and 8) "Reapplying sunscreen every 3-4 hours".

Having at least five sun-protective practices was considered as having an adequate practice based on two local studies on KAP on sun exposure and sun protection.[3-4] The association between these protective practices and sociodemographic variables, as well as having a desirable attitude, was also assessed to determine the presence of a correlation between these variables.

Sample Size

The sample size was computed to be at 110 to achieve a power of 90% based on the proportion of the general population who was aware of the relationship between sun exposure and skin cancer at 55.3%. This is as compared to the hypothesized proportion of traffic enforcers with the same awareness at 70%.[6]

Statistical Analysis

Descriptive statistics were used to summarize the general and clinical characteristics of the participants. Frequency and proportion were used for nominal variables, median and range for ordinal variables, and mean and standard deviation for interval/ratio variables. Fisher's exact / Chi-square test was used to determine if there was an association between respondent profile and adequacy of knowledge, attitude, and practices on sun exposure and sun protection. Pearson's rho was used to determine the degree of association between knowledge, attitude, and practices.

All valid data were included in the analysis. Missing variables were neither replaced nor estimated. The null hypothesis was rejected at 0.05α-level of significance. STATA 15.0 was used for data analysis.

Ethical Considerations

Approval for the execution of this study was obtained from the Technical Review Board of the Rizal Medical Center Research Committee since it was exempted from review by the institution's Ethics Committee after it was evaluated to be of minimal risk. The researcher also obtained authorization from the head of the Traffic and Parking Management Office in Pasig City, Metro Manila, Philippines. Participants were all assigned initials as code names and confidentiality was maintained as responses were only accessed by the researchers.

RESULTS

This study included the responses of 178 traffic enforcers in Pasig City with a 100% response rate, which is beyond the minimum targeted sample size of 110, thereby increasing power to 98.37%. The majority were male (75.28%) whose ages ranged from 31 to 50 (Table 1). More than half were high school graduates (64.04%). Only one had a known history of skin cancer in the family. With regards to skin color, the majority reported a Fitzpatrick skin type III (medium complexion) (60.67%) while 22.47% of them reported having a Fitzpatrick skin type II (fair skin).

Table 1. Sociodemographic profile of traffic enforcers in Pasig (n=178)

	Frequency (%); Mean ± SD
Age, years	
20-30	23 (12.92)
31-40	66 (37.08)
41-50	68 (38.2)
≥ 51	21 (11.8)
Sex	
Male	134 (75.28)
Female	44 (24.72)
Educational attainment	
High school	114 (64.04)
College	41 (23.03)
Vocational course	23 (12.92)
With history of skin cancer in the family	1 (0.56)
Fitzpatrick Skin Type (Color of skin)	
I (Very fair)	3 (1.69)
II (Fair)	40 (22.47)
III (Medium)	108 (60.67)
IV (Olive)	22 (12.36)
V (Brown)	4 (2.25)
VI (Dark brown)	1 (0.56)

Table 2. The proportion of respondents with good KAP (n = 178)

	Frequency (%)
Adequate knowledge	168 (94.4)
Desirable attitude	167 (93.8)
Adequate practice (at least five protective practices)	82 (46.1)

An overall review of the survey revealed that 94.4% had adequate knowledge and 93.8% had a desirable attitude on sun exposure. On the contrary, only 46.1% had an adequate practice of protecting themselves from sun exposure (Table 2).

Knowledge

The specific findings on knowledge of sun exposure and sun protection are shown in Table 3. The respondents' most common sources of information were the television (48.88%), social media (37.08%), and the workplace (34.83%).

Most of the respondents knew that sun exposure can lead to skin darkening (92.7%), that it causes sunburns (92.7%), and that the most dangerous time to be exposed is between 10 AM to 4 PM (93.82%). 60.67% believed that sun exposure is only harmful if you get sunburned, whereas only 71.91% knew that sunscreen should be applied at least 20 minutes before sun exposure. Furthermore, only 72.47% of them knew that the use of sunscreen will prevent skin cancer and that one-time application is not enough for the entire day.

Table 3. Knowledge on sun exposure and sun protection of traffic enforcers (n=178)

		Frequency of answered *Yes/True* (%)
	Source of knowledge on sun exposure and sun protection	
	Social media	66 (37.08)
	TV	87 (48.88)
	Newspaper and magazine	23 (12.92)
	Relatives and friends	25 (14.04)
	School	38 (21.35)
	Work	62 (34.83)
K1	Sun exposure can lead to skin darkening	165 (92.7)
K2	Sun exposure causes sunburns	165 (92.7)
K3	Sun exposure causes wrinkling of the skin	135 (75.84)
K4	Sun exposure can cause skin cancer	145 (81.46)
K5	Sun exposure is only harmful if you get burned	108 (60.67)
K6	The most dangerous time to be sun-exposed is between 10 am and 4 pm	167 (93.82)
K7	I need to protect myself from the sun even on a cloudy day	137 (76.97)
K8	Sun exposure to the face is as harmful as sun exposure to other parts of the body	156 (87.64)
K9	People with dark skin also need to use sunscreen	158 (88.76)
K10	The use of sunscreen will prevent skin cancer	129 (72.47)
K11	Sunscreen should have an SPF ≥30	135 (75.84)
K12	Sunscreen should be applied at least 20 minutes before sun exposure	128 (71.91)
K13	A one-time application of sunscreen is NOT enough to protect my skin for the entire day	129 (72.47)
K14	Skin cancer can be fatal	137 (76.97)

Table 3.1. Respondent profile and adequacy of knowledge on sun exposure and sun protection (n=178)

	Good knowledge (n=168)	Poor knowledge (n=10)	p-value
Age, years			0.324
20-30	20 (11.9)	3 (30)	
31-40	63 (37.5)	3 (30)	
41-50	64 (38.1)	4 (40)	
≥ 51	21 (12.5)	0	
Sex			1.000
Male	126 (75)	8 (80)	
Female	42 (25)	2 (20)	
Educational attainment			0.072
High school	107 (63.69)	7 (70)	
College	41 (24.4)	0	
Vocational course	20 (11.9)	3 (30)	
With history of skin cancer in the family	1 (0.6)	0	1.000
Source of knowledge on sun exposure and sun protection			
Social media	64 (38.1)	2 (20)	0.327
TV	86 (51.19)	1 (10)	0.018
Newspaper and magazine	23 (13.69)	0	0.364
Relatives and friends	35 (20.83)	3 (30)	0.361
School	35 (20.83)	3 (30)	0.447
Work	57 (33.93)	5 (50)	0.321

Statistical test used: Fisher's exact/Chi-square test

Among the sociodemographic variables assessed, the only significant factor affecting knowledge was the source of knowledge on sun exposure and sun protection, with television providing better knowledge of sun exposure and sun protection (51.19% versus 10%, p=0.018) (Table 3.1). All the other variables did not.

Attitude

In terms of attitude on sun exposure and sun protection, more than half agreed that sunscreen can be worn daily and not just on the beach (62.36%), that it is worth taking time to apply the sunscreen while working to avoid sun damage and skin cancer (62.36%), and that prolonged exposure may cause skin cancer (61.24%) (Table 4). However, only a few had the desired positive attitude that sunscreen is not an added expense and is practical to use (39.89%) and the desired negative attitude that the skin will age quickly and have wrinkles if they spend time in the sun (47.75%).

Results of our study showed insufficient evidence to state possible associations between the respondent profile and their attitude on sun exposure and sun protection due to the lack of statistical significance (Table 4.1).

Table 4. Attitudes on sun exposure and sun protection of traffic enforcers (n=178)

		Disagree	Neutral	Agree
			Frequency (%)	
A1	My skin will age quickly and have wrinkles if I spend time in the sun	39 (21.91)	54 (30.34)	85 (47.75)
A2	I am aware that being under the sun for too long may cause skin cancer	29 (16.29)	40 (22.47)	109 (61.24)
A3	Prolonged sun exposure is not good for my body	24 (13.48)	35 (19.66)	119 (66.85)
A4	Sunscreen is not a cosmetic or make-up	50 (28.09)	24 (13.48)	104 (58.43)
A5	Sunscreen is for both men and women	21 (11.8)	18 (10.11)	139 (78.09)
A6	Sunscreen is not an added expense and is practical to use	35 (19.66)	72 (40.45)	71 (39.89)
A7	Sunscreen is like lotion and is not uncomfortable to use	25 (14.04)	30 (16.85)	123 (69.1)
A8	Sunscreen can be worn every day and not only when going to the beach	33 (18.54)	34 (19.1)	111 (62.36)
A9	It is worth taking the trouble to apply sunscreen while stationed at my post to avoid sun damage and skin cancer	36 (20.22)	31 (17.42)	111 (62.36)

Table 4.1. Respondent profile and attitude on sun exposure and sun protection (n=178)

	Good attitude (n=167)	Poor attitude (n=11)	p-value
Age, years			0.781
20-30	22 (13.17)	1 (9.09)	
31-40	60 (35.93)	6 (54.55)	
41-50	65 (38.92)	3 (27.27)	
≥ 51	20 (11.98)	1 (9.09)	
Sex			1.000
Male	125 (74.85)	9 (81.82)	
Female	42 (25.15)	2 (18.18)	
Educational attainment			0.422
High school	105 (62.87)	9 (81.82)	
College	39 (23.35)	2 (18.18)	
Vocational course	23 (13.77)	0	
With history of skin cancer in the family	1 (0.6)	0	1.000
Source of knowledge on sun exposure and sun protection			
Social media	61 (36.53)	5 (45.45)	0.539
TV	81 (48.50)	6 (54.55)	0.763
Newspaper and magazine	20 (11.98)	3 (27.27)	0.155
Relatives and friends	23 (13.77)	2 (18.18)	0.655
School	34 (20.36)	4 (36.36)	0.251
Work	61 (36.53)	5 (45.45)	0.750
Adequacy of knowledge on sun exposure and sun protection			0.481
Inadequate	158 (94.61)	10 (90.91)	
Adequate	158 (94.61)	10 (90.91)	

Statistical test used: Fisher's exact/Chi-square test

Table 5. Practices related to sun exposure and sun protection of traffic enforcers (n=178)

		Frequency (%)
P3	Wearing sunglasses	146 (82.02)
P4	Wearing a long-sleeved shirt or short-sleeved shirt with added arm sleeves and long pants	122 (68.54)
P2	Wearing a wide-brimmed hat	116 (65.17)
P5	Wearing dark-colored clothing for sun protection	90 (50.56)
P6	Applying sunscreen of SPF ≥30	86 (48.31)
P7	Applying sunscreen at least 20 minutes before sun exposure	85 (47.75)
P1	Staying in the shade	77 (43.26)
P8	Reapplying sunscreen every 3-4 hours	57 (32.02)

Practices

A review of the actual practices of traffic enforcers (Table 5) showed that majority wore sunglasses (82.02%) while more than half wore a long-sleeved shirt or short-sleeved shirt with added arm sleeves and long pants (68.54%), a wide-brimmed hat (65.17%), and dark-colored clothing as protection (50.56%). The least common methods for sun protection included reapplying sunscreen every 3-4 hours (32.02%), staying in the shade (43.26%), applying sunscreen at least 20 minutes before sun exposure (47.75%), and applying sunscreen of SPF≥30 (48.31%).

Statistical analysis revealed that those with adequate practice, in comparison to those with inadequate practice, got their information from social media (48.78% versus 27.08%, p=0.003) (Table 5.1). In comparison, those with inadequate practice got their information more from relatives and friends (19.79%, p=0.017) and school (29.17%, p=0.006).

Knowledge-Attitude-Practices (KAP) correlations

Knowledge, attitude, and practice scores were directly correlated with each other. This means that the higher the knowledge scores, the higher the attitude and practice scores, and vice versa. However, these correlations were very weak

Table 5.1. Respondent profile and practice on sun exposure and sun protection (n=178)

	Good practice (n=82)	Poor practice (n=96)	p-value
Age, years			0.450
20-30	13 (15.85)	10 (10.42)	
31-40	32 (39.02)	34 (35.42)	
41-50	30 (36.59)	38 (39.58)	
≥ 51	7 (8.54)	14 (14.58)	
Sex			0.137
Male	66 (80.49)	68 (70.83)	
Female	16 (19.51)	28 (29.17)	
Educational attainment			0.708
High school	50 (60.98)	64 (66.67)	
College	21 (25.61)	20 (20.83)	
Vocational course	11 (13.41)	12 (12.50)	
With history of skin cancer in the family	1 (1.22)	0	0.461
Source of knowledge on sun exposure and sun protection			
Social media	40 (48.78)	26 (27.08)	0.003
TV	35 (42.68)	52 (54.17)	0.127
Newspaper and magazine	7 (8.54)	16 (16.67)	0.107
Relatives and friends	6 (7.32)	19 (19.79)	0.017
School	10 (12.20)	28 (29.17)	0.006
Work	23 (28.05)	39 (40.63)	0.079
Adequacy of knowledge on sun exposure and sun protection			0.019
Inadequate	1 (1.22)	9 (9.38)	
Adequate	81 (98.78)	87 (90.63)	
Attitude on sun exposure and sun protection			0.197
Undesirable	3 (3.66)	8 (8.33)	
Desirable	79 (96.34)	88 (91.67)	

Statistical test used: Fisher's exact/Chi-square test

Table 6. The proportion of respondents with good KAP (n = 178)

	Correlation coefficient	Interpretation	p-value
Knowledge and Attitude scores	0.2525	Weak, direct	<0.001
Attitude and Practice scores	0.1780	Very weak, direct	0.018
Knowledge and Practice scores	0.4185	Moderate, direct	<0.001

Statistical test used: Pearson's rho

and moderate in magnitude due to the assumed linear relationships (Table 6).

DISCUSSION

KAP studies on sun exposure and sun protection have been conducted in the Philippines on different populations,[3-4] but not on outdoor workers such as traffic enforcers.

In general, this study revealed that the majority of traffic enforcers included in the study had good knowledge of sun exposure and sun protection. Although most of them were aware of the harmful effects of prolonged sun exposure such as sunburn, wrinkling, and risk of skin cancer and the dangerous time to be out in the sun, only a few of them were aware of the need to use dark-colored clothing and sunscreen as a form of protection while stationed at their post. In addition, the same proportion was not knowledgeable about the proper use of sunscreen in terms of time and frequency of reapplication. This is consistent with the results from KAP studies done on laypersons[3] and triathletes[4] conducted locally, and among traffic enforcers in Malaysia,[7] highlighting the need to focus on these aspects when educating these populations at risk.

In terms of attitude, a minority of the respondents did not think that sun exposure can lead to skin cancer, with some of them thinking that prolonged sun exposure was not harmful

to the body and that sunscreen was only worn when going to the beach, all highlighting the misconceptions associated with sunscreen use (Table 4). Moreover, only 39.89% thought that sunscreen is not an added expense, which can explain the reason behind their inadequate sunscreen use.

Similar to a previous study done by Al-Naggar[7] in Malaysia, the results of this study revealed that traffic enforcers had good sun-protective practices in terms of wearing sunglasses, clothing that covers most of the body, and a wide-brimmed hat.[7] However, the use of sunscreen and its proper application was consistently low among all respondents in this study (Table 5), which is congruent with previous studies done on laypersons[3], triathletes[4], traffic enforcers[7], and the general population.[6,8] Although sunscreen use has been established to prevent the harmful effects of UV radiation exposure such as skin cancer,[9] its inappropriate use in terms of the amount applied, the minimum SPF required, and the frequency of reapplication has been a barrier in achieving the most effective protection from sunscreen.[10-11]

As for their source of knowledge, the majority of the respondents obtained their knowledge from television and social media, and less from work (Table 3), with television (Table 3.1) and social media (Table 5.1) being statistically significant factors in having good knowledge and practice of sun exposure and sun protection. This finding can serve as a basis for the utilization of such media in the education and information dissemination of sun exposure and sun protection, specifically on proper sunscreen use, to the general population.

Further analysis showed that none of the sociodemographic variables were found to be statistically significant in its association with knowledge, attitude, and practice of sun exposure and sun protection among traffic enforcers in this study. This is in contrast to multiple studies done on KAP of the same topic in other populations where a higher socioeconomic status was associated with adequate sun-protective practices.[6,12-14] Conversely, a previous study on triathletes demonstrated a statistically significant association between a higher socioeconomic status and educational attainment with inadequate sun-protective practices.[4,11]

The results of this study finally reveal that traffic enforcers, who are sun-exposed most days of the week and well above the recommended limits, have adequate knowledge and a desirable attitude towards sun exposure but do not translate them to adequate practice. Furthermore, only one respondent reported a history of skin cancer in the family, which could be attributed to underreporting and the lack of a skin cancer registry in the country. The limitations of this study include the use of a self-administered questionnaire that is subject to social desirability, and generalizability to all traffic enforcers, as our respondents were all from Pasig City.

The findings in this study are likewise consistent with existing KAP studies on sun exposure and sun protection in that adequate knowledge and awareness on sun exposure and sun protection do not translate to adequate sun-protective practices,[3-4] emphasizing the need to eliminate factors contributing to hindrance. It is thus recommended that further investigation be done to identify other factors that enable or hinder the translation of adequate knowledge and desirable attitude to adequate practice. An expansion of this study is suggested through qualitative studies in the form of focused group discussions to determine the reasons behind inadequate sun-protective practices. Furthermore, due to the absence of local data on the burden of disease of skin cancer, a proper skin cancer registry containing respondent profiles with occupation should be created to better document the incidence and prevalence of skin cancer and to identify populations in need of more educational intervention.

Overall, this study recommends that an educational lecture on sun exposure and sun-protective practices be given to traffic enforcers as part of their job orientation. Provisions for sun protection such as dark-colored long-sleeved shirts and pants with wide-brimmed hats are also suggested to be part of their prescribed uniform. A bottle of sunscreen can also be supplied on a regular weekly basis as part of their benefits to help minimize the health hazards associated with prolonged sun exposure. Education, administrative controls, and provision of personal protective equipment ought to be part of an occupational health and safety policy that must be implemented for traffic enforcers.

As a whole, proper education and intervention in terms of accurate information dissemination should be done through television and social media as these were found to be the source of information among those with adequate knowledge on sun exposure and sun protection. Media, whether print, electronic, or print, was found to be an integral part of our daily lives in terms of social awareness and information gathering. This medium has a broader reach and will easily benefit the general public. Accuracy of information can also be ensured through monitoring as opposed to word-of-mouth, which was found to be an unreliable source of information, especially among those with inadequate sun-protective practices.

CONCLUSION

This study revealed that traffic enforcers, who are sun-exposed most days of the week and well above the recommended limits, have adequate knowledge and a desirable attitude towards sun exposure and sun protection but do not translate them to adequate practice. Further studies to investigate other factors that enable or hinder the translation of adequate knowledge and desirable attitude to adequate practice is recommended to fully understand this phenomenon. Meanwhile, occupational health and safety policies consisting of education, administrative controls, and provision of personal protective equipment should be implemented to help ensure the safety and overall well-being of traffic enforcers.

Statement of Authorship

JLTN did the data collection. Both authors participated in the conception, analysis and interpretation, and writing and approved the final version submitted.

Author Disclosure

Both authors declared no conflicts of interest.

Funding Source

This study was entirely funded by the corresponding author.

REFERENCES

1. Janda M. What encourages sun protection among outdoor workers from four industries? J Occup Health. 2014;56(1):62-72.
2. World Health Organization. RadiationL Ultraviolet (UV) radiation and skin cancer [Internet]. Geneva: WHO; c2018 [cited 2018 Mar 5]. Available from https://www.who.int/news-room/q-a-detail/radiation-ultraviolet-(uv)-radiation-and-skin-cancer.
3. Siripunvarapon A, Parado I, Frez M. Knowledge, attitudes and practices concerning sun exposure and sun protection among lay persons and health personnel at a tertiary care hospital in the Philippines. Jour Phil Derm Soc. 2014;23(1):16-23.
4. Guevara BG, Guillano VP, Bunagan MJ, Concha A. Knowledge, attitudes and practices concerning sun exposure and sun protection among adult triathletes in Metro Manila, Cebu and Davao City, Philippines: A cross-sectional study. Jour Phil Derm Soc. 2016;25(1):19-26.
5. World Health Organization. Templates for informed consent forms [Internet]. Geneva:World Health Organization; c2018 [cited 2018 Mar 18]. Available from http://www.who.int/rpc/research_ethics/informed_consent/en/
6. AlGhamdi K, AlAklabi A, AlQahtani, A. Knowledge, attitudes and practices of the general public toward sun exposure and protection: A national survey in Saudi Arabia. Saudi Pharm J. 2016;24(6):652-7.
7. Al-Naggar R. Practice of skin cancer prevention among road traffic police officers in Malaysia. Asian Pac J Cancer. 2013;14(8):4577-81.
8. Lindstrom AR, von Schuckmann LA, Hughes MCB, Williams GM, Green AC, van der Pols JC. Regular Sunscreen Use and Risk of Mortality: Long-Term Follow-up of a Skin Cancer Prevention Trial. Am J Prev Med. 2019 May;56(5):742-46.
9. Silva ESD, Tavares R, Paulitsch FDS, Zhang L. Use of sunscreen and risk of melanoma and non-melanoma skin cancer: a systematic review and meta-analysis. Eur J Dermatol. 2018 Apr 1;28(2):186-201.
10. Scerri L, Aquilina S, Gauci AA, Dalmas M. Sun awareness and sun protection practices in Malta. JEADV. 2002;16:47-52.
11. Stanton WR, Janda M, Baade PD, Anderson A. Primary prevention of skin cancer: a review of sun protection in Australia and internationally. Health Promotion International. 2004;19(3):369-78.
12. Rosenman KD, Gardiner J, Swanson GM, Mullan P, Zhu Z. Use of skin-cancer prevention strategies among farmers and their spouses. Am J Prev Med. 1995; 11(5):342-7.
13. Singh G, Pandey N. Role and impact of media on society: A sociological approach with respect to demonetisation. IMPACT: IJRHAL. 2017:5(10):127-36.
14. Gupta A. Skin cancer concerns in people of color: Risk factors and prevention. Asian Pac J Cancer Prev. 2016;17(12):5257–64.