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Knowledge, Attitudes and Practices on Sunscreen Usage in Preventing Skin Cancer among University Students

(Pengetahuan, Sikap dan Amalan mengenai Penggunaan Pelindung Matahari dalam Mencegah Kanser Kulit Di Kalangan Pelajar UKM)

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ABSTRACT

Solar ultraviolet radiation is one of predisposing risk factors for skin cancer. The use of sunscreen plays a vital role in the prevention of skin cancer. A cross-sectional study was conducted to evaluate the knowledge, attitudes and practices related to sunscreen use in the prevention of skin cancer among undergraduate students of Universiti Kebangsaan Malaysia (n=78) in the Faculty of Health Sciences (FSK), Faculty of Engineering and Built Environment (FKAB) and Faculty of Social Sciences & Humanity (FSSK). Majority of the students used sunscreen. The mean level of knowledge for FSSK students was the highest compared to FSK and FKAB students. Next, the mean level of attitude for FSSK students was higher than the FSK and FKAB students. Meanwhile, there was a significant difference ($p<0.05$) in attitude between FSSK and FKAB students. FSSK students demonstrated highest mean level of practice compared to FSK and FKAB students. Finally, FKAB recorded the lowest number of students with high knowledge and the usage of sunscreen with statistical significance ($p<0.05$) between the level of knowledge and the use of sunscreen. This indicates that there was a linear association between level of knowledge and the use of sunscreen among FKAB students. In conclusion, knowledge, attitudes and practice were generally satisfactory among UKM students. However, periodic awareness could be applied to instill a healthy habit of using sunscreen in future.

Keywords: attitudes; practices; knowledges; skin cancer; sunscreen

ABSTRAK

Sinaran ultralembayung solar adalah salah satu faktor risiko penyebab barah kulit. Penggunaan pelindung matahari memainkan peranan penting dalam pencegahan barah kulit. Satu kajian keratan rentas dilakukan untuk menilai pengetahuan, sikap dan amalan yang berkaitan dengan penggunaan pelindung matahari dalam pencegahan barah kulit di kalangan pelajar prasiswazah Universiti Kebangsaan Malaysia (n = 78) di Fakulti Sains Kesihatan (FSK), Fakulti Kejuruteraan dan Alam Bina (FKAB) dan Fakulti Sains Sosial & Kemanusiaan (FSSK). Keputusan mendapati majoriti pelajar menggunakan pelindung matahari. Tahap pengetahuan pelajar FSSK adalah yang tertinggi berbanding pelajar FSK dan FKAB. Seterusnya, sikap pelajar FSSK adalah lebih tinggi berbanding pelajar FSK dan FKAB. Sementara itu, terdapat perbezaan sikap yang signifikan ($p <0.05$) antara pelajar FSSK dan FKAB. Pelajar FSSK menunjukkan tahap amalan tertinggi berbanding pelajar FSK dan FKAB. FKAB mencatatkan jumlah pelajar yang rendah dengan pengetahuan tinggi dan penggunaan pelindung matahari yang signifikan ($p <0.05$) antara tahap pengetahuan dan penggunaan pelindung matahari. Ini menunjukkan bahawa terdapat hubungan linear antara tahap pengetahuan dan penggunaan pelindung matahari di kalangan pelajar FKAB. Kesimpulannya, pengetahuan, sikap dan amalan adalah memuaskan di kalangan pelajar UKM. Aktiviti bagi memupuk kesedaran dapat dijalankan secara berkala untuk menanam tabiat baik penggunaan pelindung matahari di masa hadapan.

Kata kunci: amalan; kanser kulit; pelindung matahari; pengetahuan; sikap

INTRODUCTION

Humans are exposed to sunlight most of the time in their daily lives. Even though sunlight has a health benefits to the body, however excessive and unprotected exposure to sunlight may be associated with the development of skin cancer. According to the National Cancer Institute, the rate of new cases of melanoma among American adults has tripled since the 1970s, from 7.9 per 100,000 people in 1975 to 22.6 per 100,000 in 2017 (NCI, 2020). Meanwhile, according to Malaysia's Third National Registry Report, skin cancer accounts for 2.6% of all cancer cases in the country (IKN, 2020). Although the exact cause of melanoma is still unknown, scientists have determined that risk factors include family history, indoor tanning, fair skin, freckles, moles, solar ultraviolet (UV) radiation and severe sunburns (CDC 2020). One of the factors that could contribute to this is exposure to UV light hence the use of UV protection was recommended to prevent the individual from getting skin cancer.

The solar UV radiation can penetrate deep into the skin tissue and produce free radicals that can damage skin's cells and age the skin which then lead to skin cancer. Approximately 80% of cases of skin cancer are preventable with sun protection measures and appropriate behavior (Al-Naggar, 2013). Sunscreen includes any treatment (such as creams, oils, gels, sprays) that is intended to be used in contact with human skin or as primary purpose of protecting it from solar UV radiation by consuming, dispersing, or reflecting sunlight. Thus, sunscreen plays a vital role in the prevention of skin cancer as it provides barriers against DNA damage and illness by inhibiting the transmission of UV radiation to the skin by reflecting, absorbing, or scattering such radiation (Khamsiah et al., 2012; Rozaini et al., 2017). Consequently, sunscreens have been recommended as a form of protection against sunlight with a higher sun protection factor (Al-Robaee, 2010).

Malaysia is a tropical climate country with a temperature range of 25-35°C throughout the year. The rising average surface temperature in Malaysia is very evident and will affect the routine of Malaysians (Al-Robaee, 2010). Young adults are particularly vulnerable to sunlight due to the esthetic value of tanning and other activities. Youths usually may be exposed to these sunlight due to their active lifestyle which include outdoor physical activity such as recreation, games, and sports. Thus, to evaluate the youth knowledge, attitudes and practices on this issue, a study was conducted among students at Universiti Kebangsaan Malaysia (UKM).

RESEARCH METHODOLOGY

Cross-sectional studies conducted among students of UKM. The target population was undergraduate students from the Faculty of Health Sciences (FSK), Faculty of Engineering and Built Environment (FKAB) and Faculty of Social Sciences and Humanity (FSSK) during the academic year of 2019/2020. FSK is a faculty with a health science background, in the other hand, FKAB with a science background and lastly FSSK with a social science background. A total of 78 students were selected based on sample size calculation by using formula $n_{\circ} = [(Z\alpha/2)\ ^2p\ (1\text{-}p)]/\Delta^2$. Thus, 26 students for each faculty were chosen for this research. All subjects have given their informed consent to be participated in the study.

Research data were obtained through a validated questionnaire that was developed from previous studies (Al-Naggar, 2018; Al-Naggar & Bobryshev, 2012; Awadh et al., 2016). The questionnaire consisted of 26 questions with 4 parts: A) socio-demographic, B) knowledge of sunscreen usage, C) attitude of sunscreen usage and D) practices of sunscreen usage. The inclusion criteria were undergraduate students UKM from FSK, FKAB and FSSK in year of 2019/2020. UKM students who have chronic illness or sensitive to ultraviolet rays were excluded from this study.

Scoring system was implemented in this study as indicated. For part B (knowledge), scoring system was conducted for each answer given (no = 0; not sure = 0.5; yes = 1). For part C (attitude), scoring marks used are as follows: strongly disagree =1; disagree = 2; not sure = 3; agree = 4, strongly agree = 5). For part D (practices), the scoring was mainly divided into no = 0 and yes = 1. Data obtained were analyzed using SPSS software version 20.0. ANOVA was used to compare the level of knowledge, to determine the difference level of attitude and to compare the level of practices on sunscreen usage between the faculties. Pearson's Chi square test was used to determine the relationship between knowledge and usage of sunscreen by faculty. All test was analyzed with confidence interval, α=0.05, with $p<0.05$ as the level of significance.

RESULTS

Sociodemographic Data

Most of the students were female (79.5%) and Malay (65.4%). FSSK recorded the highest sunscreen user usage (29.5%), followed by FSK (25.6%) and FKAB (19.2%) (Table 1).

TABLE 1. Sociodemographic data of the students

		Frequency (n)	Percentage (%)
Gender	Male	12	20.5
	Female	62	79.5
Race	Malay	51	65.4
	Chinese	12	15.4
	Indian	13	16.7
	Others	2	2.5
Faculty	FSK	26	33.3
	FSSK	26	33.3
	FKAB	26	33.3
Sunscreen Usage	FSK	20	25.6
	FSSK	23	29.5
	FKAB	15	19.2

Score of Knowledge on Sunscreen Usage in Preventing Skin Cancer Among Faculty

Based on the questions on general knowledge of skin cancer and sunscreen usage (Supplement 1) Figure 1 shows the mean score of knowledge on sunscreen usage among FSK, FSSK and FKAB students. The mean score of knowledge of FSSK students was highest (8.73 ± 0.32). The mean score of knowledge of FSK students was 8.46 ± 0.43 which was lower than FSSK students but higher than FKAB (8.04 ± 0.39). The higher score of knowledge indicates that the students have higher knowledge about sunscreen usage in preventing skin cancer.

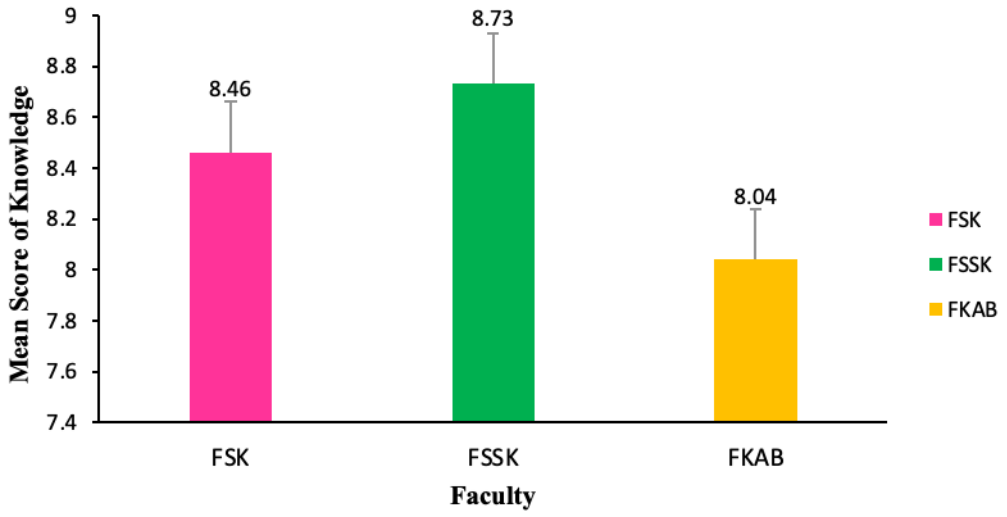

FIGURE 1. Comparison of mean score of knowledge on sunscreen usage in preventing skin cancer among Faculty of Health Sciences (FSK), Faculty of Engineering and Built Environment (FKAB) and Faculty of Social Science and Humanity (FSSK) students.

Score of Attitude on Sunscreen Usage in Preventing Skin Cancer Among Faculty

Based on the questions to identify respondents' attitudes on sunscreen usage (Supplement 2) Figure 2 showed the comparison of the mean score of attitudes on sunscreen usage between FSK, FSSK and FKAB students. The mean score of attitudes for FSSK was the highest (33.50 ± 0.80), followed by FSK (32.29 ± 0.79) and FKAB (30.38 ± 1.05). The higher score for attitude indicates that the students have positive attitude towards the sunscreen usage. ANOVA was conducted to compare the level of attitude on sunscreen usage between the faculty. There was a significant difference in level of attitude ($p=0.037$, $p<0.05$) for FSSK and FKAB students.

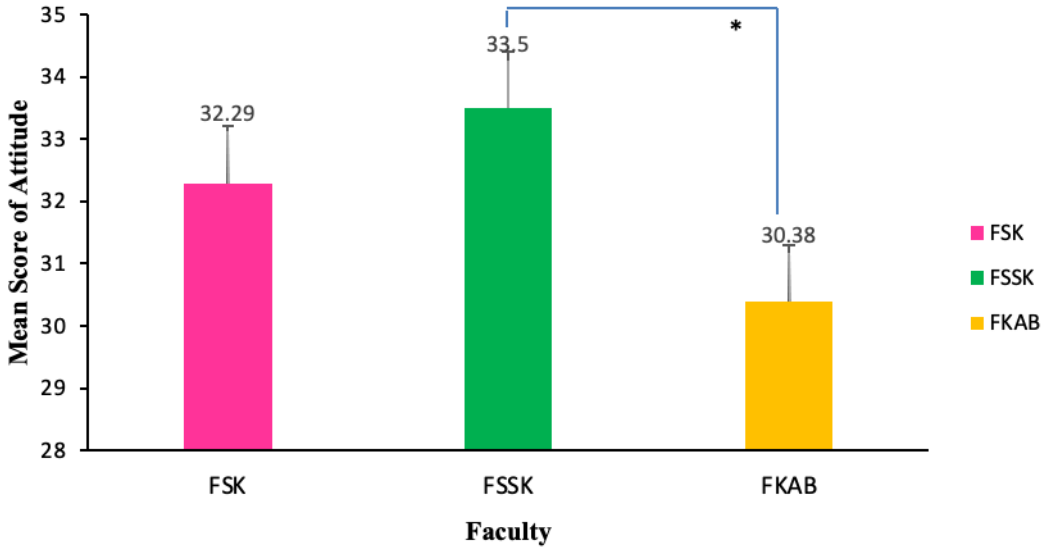

FIGURE 2. Comparison of mean score of attitudes on sunscreen usage between Faculty of Health Sciences (FSK), Faculty of Engineering and Built Environment (FKAB) and Faculty of Social Science and Humanity (FSSK) students. * ($p<0.05$) post hoc Tukey test.

Score of Practices on Sunscreen Usage in Preventing Skin Cancer Among Faculty

Based on the questions to identify respondents' practices on sunscreen usage (Supplement 3) Figure 3 showed the comparison of mean score of practices between FSK, FSSK and FKAB student. From the graph, FSSK (4.53 ± 0.39) recorded the highest mean practice score compared to FSK (4.53 ± 0.39) and FKAB (1.97 ± 0.47). While FKAB recorded the lowest mean practice score between FSSK and FSK. The higher mean score means the better level of practices on sunscreen usage. ANOVA test showed there was a significant difference in practice score between FSSK and FKAB ($p<0.05$). There was also a significant difference between FSK and FKAB ($p<0.05$).

Association between Knowledge and Sunscreen Usage Among Faculty

A Pearson's Chi Square was used to correlate the knowledge and usage of sunscreen among faculty. In Table 2, 21 students in FSSK have high knowledge on the sunscreen usage with daily application. In FSK, 18 students have high knowledge about sunscreen usage with daily application. Meanwhile, in FKAB there were 13 out of 26 students who have high knowledge about sunscreen usage with daily application. There was statistically significant ($p<0.05$) between level of knowledge and usage of sunscreen in FKAB. It indicates that there was a linear association between level of knowledge and usage of sunscreen in FKAB, but there was no linear association between level of knowledge and usage of sunscreen in FSK and FSSK.

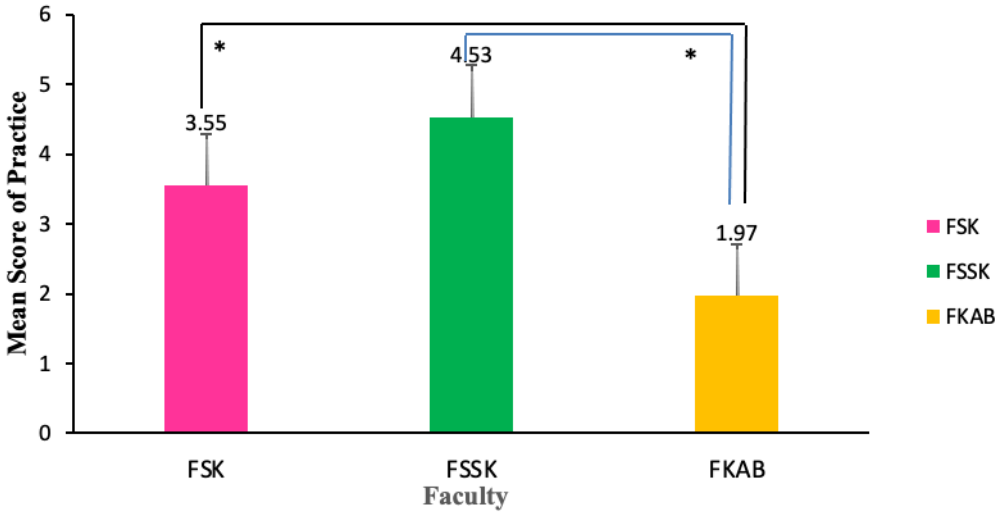

FIGURE 3. Comparison of mean score of practice on sunscreen usage between Faculty of Health Sciences (FSK), Faculty of Engineering and Built Environment (FKAB) and Faculty of Social Science and Humanity (FSSK) students. * ($p<0.05$) post hoc Tukey test.

TABLE 2. Relationship of knowledge and sunscreen usage between Faculty of Health Sciences (FSK), Faculty of Engineering and Built Environment (FKAB) and Faculty of Social Science and Humanity (FSSK) students

Faculty	Knowledge	Usage of	Sunscreen	χ^2	p-value
		Yes	No		
FSK	Poor	3	1	0.101	0.750
	High	18	4		
FSSK	Poor	2	1	1.469	0.225
	High	21	2		
FKAB	Poor	1	6	6.032	0.014*
	High	13	6		

*Indicates there was a significant association ($p<0.05$).

DISCUSSION

Public awareness of the use of sunscreen is important, as sunscreen is the simplest and most convenient method that could be applied to protect against UV. Previous studies have shown the need to increase public awareness among society about protection against sun exposure and skin cancer (AlGhamdi et al., 2016; Stephens et al., 2018). As young people are physically active, they may be at high risk of UV exposure. This is important as preventive strategies for this age group could be implemented, if necessary. Thus, to evaluate their knowledge, attitude and practice, this study was conducted among undergraduate students of different study backgrounds.

University students may participate in variety of activities such as sports and recreational, as they are active youth. Majority of the students were sunscreen users who indicated they were aware of the sunscreen function. Sunscreen products are popular among

female students as they are more concerned about their appearance, cosmetic awareness, image-consciousness and appearance-focused than men (Tilwani et al., 208; Memon et al., 2019). As the knowledge scores were equally significant between the faculty, this could be contributed by the education level among the students. Education is an important factor as knowledge leads to a better attitude and behavior toward the sunscreen use. Previous study demonstrated that pharmacy and medical students were aware of damaging effects of UV radiation and more accepting in suncreen usage to prevent the negative effect (Awadh et al., 2016). Previous study has shown that the high prevalence of sunscreen use among the university students can be explained by the fact that the university teaches health sciences (AlJasser et al., 2020). Education improves their knowledge and makes them more aware about the consequences of not applying sunscreen (Geller et al., 2003). In addition, social media plays role in advertising sunscreen products and its benefits to users that influence students' knowledge.

FSSK demonstrated the highest level of attitude followed by FSK and FKAB. According to the previous research, pharmacy students had a higher usage of sunscreen compared to medical undergraduates who may have contributed by their syllabus that focusing on sunscreen topic (Awadh et al., 2016). However, this was inconsistent with our result as FSSK undergraduates with social science and humanities background demonstrated the highest attitude level towards sunscreen use instead of FSK students with health care background. Involvement of outdoor activities for data collection or fieldwork such as geography subject might make them to be more aware of the consequences of not applying sunscreen during outdoor activities.

Based on the research carried out by Al Robaee et al., the rate of sunscreen use was low in Saudi adult populations despite relatively good knowledge among participants that exposure to sunscreen and sunburns predispose to skin cancer (Al-Robaee, 2010). It was concluded that knowledge itself was often insufficient to sustain a change of attitude and behavior. Realizing this, practices score was collected and it was found that there was a clear association between the knowledge, attitudes and practices of undergraduate students from FSSK, FSK and FKAB regarding the importance of sunscreen use in reducing risk of skin cancer. FSSK undergraduates with the highest level of knowledge and attitude had the highest level of practice, followed by FSK and FKAB. This demonstrated that level of knowledge on importance of sunscreen had a significant impact on the undergraduates' level of attitude and eventually led to a change in their use of sunscreen. This is in accordance with previous study that stated graduates or professionals were more likely to use sunscreen because they were more aware of the protective effects of sunscreen on cancer compared to those who were primary or high school students (Agarwal et al., 2018).

The final objective of this study is to determine the relationship between the faculty's knowledge and use of sunscreen. The result showed a significant difference ($p \leq 0.05$) between sunscreen use and students from FKAB indicating there was strong evidence that the FKAB students had slightly low attitudes and practices in sunscreen use compared to FSK and FSSK students. This may be due to the lowest level of knowledge and practices in the use of sunscreen as protection against skin cancer among the FKAB students in UKM. However, FSSK which has the highest score for each knowledge and practices of sunscreen, has shown a high level of awareness on the role of sunscreen in the prevention of skin cancer. These were good indicators compared previous study that demonstrated low sunscreen usage despite good knowledge on the negative effects of UV radiation that highlight the needs of awareness program (Al-Robaee et al., 2010). From the results, activities that emphasize on sunscreen usage against solar ultraviolet radiation could therefore be planned among students as a good habit.

CONCLUSIONS

The knowledge, attitudes and practices sunscreen usage in preventing skin cancer among UKM students were satisfactory. Constant awareness activities could be conducted to instill a good habit of using sunscreen among the students in future.

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SUPPLEMENT 1. Questions on knowledge of skin cancer an sunscreen usage in all groups of university students.

Questions		Health Science (FSK), n(%)	Engineering and Built Environment (FKAB), n(%)	Social Science and Humanities (FSSK), n(%)
Sunscreen is effective at preventing skin cancer.	Yes = 1	19 (73)	18 (69)	17 (65)
	Not sure = 0.5	5 (19)	8 (31)	9 (35)
	No = 0	2 (8)	0 (0)	0 (0)
Sunscreen is effective at preventing signs of aging.	Yes = 1	19 (73)	15 (58)	16 (2)
	Not sure = 0.5	4 (15)	10 (38)	10 (38)
	No = 0	3 (12)	1 (4)	0 (0)
Sunscreen provides better protection when the SPF is higher.	Yes = 1	14 (54)	17 (65)	20 (77)
	Not sure = 0.5	8 (31)	8 (31)	4 (15)
	No = 0	4 (15)	1 (4)	2 (8)
UVA has more risk of causing skin cancer.	Yes = 0	12 (46)	8 (31)	9 (35)
	Not sure = 0.5	12 (46)	17 (65)	14 (54)
	No = 1	2 (8)	1 (4)	3 (12)
UVB has more risk of causing skin cancer.	Yes = 1	12 (46)	6 (23)	6 (23)
	Not sure = 0.5	11 (42)	16 (62)	2 (8)
	No = 0	3 (12)	4 (15)	18 (69)
Do you aware that your cosmetics or sunscreen have SPF?	Yes = 1	24 (92)	17 (65)	23 (88)
	Not sure = 0.5	1 (4)	2 (8)	2 (8)
	No = 0	1 (4)	7 (27)	1 (4)

SUPPLEMENT 2. Questions on attitudes of sunscreen usage on all groups of university students.

Questions		Health Science (FSK), n(%)	Engineering and Built Environment (FKAB), n(%)	Social Science and Humanities (FSSK), n(%)
Applying sunscreen is a good practice.	Strongly disagree = 1	0	0	0
	Disagree = 2	0	0	0
	Not sure = 3	2 (8)	6 (23)	2 (8)
	Agree = 4	10 (38)	5 (19)	3 (12)
	Strongly agree = 5	14 (54)	15 (58)	21 (81)
Primary intention of applying sunscreen is for appearance enhancement.	Strongly disagree = 1	1 (4)	1 (4)	1 (4)
	Disagree = 2	5 (19)	2 (8)	2 (8)
	Not sure = 3	7 (27)	8 (31)	5 (19)
	Agree = 4	7 (27)	10 (38)	13 (50)
	Strongly agree = 5	6 (23)	5 (19)	5(19)

Putting sunscreen on has more trouble than its benefits.	Strongly disagree = 5	7 (27)	4 (15)	16 (62)
	Disagree = 4	11 (42)	13 (50)	7 (27)
	Not sure = 3	4 (15)	6 (23)	2 (8)
	Agree = 2	3 (12)	2 (8)	-
	Strongly agree = 1	1 (4)	1 (4)	1 (4)
Is your practice of applying sunscreen mediated by sunscreen intention?	Strongly disagree = 1	0	3 (12)	0
	Disagree = 2	1 (4)	0	0
	Not sure = 3	7 (27)	9 (35)	8 (31)
	Agree = 4	13 (50)	10 (38)	11 (42)
	Strongly agree = 5	5 (19)	4 (15)	7 (27)
You will recommend sunscreen to your circumstances.	Strongly disagree = 1	0	0	0
	Disagree = 2	1 (4)	4 (15)	0
	Not sure = 3	5 (19)	3 (12)	3 (12)
	Agree = 4	11 (42)	13 (50)	6 (23)
	Strongly agree = 5	9 (35)	6 (23)	17 (65)
Are you aware of the benefits of sunscreen in preventing skin cancer	Strongly not aware = 1	1 (4)	2 (8)	0
	Not aware = 2	0	2 (8)	3 (12)
	Not sure = 3	2 (8)	5 (19)	4 (15)
	Aware= 4	14 (54)	6 (23)	6 (23)
	Strongly aware = 5	9	11 (42)	13 (50)
Perceptions of friends and family members about your engagement in skin protection.	Strongly not supporting = 1	0	0	0
	Not supporting = 2	1 (4)	0	0
	Not sure = 3	9 (35)	10 (38)	10 (38)
	Supporting = 4	10 (38)	9 (35)	7 (27)
	Strongly supporting = 5	6 (23)	7 (27)	9 (35)
How motivated are/ were you to comply with your friends and family members opinions?	Strongly demotivated = 1	0	0	0
	Demotivated = 2	0	1 (4)	2 (8)
	Not sure = 3	7 (27)	10 (38)	5 (19)
	Motivated = 4	14 (54)	9 (35)	9 (35)
	Strongly motivated = 5	5 (19)	6 (23)	10 (38)

SUPPLEMENT 3. Questions on practice of sunscreen usage on all groups of university students.

Questions		Health Science (FSK), n(%)	Engineering and Built Environment (FKAB), n(%)	Social Science and Humanities (FSSK), n(%)
Do you apply sunscreen?	Yes =1	21 (81)	11 (42)	23 (88)
	No =0	5 (19)	15 (58)	3 (12)

Do you apply sunscreen during outdoor activities?	Yes =1	19 (73)	10 (38)	23 (88)
	No =0	1 (4)	0	0
	Maybe =0.5	1 (4)	1 (4)	0
Do you apply sunscreen during indoors?	Yes =1	5 (19)	3 (12)	8 (31)
	No =0	13 (50)	6 (23)	9 (35)
	Maybe =0.5	3 (12)	2 (8)	6 (23)
Does your sunscreen provide protection from UVA and UVB rays?	Yes =1	18 (69)	8 (31)	18 (69)
	Maybe =0	3 (12)	3 (12)	5 (19)
Where do you typically apply sunscreen?	Face =0	13 (50)	5 (19)	11 (42)
	Face, Neck, Hands =0.5	6 (23)	6 (23)	8 (31)
	All exposed areas =1	2 (8)	0	4 (12)
How much sunscreen do you typically apply?	Tablespoon or less =0.5	7 (27)	7 (27)	8 (31)
	Quick dab/ Spray =0	10 (38)	4 (15)	7 (27)
	Palmful =1	4 (15)	0	8 (31)
How often do you reapply sunscreen to yourself?	After water exposure =0.5	10 (38)	3 (12)	9 (35)
	Do not reapply =0	9 (35)	3 (12)	5 (19)
	Every few hours =1	2 (8)	5 (19)	9 (35)
Do you wear the following protective clothing?	None =0	13 (50)	6 (23)	11
	Clothes with universal protection =0.75	5 (19)	0	5 (19)
	Sunglasses with UV protection =0.25	0	3 (12)	6 (23)
	Hat 0.5	2 (8)	1 (4)	1 (4)
	All of above =1	1 (4)	1 (4)	0