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Knowledge, attitudes and practices of the general public toward the harmful effects of sun exposure and protection

Shimaa Samy Abd El-Hady Hammad

MBBCh, Resident of Dermatology, Andrology And Venerology department at Sadat City University, medical department, Menoufia
Corresponding author email: drshimaahammad@gmail.com

Mohamed Abdelwahed Gaber

MD, Professor and head of Dermatology, Andrology & STDs Department, Faculty of Medicine, Menoufia University
Email: ma_wahed2012@hotmail.com

Abstract---Background; Excessive unprotected sun exposure is a significant risk factor for skin damage and skin cancers. In recent decades, the incidence of skin cancer has increased dramatically worldwide, reaching epidemic proportions. Sun protection is a key primary preventive strategy against skin cancer and skin damage induced by sun exposure. Aim and objectives; was to determine the knowledge, attitudes and behaviors of individuals on the harmful effects of the sun and protection ways. Subjects and methods; this study was a cross-sectional study conducted on 104 males and 316 females who attended Menoufia university dermatology clinic and some of the employments (physicians , nurses and officers)in the Menoufia university hospitals and some of the students. Result; the mean age of the studied participant was 31.30 ± 7.55 and the majority of them were females (75.2%). There were significant bad sun habits and lower sun protection behavior (indicated by increasing SEPI part I score which was 10.22 ± 3.63). Also, there was significant decreasing propensity to increase sun protection (indicated by increasing SEPI score part II) in males than females, unmarried than married persons, with low levels of education in the studied participants. About 94.3% of the participants were aware about sun light help in the synthesis of vitamin D and 88.8% of them were aware that one of the harmful effects of sunlight exposure is hyperpigmentation. Moreover, 37.1% of the participants reported that sun exposure increases skin aging and causing skin cancer (43.8%). Regarding sun screen creams, 42.6% of the studied participants reported that >30 SPF sunscreen was enough for sun protection in the summer and 61.7% believed that sunscreen

is applied on the face only. The appropriate time for use of sunscreen product was correctly answered by only 36.7% of them and 76.9 % thought that applying sunscreens was in the summer only. In addition, 74.3% believed that child does not need to apply sunscreen. Conclusion: This study has shown that sun exposure awareness and protection are generally inadequate in the participants and suggests the need for health education programs about the harm effects of the sun exposure and the ways of protection.

Keywords---knowledge, attitude, practices, sun-protection, sun exposure, sunscreen.

Introduction

Excessive unprotected sun exposure has been shown to cause skin damage as well as many skin diseases [1]. As a result of short-term exposure to ultraviolet (UV) radiation, human skin could suffer from acute damage, including burning and tanning. Furthermore, long-term UV exposure may result in chronic skin diseases, such as hyperpigmentation (e.g., ephelides, and melasma), skin aging (e.g., telangiectasias and elastosis), and skin cancer [2]. The harmful effects of sun radiation are stated widely in the international literature. The climatologically conditions, mainly the ozone depletion in the earth atmosphere, allows ultraviolet sun radiation to penetrate into the skin, increasing the risk for serious health problems such as skin cancer [3].

The incidence of skin cancer has increased dramatically worldwide in the last decade [4] establishing the 3 main types of skin cancer—malignant melanoma, squamous cell cancer, and basal cell cancer—as significant public health concerns [4]. Squamous cell cancer risk increases with high levels of cumulative sun exposure, and malignant melanoma and basal cell cancer risk factors include a history of severe sunburn and intense intermittent exposure to the sun at an early age. [5] However, the understanding of risk from UVR exposure is not consistent among all individuals, and there is a belief by some dark-skinned individuals that photoprotection is not essential, it is clear that more specific guidance and education about photoprotection are needed. So the purpose of this work is to highlight the distinctive aspects of photoprotection practice. [6]

Methods

This was a cross-sectional study conducted on both males and females (n=420) who attended Menoufia university dermatology clinic and some of the employments (physicians, nurses and officers)in the university hospitals and some of the students. during the period ffrom May 2020 to August 2020 Data collection was performed by the author, the specially designed questionnaire required approximately 5 min to complete by the researcher from the participants. The eligible subjects included in this study were subjected to three questionnaires included personal data questionnaire, Exposure Protection Index (SEPI) questionnaire and questionnaire for knowledge, attitude, and behaviors. Personal data included age, sex, marital status, education levels and occupation. The SEPI scoring questionnaire consists of two parts. one including eight

questions appraising sun habits and sun protection behavior, and one including five questions assessing readiness to increase sun protection. The contents of the two sections were developed from previous studies [7]. Part I mapping sun exposure/protection habits, includes eight questions based on five-grade Likert scale scores (0–4 points), resulting in a total score of 0–32 points, reflecting an increasing risk exposure. Part II, mapping readiness to increase sun protection, includes five questions scored from 0 to 4 points, resulting in a total score of 0–20 points, reflecting a decreasing propensity to increase sun protection. Thus, in summary, a high score in both parts reflects a high level of sun exposure, and a low propensity to change it [8].

The questionnaire of knowledge level, attitude level, and behaviors of the participants was constructed and validated by the authors after reviewing the literatures. It consisted of questions that assessed participant's knowledge of benefits and harmful effects of sunlight, source of information, preferred method of sun protection, and required sun protection factor (SPF) and the attitude of respondents toward the use of sunscreen.

Inclusion Criteria for study group: Participants who agreed to participate and Age was 12–60 years.

Exclusion Criteria for groups: Participants who refused to participate, participants who failed to complete the questionnaires and individuals with limited autonomy or impaired cognitive abilities.

Ethical Consideration: Study protocol had been submitted for approval by Institutional Review Board, University. Informed verbal consent had been obtained from each participant sharing in the study. Confidentiality and personal privacy had been respected in all levels of the study.

Data management and Statistical Analysis: Data collected entered and analyzed using Microsoft Excel software. Data were then imported into Statistical Package for the Social Sciences (SPSS version 20.0). According to the type of data qualitative represent as number and percentage, quantitative continues group represent by mean $\pm$ SD.

Analytical statistics: Student's t-test used for comparison between two groups having quantitative variables. ANOVA test was used to assess the statistical significance difference of quantitative variable between more than two study groups. Kruskal-Wallis test was used to assess the statistical significance of the difference of a non-parametric variable between more than two study groups. Pearson's correlation was used to assess association between two quantitative variables. Statistical significance was defined as a p-value <0.05 .

Results

Table (1) shows the distribution of participants who contribute in the present study according to some sociodemographic characteristics, their mean age was 31.30 ± 7.55 years and ranged from 12–60 years. the majority of them (75.2%) were female, 60.7% were married. Regarding education level, 88.5% graduated from university and only 3.1% of them had basic education. 270 (64.2%) had office jobs, 19.8% were students, 13.1% had field jobs and 2.9% were homemaker. Table (2) shows that most participants (81.1%) never do sunbathe with the intention to get tanned. 35.5% of them suffered from sunburnt (redness

and smarting during the last 12 months 1-2 times. More than half of participants (51.2%) usually stay in the sun 30 minute (on average) between 11 am and 3 pm, on a typical day-off. 40.5% were seldom take a holiday with the intention of spending more time in the sun. 27.9% reported that they never use sunscreens when exposed to sun while 27.1% were seldom using covering clothes for sun protection. 23.3% of participants often use a sun hat or cap for sun protection. 44% of them often stay indoors or in the shade in order to protect themselves from the sun .

Table (3) shows that 89% of the participants reported that they avoided sunbathing for a long time (89%) while 31.9% of them used sunscreens for a long time. More than third participants (38.1%) never thought of using covering clothes for sun protection and 25.2% never thought of using a sun hat or cap for sun protection. More than half cases (59.5%) tried to stay in the shade during the hours of strongest sun light for a long time. The mean total SEPI part I score was 10.22 ± 3.63 while the mean total SEPI part II score 7.67 ± 4.09 as shown in table (4).

There was significant decreasing propensity to increase sun protection (indicated by increasing SEPI part II score) in males than females ($p < 0.001$), unmarried than married persons ($p = 0.032$), with lower levels of education ($p = 0.004$) and in field/outdoor work in the studied participants ($p = 0.028$) as shown in table (5). Table (6) illustrates that the majority of respondents (89%) don't use umbrella in the sunny days. 48.8% reported that they always wear sunglasses in the sunny days. 94.3% were aware that sun lights help in synthesis of vitamin D and 88.8% of them also aware that one harms of sunlight exposure is hyperpigmentation and 66.4% were aware that one of the harmful effects of the sun is sunburn. 69.3% thought that light skinned people more liable to skin damage caused by sunlight and 89.8% thought that those who work in the desert, fields, and construction work more harmed by sunlight. 66.9% of respondents did not prefer sitting in the winter sun for long periods of times.

Table (7) shows data on sunscreen knowledge and use among our respondents. 42.6% reported that >30 SPF sunscreen was enough for sun protection in the summer and 61.7% believed apply sunscreen on face only. 45.5% reported that brand name was their priorities I in selection of a sunscreen product. only 36.7% of them were aware of the appropriate time for use of sunscreen product. 30.7% were aware of the necessity of reapplying sunscreen once in 2-3 hours. 76.9 % responders thought that applying sunscreens was in the summer only. 74.3% of them believed that child does not need to apply sunscreen.

Discussion

This questionnaire study aimed to determine the knowledge, attitudes and behaviors of individuals toward the harmful effects of the sun and protection ways. In our study female were more than males with 75.2% of population. Most were educated at universities. Indoor jobs were 64.2% of population then outdoor jobs with 13.1%. A similar study [9] total of 802 persons were interviewed. 43.5% of the participants were males and 56.5% females. The median age was 42 years,

whereas the majority of subjects were (83%) reported a having a darker skin phototype III/IV

The highest percentages of participants' responses were never performed sunbathe with the intention to get tanned (81.1%), did not have sunburn in the last 12 months were (49.8%), usually stay in the sun (on average) between 11 am and 3 pm, on a typical day-off for < 30 min were (51.2%) , seldom take a holiday with the intention of spending more time in the sun (40.5%), never use sunscreens when was in the sun were (27.9%), seldom use covering clothes for sun protection when was in the sun were (27.1%), never use a sun hat or cap for sun protection when was in the sun (24.8%), often stay indoors or in the shade in order to protect himself from the sun were (44.0%).

Similar to our analysis Nikolaou et al., [10] study showed that the vast majority of responders were (77.1%) used sunscreens in order to avoid sunburns and of those, only a small fraction were (8.2%) apply products with SPF. Studies from northern European countries as well as the United States show a higher proportion of people who use low SPF [11]. The prolonged sunny period in our Mediterranean climate has probably strengthened the use of sunscreens in our population compared with populations living in higher latitudes. In agreement with other studies, the participants of our study were well aware of the association of sun exposure with skin burns and skin aging. Less positive answers were given for sunburns during childhood, a risk factor that has been incriminated for the development of skin burns. Whether this lack of knowledge reflects a lack of applying sun-protection measures in childhood population should be further investigated.

Also in [8] Almost one-third of the study participants were not aware of the risks related to artificial tanning. The reason for this high proportion may be the fact that in Egypt there is not much information by mass media or organized campaigns on the hazards of tanning devices. Nevertheless, sunbed users in our sample were substantially lower (5%) than that reported from northern and other Mediterranean countries as reported in [12]. However, this low percentage of people may be at an increased risk for skin lesion as they were primarily young persons, with 20% of them spending more than 3 h/day under the sun during summer vacations. Efforts by public health agencies and medical organizations are currently underway attempting to place the use of tanning devices under strict regulations and to prevent their widespread use observed in other European countries.

Similar to our study Sinclair, [13] reported sun protection programmes do not have to compete with the human need for vitamin D; with appropriate refinements of the sun protection message, the two messages can be quite complementary. In terms of key recommendations for going forward, every opportunity should be made to promote the Global UV Index to those responsible for delivering sun protection campaigns to guide when sun protective behaviour should be encouraged as well as when it may not be required. In our study there were significant bad sun habits and lower sun protection behavior (indicated by increasing SEPI part I score) in males than females, unmarried than married

persons, with lower levels of education and in field/outdoor work in the studied participants.

There was significant decreasing propensity to increase sun protection (indicated by increasing SEPI part II score) in males than females, unmarried than married persons, with lower levels of education and in field/outdoor work in the studied participants. Self-reported sunscreen use among outdoor workers ranged from 5.9% of Latino day labourers [14] to 45% of Australian outdoor workers with a mandatory PPE policy [15]. Self-reported sunscreen use among people during leisure activities ranged from 26 to 27% among Australian males [13] to 95% among boat users [16].

Previous studies observing the relationship between self-estimated skin type and sun habits have shown that a sensitive skin type appears to be associated with a higher level of sun avoidance and protection [17]. Also in Widemar & Falk, [8] women reported using sunscreen more frequently than men, which again is in concordance with previous studies [18]. However, women in Widemar & Falk, [8] also reported spending more time tanning and more time in the midday sun, and experiencing a higher number of occasions with sunburn. This could explain why women were more willing to increase their use of sunscreen.

However, in Widemar & Falk, [8] women also reported that they considered sunbathing to be more harmful than beneficial and that they had a higher risk of developing skin lesion than men. This may reflect a plausible tension in the decisional balance between two contradictory sides of the matter: the wish to get tanned skin against the risk of getting sunburnt and a possible heightened risk of developing skin lesion, thus promoting a need for increase in sun protection use. The choice of sunscreen as the preferred protection could possibly reflect that it allows for some tanning of the skin, whereas other kinds of sun protection (such as long-sleeved clothing) prevents tanning to a greater extent.

More on our study Widemar & Falk, [8] reported that the use of SEPI scoring as a measurement variable appears to be an efficient and, according to previous instrument validation [19], reliable method for mapping sun exposure habits, and well applicable to this type of study. It is not unlikely that the high response rate achieved in the study was in part associated with the ease with which the questionnaire could be completed. Also, the construction allows for interpretation of single behaviour items (e.g., sunscreen use), as well as the overall behaviour profile reflected by the total SEPI score.

Along with our results Şenel & Süslü, [20] reported that although a high-level of acceptance of the necessity of sun protection by population was determined by our questionnaire (74.2%), the behavior of the group was shown to be unsatisfactory. The prevalence of sunscreen usage among the adolescents in our study was only 41.8%. This prevalence was lower than that found in similar studies reported from Thailand (72.7%) [21], Australia (66.7%) [22], Italy (78.7%) [23], Brazil (74.3%) [24] and Switzerland (80.6%) [25]. the percentage that they found was higher than that reported in only one study carried out in Singapore (22%) [26]. we found no difference between sexes, although there was a female predominance in sunscreen usage in the literature (27).

Conclusion

This questionnaire study has specified a low level of public awareness about sun exposure dangers and sun protection measures and the results of this study indicated that sun protection measures are generally insufficient and only fraction of our population uses sunscreen during outdoor activities by appropriate way on a regular basis. We should focus on particular population subgroups that have a sun-exposure and less protective behavior, such as young persons and males. Perhaps, more appealing approaches that are more youth sensitive, such as photography or leaflets showing sun damaged skin may be more successful in inducing a more sun protective behavior. Significant differences in age, sex and photo types were observed with regard to sun exposure patterns and sunscreen use. Lifelong prevention habits are most flexible during childhood. kindergarten and schools are perfect locale because of their existing infrastructure to help children attaining the essential healthy behaviors. Sun perception and ideas can be integrated into curriculum and study programs such as home economics, health, physical education and science.

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References

1. McKenzie RL, Liley JB, Björn LO. UV radiation: Balancing risks and benefits. *Photochem Photobiol* 2009; 85(1):88–98.
2. Plensdorf S, Martinez J. Common pigmentation disorders. *Am Fam Physician*. 2009; 79 (2).
3. Fitzpatrick T. Richard J. Wolf K. *Clinical Dermatology*. Greek edition. Athens. 2003; 181-275.
4. American Cancer Society, *Cancer Facts and Figures*. Atlanta, GA American Cancer Society, 2007.
5. Armstrong BK, Krickler A. The epidemiology of UV induced skin cancer. *J Photochem Photobiol B*. 2001; 63(1-3):8-18.
6. Balk SJ. Council on Environmental Health and Section on Dermatology, American Academy of Pediatrics. Technical report ultraviolet radiation: a hazard to children and adolescents. *Pediatrics*. 2011; 127:e791-e871.
7. Rocholl M, Hannappel J, Ludewig M, John S. UV-Induced Skin Cancer Knowledge, Sun Exposure, and Tanning Behavior among University Students: Investigation of an Opportunity Sample of German University Students. *Journal of Skin Cancer*. 2021; 1-12. 10.1155/2021/5558694.
8. Widemar, K., & Falk, M. Sun Exposure and Protection Index (SEPI) and Self-Estimated Sun Sensitivity. *The journal of primary prevention*. 2018; 39(5), 437-451.
9. Jewett, R., Kerr, G., & Tamminen, K. University sport retirement and athlete mental health: A narrative analysis. *Qualitative Research in Sport, Exercise and Health*. 2019; 11(3), 416-433.
10. Nikolaou, V., Stratigos, A. J., Antoniou, C., Sypsa, V., Avgerinou, G., Danopoulou, I., et al. Sun exposure behavior and protection practices in a Mediterranean population: a questionnaire-based study. *Photodermatology, photoimmunology & photomedicine*. 2009; 25(3), 132-137.

11. Barrett, F., Usher, K., Woods, C., & Conway, J. Sun protective behaviours during maximum exposure to ultraviolet radiation when undertaking outdoor activities: An integrated literature review. *Journal of Public Health*. 2019; 27(3), 393-405.
12. Monfrecola, G., Fabbrocini, G., Posteraro, G., & Pini, D. What do young people think about the dangers of sunbathing, skin cancer and sunbeds? A questionnaire survey among Italians. *Photodermatology, photoimmunology & photomedicine*. 2000; 16(1), 15-18.
13. Sinclair, C. Risks and benefits of sun exposure: implications for public health practice based on the Australian experience. *Progress in biophysics and molecular biology*. 2006; 92(1), 173-178.
14. Boyas, J. F., Nahar, V. K., & Brodell, R. T. Skin protection behaviors among young male Latino Day Laborers: An exploratory study using a social cognitive approach. *Dermatology research and practice*, 2016.
15. Woolley, T., Lowe, J., Raasch, B., Glasby, M., & Buettner, P. G. Workplace sun protection policies and employees' sun-related skin damage. *American journal of health behavior*. 2008; 32(2), 201-209.
16. Woolley T, Buettner P. () Similarity of sun protection attitudes and behaviours within North Queensland peer groups. *Health Promot J Austr*. 2009; 20:107–111.
17. Falk, M. Differences in sun exposure habits between self-reported skin type and ultraviolet sensitivity measured by phototest. *Photodermatology, Photoimmunology and Photomedicine*. 2011; 27(4), 190–195.
18. Antonov, D., Hollunder, M., Schliemann, S., & Elsner, P. Ultraviolet exposure and protection behavior in the general population: A structured interview survey. *Dermatology*. 2016; 232(1), 11–16.
19. Falk, M., & Anderson, C. D. Measuring sun exposure habits and sun protection behaviour using a comprehensive scoring instrument—An illustration of a possible model based on Likert scale scorings and on estimation of readiness to increase sun protection. *Cancer Epidemiology*. 2012; 36(4), e265–e269.
20. Şenel, E., & Süslü, I. Knowledge, attitudes, and behaviors regarding sun protection, effects of the sun, and skin cancer among Turkish high school students and teachers. *Dermatologica sinica*. 2015; 33(4), 187-190.
21. Tempark, T., Chatproedprai, S., & Wananukul, S. Attitudes, knowledge, and behaviors of secondary school adolescents regarding protection from sun exposure: a survey in Bangkok, Thailand. *Photodermatology, photoimmunology & photomedicine*. 2012; 28(4), 200-206.
22. Lowe, J. B., Borland, R., Stanton, W. R., Baade, P., White, V., & Balanda, K. P. Sun-safe behaviour among secondary school students in Australia. *Health Education Research*. 2000; 15(3), 271-281.
23. Suppa, M., Cazzaniga, S., Fargnoli, M. C., Naldi, L., & Peris, K. Knowledge, perceptions and behaviours about skin cancer and sun protection among secondary school students from Central Italy. *Journal of the European Academy of Dermatology and Venereology*. 2013; 27(5), 571-579.
24. Dupont, L., & Pereira, D. N. Sun exposure and sun protection habits in high school students from a city south of the country, 2012.
25. Reinau, D., Meier, C., Gerber, N., Hofbauer, G. F., & Surber, C. Sun protective behaviour of primary and secondary school students in North-Western Switzerland. *Swiss medical weekly*. 2012; 142(0708).

26. Nyiri, P. Sun protection in Singapore's schools. *Singapore medical journal*. 2005; 46(9), 471.
27. Suryasa, I. W., Rodríguez-Gámez, M., & Koldoris, T. (2021). Health and treatment of diabetes mellitus. *International Journal of Health Sciences*, 5(1), i-v. <https://doi.org/10.53730/ijhs.v5n1.2864>

Table 1: Demographic data of the studied participants

Demographic data	The studied participants (n=420)	
Age (years)	31.30±7.55	
Mean± SD	31	
Median	12-60	
Range		
Sex:	No	%
Male	104	24.8
Female	316	75.2
Marital status:		
Married	255	60.7
Unmarried	165	39.3
Education levels:		
Basic education	13	3.1
Secondary education	35	8.3
university	272	88.5
Occupation:		
Office job/indoor work	270	64.2
Field job/outdoor work	55	13.1
Students	83	19.8
homemaker	12	2.9

Table 2: Percent distribution of responses to sun habits and sun protection behavior based on SEPI part I in the studied participants

SEPI part I	The studied participants (n=420)	
	No	%
How often do you sunbathe with the intention to get tanned?	401	81.1
• Never	66	15.7
• Seldom	12	2.8
• Occasionally	1	0.
• Often	0	0
• Always		
How many times have you been sunburnt (redness and smarting during the last 12 months?)		
• None	209	49.8
• 1-2 times	149	35.5

• 3-5 times • 6-10 times • More than 10 times	38 8 16	9.0 1.9 3.8
How long do you usually stay in the sun (on average) between 11 am and 3 pm, on a typical day-off? • <30 min • 30 min – 1 hour • 1-2 hours • 2-3 hours • >3 hours	215 116 67 19 3	51.2 27.6 16.0 4.5 0.7
How often do you take a holiday with the intention of spending more time in the sun? • Never • Seldom • 1-2 weeks a year • 3-5 weeks a year • > 5 weeks a year	155 170 81 9 5	36.9 40.5 19.3 2.1 1.2
When in the sun, how often do you use sunscreens? • Always • Often • Occasionally • Seldom • Never	65 93 82 63 117	15.5 22.1 19.5 15.5 27.9
When in the sun, how often do you use covering clothes for sun protection? • Always • Often • Occasionally • Seldom • Never	24 75 105 114 102	5.7 17.9 25.0 27.1 24.3
When in the sun, how often do you use a sun hat or cap for sun protection? • Always • Often • Occasionally • Seldom • Never	58 98 84 76 104	13.8 23.3 20.0 18.1 24.8
How often do you stay indoors or in the shade in order to protect yourself from the sun? • Always • Often • Occasionally • Seldom • Never	168 185 57 5 5	40.0 44.0 13.6 1.2 1.2

Table 3: Percent distribution of responses to readiness to increase sun protection based on SEPI part II in the studied participants

SEPI part II	The studied participants (n=420)	
	No	%
Sunbathing:		
I have never thought of giving up sunbathing.	20	4.8
I could think of giving up sunbathing.	13	3.1
I intend to give up sunbathing.	5	1.2
I have recently given up sunbathing.	8	1.9
I have for a long time avoided sunbathing	374	89.0
Sunscreens:		
I have never thought of using sunscreens.	84	20.0
I could think of using sunscreens.	73	17.4
I intend to start using sunscreens.	47	11.2
I have started to use sunscreens.	82	19.5
I have for a long time used sunscreens	134	31.9
Covering clothes:		
I have never thought of using covering clothes for sun protection.	160	38.1
I could think of using covering clothes for sun protection.	108	25.7
I intend to start using covering clothes for sun protection.	41	9.8
I have started to use covering clothes for sun protection.	44	10.5
I have for a long time used covering clothes for sun protection.	67	16.0
Sun hat or cap:		
I have never thought of using a sun hat or cap for sun protection.	106	25.2
I could think of using a sun hat or cap for sun protection.	92	21.9
I intend to start using a sun hat or cap for sun protection.	54	12.9
I have started to use a sun hat or cap for sun protection.	77	18.3
I have for a long time used a sun hat or cap for sun protection	91	21.7
The shade:		
I have never thought of trying to stay in the shade during the hours of strongest sun light.	9	2.1
I could think of trying to stay in the shade during the hours of strongest sun light.	45	10.7
I intend to start trying to stay in the shade during the hours of strongest sun light.	40	9.5
I have started trying to stay in the shade during the hours of strongest sun light.	76	18.1
I have for a long time tried to stay in the shade during the hours of strongest sun light	250	59.5

Table 4: Total SEPI part I and SEPI part II scores score in the studied participants

Total scores	The studied participants
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	(n=420)		
	Mean $\pm$ SD	Median	Range
SEPI part I	10.22 $\pm$ 3.63	10	0-25
SEPI part II	7.67 $\pm$ 4.09	8	0-20

Table 5: Relationship between readinesses to increase sun protection based on SEPI part II score in the studied participants regarding their demographic data

Demographic data	SEPI part II total score in the studied participants (n=420) Mean $\pm$ SD	Test of significance	p-value
Age (years)	r= -0.058		0.236
Sex: Male Female	9.65 $\pm$ 4.41 7.11 $\pm$ 4.39	U=5.09	<0.001
Marital status: Married Unmarried	7.36 $\pm$ 4.18 8.33 $\pm$ 4.97	U=2.16	0.032
Education levels: Basic education Secondary education university	9.85 $\pm$ 3.26 9.77 $\pm$ 7.30 7.49 $\pm$ 4.15	K=5.64	0.004
Occupation: Office job/indoor work Field job/outdoor work Students homemaker	7.37 $\pm$ 4.18 9.38 $\pm$ 3.67 7.85 $\pm$ 5.88 7.58 $\pm$ 3.55	K=3.07	0.028

r: Pearson correlation coefficient

K: Kruskal-Wallis test

U: Mann-Whitney test

Table 6: knowledge level, level attitude, and behaviors of the participants regarding sun light

Questions	The studied participants (n=420)	
	No	%
Do you use umbrella in the sunny days? • Yes • No	46 374	11.0 89.0
Do you always wear sunglasses in the sunny days? • Yes • No	205 215	48.8 51.2
Knowledge about benefits of sun lights:(what are the benefits of the sunlight?)*		

• synthesis of vitamin D • treatment of some skin conditions • positive pscycological effects • no benefits • I don't know	396 116 231 6 5	94.3 27.6 55.0 1.4 1.2
knowledge about harms of sunlight exposure* • Hyperpigmentations • Increased skin aging • Skin cancer • Sunburn	373 156 184 279	88.8 37.1 43.8 66.4
Who are the people more liable to damage caused by sunlight? • light skinned people • dark skinned people • both are equal in the damage	291 18 111	69.3 4.3 26.4
Who are the people more harmed by sunlight? • those who work in the desert , fields , and construction work • those who do office work • both are equal in harm's	377 11 32	89.8 2.6 7.6
Do you like to sit in the winter sun for long periods of times? • Yes • No If the answer is (yes) do you follow the sun protection measures(wearing sun glasses , hat and applying sunscreens regulary ? Yes No	139 281 23 116	33.1 66.9 5.3 27.6

*there were combined responses so the total no > 420

Table 7: knowledge level, level attitude, and behaviors of the participants regarding sun screen

Questions	The studied participants (n=420)	
	No	%
Knowledge level regarding SPF: How much SPF is enough for sun protection in the summer?		
• <15 SPF	21	5.0
• 15-30 SPF	35	8.3
• >30 SPF	179	42.6
• I do not know	185	44.0

Body parts to be protected from sun exposure according to the participants. What are the parts of the body that you should apply sunscreen on it?		
• Face.	259	61.7
• Face and any body parts exposed to sun.	44	10.5
• I don't use sunscreens	117	27.9
Sunscreen product selection priorities: Which is the most important for you to choose a sunscreen product? *		
• Brand name and price	191	45.5
• SPF value	112	26.7
• Smell	19	4.5
• Fragrance free	43	10.2
• water resistant	38	9.0
• broad spectrum	75	17.9
• I don't know	27	6.4
Sunscreen product usage time (When should you apply the sunscreen for appropriate protection?)		
• An hour ago	37	8.8
• Half an hour ago	154	36.7
• just before exposure to the sun	219	52.1
• After exposure	10	2.4
Knowledge regarding reapplying sunscreens (when you should reapply sunscreen?)		
• Only before exposure	187	44.5
• Once in 2- 3 hours	129	30.7
• In the case of sunburn	73	17.4
Knowledge regarding applying sunscreens (when should you use sunscreens?)*		
• in the summer .	303	72.1
• through the year (summer , winter , spring ,autum)	97	23.1
• I don't use sun screen .	117	27.9
If you have a child older than one year: Do you recommend applying sunscreens to him ?		
• Yes	81	19.3
• No	312	74.3

*there were combined responses so the total no > 420