Skin Cancer Knowledge, Behaviors and Attitudes among Adults in Dermatology & Venereology, Dhaka Medical College and Hospital (DMCH) Dhaka, Bangladesh

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ABSTRACT
Background: Skin cancer is one of the commonest worldwide malignancies and therefore is a global public health problem, it affects people worldwide, particularly, residents of geographic regions where ultraviolet radiation has greater penetration. One of the most preventable malignancies is skin cancer. Nevertheless, there has been a significant increase in the incidence of skin cancer throughout the world in the last few decades. **Objective:** To assess the Skin Cancer Knowledge, Behaviors and Attitudes among Adults in Dermatology & Venereology, Dhaka Medical College and Hospital (DMCH) Dhaka, Bangladesh. **Methods:** Total of 386 questionnaires were delivered and 306 questionnaires were recovered, corresponding to a response rate of 79.3%. 8 of the returned questionnaires were excluded due to incomplete filling. The remaining 298 questionnaires were accepted as valid and used in the final analysis. The self – reported questionnaire form was used to evaluate knowledge, attitudes and behaviors among the survey sample. **Results:** Total of 298 individuals fully completed questionnaires. The median score of knowledge was found to be ten with a total possible score of twenty. Majority of respondents (59.4%) got score less than or equal to ten. All sociodemographic factors and risk factors were analyzed, but the only significant associations were found between age and knowledge score, education level and knowledge score, occupation and knowledge scores. Further there were statistically significant associations between gender, age and sun protective behaviors. **Conclusion:** Level of knowledge about skin cancer, attitude and sun protective behaviors are influenced by several factors including age, gender, educational level and occupation.
Keywords: Sun, Awareness, Melanoma, Sun Protection, Prevention, Sunscreen.

I. INTRODUCTION

Skin cancer is one of the commonest worldwide malignancies and therefore is a global public health problem [1], it affects people worldwide, particularly, residents of geographic regions where ultraviolet radiation has greater penetration [2]. Worldwide skin cancers are divided into two main groups melanoma and non-melanoma skin cancers. Non-melanoma skin cancer includes basal cell carcinoma, which accounts for 70-80% of non-melanoma skin cancer and squamous cell carcinoma accounting for 20% of non- melanoma skin cancer [3]. The incidences of both non- melanoma and melanoma skin cancers have been increasing over the past decades [4]. The risk of developing the condition is related to cumulative sun exposure over a lifetime [5]. Melanoma alone is the 19th most commonly occurring cancer in both sexes worldwide - there were nearly 300,000 new cases in 2018. Non-melanoma skin cancer is the 5th most commonly occurring cancer in men and women, with over 1 million diagnoses worldwide in 2018 [6]. According to Lepiksone J et al. at the end of 2017, skin cancer was the most frequent diagnosis among malignant cancers there were 1693 first time newly diagnosed cases, which confirms, that skin cancer. Major health issue and there is need to evaluate knowledge and attitude of population of regarding

skin cancer, risk factors and sun protection [7].It is very important to understand that skin cancer is mostly preventable with the health care promotion and the early self-detection [8], that's why there is need to find out the knowledge level of the population towards skin cancer's epidemiology, prevention, risk factors and harmful effects of sunlight and decide whether there is need for greater physician and goverment involments in educating the population.

II. MATERIALS AND METHODS
This was a descriptive cross-sectional study was carried out at Dermatology & Venereology, Dhaka Medical College and Hospital (DMCH) Dhaka, Bangladesh from December 2019 -February 2020. Total of 386 questionnaires were delivered and 306 questionnaires were recovered, corresponding to a response rate of 79.3%. 8 of the returned questionnaires were excluded due to incomplete filling. The remaining 298 questionnaires were accepted as valid and used in the final analysis. The only inclusion criterion was age greater than or equal to 18 years. Research was done according to ethical principles, subject to informed consent of the participants, voluntary participation, as well as ensuring the protection and confidentiality of individuals' physical data.

Questionnaire and Data Collection
Study participants were approached on the street. The respondents filled in the questionnaires by themselves. The self – reported questionnaire for data collection was created through a search of relevant literature and had three sections [9-15].
The first section contained sociodemographic data (gender, age, educational level, occupation), self- reported objective risk factors such as personal and family history of skin cancer (defined as one or more affected first-degree relatives) and skin type (Fitzpatrick's skin type classification) [16], which was self-reported using relevant pictures with each skin type description.
The second section contained twenty items which assessed knowledge towards skin cancer's epidemiology, prevention, risk factors and harmful effects of sunlight using yes/no and multiple-choice questions, which was later evaluated over a total of 20 points. Knowledge scores were dichotomized by distributing the study population into low score (0-10 points) and high score (11-20 points) groups. Our established criterion of good knowledge about skin cancer among adults of was more or equal to 60.0% of respondents would have high score.
The third section studied sun protective

attitude and behavior. It consists of six items and two questions. Six items assessed attitude and behavior on harmful effects of sunlight, skin cancer and protection from them using always, seldom and never. First question assessed people's awareness towards monitoring skin for new moles or existing ones changing (yes/no). Second question assessed people's actions when noticing new mole (visit a doctor, ask partner or friend to look at, ignore it, use internet or other sources of information, other).

III. STATISTICAL ANALYSIS:
Analysis of data was done using SPSS (Statistical Package for Social Sciences) for Windows version 21. Continuous data were presented like mean and standard deviation, median and confidence intervals. Categorical data were presented as number and percentage. Pearson Chi-square test and Fisher Exact Probability test were used to determine statistically significant associations of sociodemographics variables (i.e., gender, age, educational level, occupation), personal and first degree relative history of skin cancer, respondents Fitzpatrick skin type with knowledge score. For the analysis, the significance level was set at p-value less than 0.05, with a confidence interval of 95%.

IV. RESULTS
Total 386 questionnaires were delivered and 306 questionnaires were recovered, corresponding to a response rate of 79.3%. 8 of the returned questionnaires were excluded due to incomplete filling. The remaining 298 questionnaires were accepted as valid and used in the final analysis, corresponding to a completion rate of 97.4%. The subjects who participated in the survey were aged between 18-78, with a mean age of 34.5 (SD=14.5). 160 participants (53.7%) were in age group 18-30 and 138 (46.3%) in age group 31-78. There was a female predominance (n=212, 71.1%). The majority of the participants were with a university degree (n=135, 45.3), employed or self-employed (n=177, 59.4%). Of the total 298 participants, 141 (47.3%) had second Fitzpatrick skin type, 295 (99.0%) had no personal history of skin cancer, 278 (93.3%) had no first-degree family member history of skin cancer. All sociodemographic characteristics and self-reported objective risk factors are summarized in Table 1.
The median score of knowledge was 10.0 (IQR=8.0– 12.0) with a total possible score of 20. 177 participants (59.4%) reached less than or equal to ten points and 121 (40.6%) had more than ten points. Correct responses to knowledge questions are presented in Table 2. Fisher's exact test),

occupation and knowledge score (P<0.001, Fisher's exact test). No other statistically significant relationship was found.

Gender, age, educational level, occupation, Fitzpatrick skin type, personal and first-degree family member history of skin cancer is shown in Table 3. Statistically significant association was found among age and knowledge score ($\chi 2$ = 9.5, p < 0.01), educational level. There were no statistically significant associations between personal or first-degree relative history and frequency of individual attitudes and behaviors concerning the sun protection and skin cancer.

The relationships between gender, age and frequency of individual attitudes and behaviors concerning the sun protection/skin cancer were also examined (Table**4**).Regarding sun-protection behaviors, females reported more frequent sun- avoidance behavior such as avoiding going out between 11.00 (A.M.) and 3.00 (P.M.) during spring and summer period(χ^2 = 11.5,p<0.01);staying in the shade, using an umbrella ($\chi 2$ = 9.9, p < 0.01); wearing sunglasses ($\chi 2$ = 6.3, p < 0.05) and using sun protection cream with SPF ($\chi 2$ = 52.7, p < 0.001). As well females more often check their own skin for new moles or them changing than males ($\chi 2$ = 52.7, p < 0.001). Two age groups were also compared. As shown in Table 4, participants who are older than thirty years, more often avoid the sun between the hours of 11.00 (A.M.) and 3.00 (P.M.) ($\chi 2$ = 13.7, p < 0.01), wear a hat($\chi 2$ = 6.4, p < 0.05), check their own skin for any changes ($\chi 2$ = 9.1, p < 0.01). Also, this age group prefer to visit a doctor and use internet or other sources of information when noticing a new mole more often than younger participants ($\chi 2$ = 20.6, p < 0.001).

Table 1:Demographic Characteristics and Skin Cancer Risk Factors of Respondents(N =298)

Variables	N	%
Gender		
Women	212	71.1
Men	86	28.9
Age		
18-30	160	53.7
31-78	138	46.3
Educational level		
Basic and lower	5	1.7
General secondary	86	28.9
Vocational secondary	72	24.2
Higher	135	45.3
Occupation		
Employed or self-employed	177	59.4
Student	83	27.9
Pupil	3	1.0
Unemployed	3	1.0
Other	32	10.7
Fitzpatrick skin type		
1st	15	5.0
2nd	141	47.3
3rd	124	41.6
4th	17	5.7
5th	1	0.3
Personal history		
Yes	3	1.0
No	295	99.0
First-degree family member history		
Yes	20	6.7
No	278	93.3

Table 2: Correct responses to knowledge questions (N= 298)

Questions	Correct response	N	%
The most common form of skin	Basal cell carcinoma	26	8.7

cancer is?			
Women primarily develop melanoma on what area of their body?	The legs	27	9.1
Men primarily develop melanoma on what area of their body?	The back	126	42.3
The most common treatment for melanoma is?	Surgery	130	43.6
Which of the following is not a sign of melanoma?	The color over the entire mole is the same	227	76.2
Among ------------------females skin cancer is?	Second most common cancer	136	45.6
Among ------------- males skin cancer is?	Third most common cancer	112	37.6
Frequent tanning bed applications up to 35 years of age increase the risk of developing skin cancer by	75%	63	21.1
Sunburn in childhood is a more significant factor in skin cancer than sunburn as an adult	True	149	50.0
It is possible to become sunburnt on a cloudy day	True	223	74.8
What is the recommended amount of time that individuals should apply sunscreen before going outdoors?	15-30 minutes	205	68.8
How often should individuals reapply sunscreen?	Every 2 hours	168	56.4
Is it necessary to reapply water resistant SPF cream after swimming?	Yes	196	65.8
SPF 50+ protects 2 times stronger than SPF 30	No	109	36.6
Having dark colored skin increases risk of skin cancer?	No	206	69.1
The number or type of moles on the body increases risk of skin cancer?	Yes	249	83.6

Table 3: Knowledge by gender, age, education level, occupation, fitzpatrick skin type, personal history and first- degree family member history (N = 298)

		Score				p value
		<10		<10		
		N	%	N	%	
Gender	Female	119	67.2	93	76.9	0.072
	Male	58	32.8	28	23.1	
Age	18-30	82	46.3	78	64.5	0.002**
	31-78	95	53.7	43	35.5	
Educational level	Basic and lower	1	0.6	4	3.3	0.001**
	General secondary	48	27.1	38	31.4	
	Vocational secondary	56	31.6	16	13.2	
	Higher	72	40.7	63	52.1	
Occupation	Employed or self-employed	117	66.1	60	49.6	0.000***
	Student	34	19.2	49	40.5	

	Pupil	1	0.6	2	1.7	
	Unemployed	1	0.6	2	1.7	
	Other	24	13.6	8	6.6	
Fitzpatrick skin type	1st	7	4.0	8	6.6	0.707
	2nd	82	46.3	59	48.8	
	3rd	77	43.5	47	38.8	
	4th	10	5.6	7	5.8	
	5th	1	0.6	0	0.0	
Personal history	Yes	0	0.0	3	2.5	0.066
	No	177	100.0	118	97.5	
First-degree family member history	Yes	12	6.8	8	6.6	0.955
	No	165	93.2	113	93.4	

*p<0.05,**p<0.01,***p<0.001

Table 4: Prevalence of frequency individual attitudes and behaviors concerning the sun protection/skin cancer (n = 298)

	Gender				P value	Age group				P value
	Women	Men				18-30	31-78			
	N	%	N	%		N	%	N	%	
Check own skin for new moles or moles changing										
Yes	183	86.3	61	70.9	0.002**	121	75.6	123	89.1	0.003**
No	29	13.7	25	29.1		39	24.4	15	10.9	
Action when noticing a new mole										
Visit a doctor	107	50.5	32	37.2	0.121	64	40.0	75	54.3	0.000***
Ask partner or friend to look at	19	9.0	11	12.8		25	15.6	5	3.6	
Ignore it	39	18.4	26	30.2		42	26.3	23	16.7	
Use internet or other sources of information	30	14.2	11	12.8		16	10.0	25	18.1	
Other	17	8.0	6	7.0		13	8.1	10	7.2	
Not going out between 11.00 (A.M) and 3.00 (P.M) during spring and summer period										
Always	42	19.8	15	17.4	0.003**	20	12.5	37	26.8	0.001**
Seldom	132	62.3	40	46.5		93	58.1	79	57.2	
Never	38	17.9	31	36.0		47	29.4	22	15.9	
Staying in the shade using an umbrella										
Always	37	17.5	14	16.3	0.007**	28.0	17.5	23.0	16.7	0.060
Seldom	153	72.2	51	59.3		102	63.7	102	73.9	
Never	22	10.4	21	24.2		30	18.8	13	9.4	
Wearing a hat										
Always	54	25.5	31	36.0	0.158	37	23.1	48	34.8	0.040*
Seldom	124	58.5	41	47.7		99	61.9	66	47.8	

Never	34	16	14	16.3		24	15.0	24	17.4	
Wearing light coloured clothing or light protective clothing									
Always	47	22.2	13	15.1	0.305	29	18.1	31	22.5	0.349
Seldom	118	55.7	49	57.0		88	55.0	79	57.2	
Never	47	22.2	24	27.9		43	26.9	28	20.3	
Wearing sunglasses									
Always	113	53.3	32	37.2	0.042*	76	47.5	69	50	0.843
Seldom	79	37.3	43	50.0		66	41.3	56	40.6	
Never	20	9.4	11	12.8		18	11.3	13	9.4	
Using sun protection cream with SPF									
Always	54	25.5	31	36.0	0.158	37	23.1	48	34.8	
Seldom	124	58.5	41	47.7		99	61.9	66	47.8	
Never	34	16	14	16.3		24	15.0	24	17.4	

*p<0.05,**p<0.01,***<0.001

V. DISCUSSION

There has been a significant increase in the incidence of skin cancer throughout the world in the last few decades, despite increasing medical awareness of the dangers of skin cancer and the advancement of diagnostic procedures. Implementing sun protection measures and appropriate behaviors into daily basis, researches state that around 80% of skin cancer cases are preventable [8, 17]. In spite of this, the incidence of skin cancer is still rising [4, 17].Unfortunately, no studies have been conducted to estimate the level of knowledge, behaviors and attitudes of the local population toward skin cancer, sun exposure and protection. Hence this study was made to address this issue. Total 386 questionnaires were delivered and 306 questionnaires were recovered, corresponding to a response rate of 79.3%. 8 of the returned questionnaires were excluded due to incomplete filling. The remaining 298 questionnaires were accepted as valid and used in the final analysis, corresponding to a completion rate of 97.4%. The subjects who participated in the survey were aged between 18-78, with a mean age of 34.5 (SD=14.5). 160 participants (53.7%) were in age group 18-30 and 138 (46.3%) in age group 31-78.In the present study, 59.4% of the respondents got score less than or equal to ten (from total of twenty), which showed that overall knowledge about skin cancer is low. The least accurately understood questions were about the most common form of skin cancer, area of the body on what women primarily develop melanoma and how frequent tanning bed applications up to 35 years of age increase the risk of developing skin cancer, whose were only responded to correctly by 8.7%, 9.1% and 21.1% of the sample. Hobbs et al. obtained similar results in a study of collegiate athletes [14]. Many studies claimed that women had statistically more knowledge concerning sun protection and skin cancer than men [13, 18]. Our study showed controversial data. Also, studies by Ergin et al., 2011 and Yurtseven et al., 2012 declared that families that have a history of skin cancer have a greater depth of knowledge about the subject since they have personally seen the effects of skin cancer [9, 19]. In our study we found that there is no statistically significant association between gender, personal or first-degree family member history of skin cancer as Fitzpatrick skin type and knowledge level. This study showed association between gender, age and behaviors, so the second hypothesis was also denied. We found that women were taking more protective measures for sun protection than men. This was in agreement with other studies [18, 20]. One difference between our study and studies done by Kristjánsson et al., and Cinar et al., was that in our research was no declared higher knowledge level in female group which could correlate with more protective behavior [18, 20]. Unfortunately, men of all ages in this study still reported high levels of unprotected sun exposure, which would be significantly increasing their risk of developing skin cancer [21, 22]. Also, our study found that in the section of attitudes and behaviors against sunlight's harmful effects, people younger than thirty years were found to avoid the sun between the hours of 11.00 (A.M.) and 3.00 (P.M.) and wear a hat less often. On the contrary to our data, Baron-Epel and Azizi in 2003found that people 45 years and older were less insistent in taking protective measures against sun-light [23]. Several factors including age, educational status and occupation should be kept in mind when designing intervention programs. There is clearly a need for changing public's attitudes and

protective behaviors. Deeper understanding of the gender and age specific preferences will help in planning future research and health education programs.

VI. CONCLUSION

According to our results, sociodemographic factors age, educational level and occupation were associated with knowledge level about skin cancer, only gender showed no statistically significant association. No statistically significant relationship was found between objective risk factors and knowledge level. These findings partially supported first hypothesis. Further analyzing data, we ascertained statistically significant association between behaviors, attitudes and age, gender. However, there is no association between personal or first degree relative history and behaviors, attitudes, which also partially supported second hypothesis.

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