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Research Article

**A CROSS-SECTIONAL ASSESSMENT OF KNOWLEDGE,
ATTITUDE AND PRACTICES OF ADULT POPULATION
TOWARDS SUN EXPOSURE AND PROTECTION IN
PAKISTAN**

Investigators: Dr. Shaiza Ijaz, Dr. Shafaq Ismail, Dr. Laiba Fayyaz, Dr. Yumnah Razzaq,
Dr. Menahil Mukhtar (CMH, Lahore), Dr. Muhammad Ashraf Chaudhry (HOD)
Community Medicine CMH LMC).

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Abstract:

Objective: Skin diseases pose a great burden on health system of our country and significantly reduce the quality of life due to possible skin cancers, cosmetic issues and lack of acceptance in society. Our aim was to assess the knowledge, attitude and practices of population towards sun exposure and sun protection, to identify the area, which needs to be worked upon to bring about a positive change in our population and decrease the prevalence of skin diseases.

Method: It was a cross-sectional study. It was held after the approval of the ethical review committee of CMH Lahore Medical College. Sample size of 386 was calculated using the WHO calculator. Data was collected via self-filled online forms that were distributed as links among the general population in reach. The questionnaire comprised of four parts; socio-demographic background and skin type, assessment of the knowledge of population regarding harmful effects of sun on skin and sunscreen, attitude of people towards sun protection measures and practice towards sun protection measures. Collected data was subjected to SPSS version 24.

Result: In the study, 79.8% participants were females. Statistically significant association was present between the use of sunscreen and its several benefits, along with its avoidance and the contemplation that it has adverse effects ($p=0.001$). There was a statistical correlation between participants who considered face cover to be enough instead of use of sunscreen ($p=0.001$) as well as those who believed that sunscreen had harmful effects on vitamin D levels in the body ($p=0.006$).

Conclusion: The study revealed that a majority of the population has knowledge about the disadvantages of sun exposure. It also concluded that although the Pakistani population has a positive attitude regarding the use of sunscreen, there are a few misconceptions that affect the practice.

Keywords: Cosmetic issues, sun protection, sunscreen, cancers, awareness.

Corresponding author:**Shaiza Ijaz,**

Contact number: +923008118742

Email: shaizaijaz@gmail.com

QR code



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INTRODUCTION:

Globally, skin diseases are considered among 4 most common causes of non-fatal disease burden, particularly in developing countries.[1] Ultraviolet (UV) radiation from sun exposure is an established modifiable risk factor for number of environmentally-influenced skin disorders, including skin cancer.[2] UV irradiation have both acute and long term effects on body tissues especially cutaneous tissue. Acutely, it can cause redness, tanning, and immunosuppression, both local and systemic. The mechanism through which UV irradiation produces its side effects depends upon DNA damage. Persistent UV radiation exposure leads to photoaging, immunosuppression, and photocarcinogenesis which ultimately leads to the development of skin cancers.[3]

The incidence of skin cancers has been on the rise over the past few decades. Presently, non-melanoma skin cancers accounts for 2 to 3 million cancer cases, and approximately 132,000 cases of melanoma skin cancers occur globally each year.[4] In Pakistan, the prevalence of skin malignancies is relatively less as compared to the western world. In our population, non melanoma skin cancers are more common. [5] There is significant evidence from different studies that establishes ultraviolet radiation as a carcinogen especially in regard to skin malignancies. The evolution of skin cancer depends upon the timing and nature of sun exposure. Intermittent UV irradiation during childhood and adolescence is strongly linked with melanoma and basal cell carcinoma of skin, whereas, squamous cell cancer is more strongly related to constant or cumulative sun exposure. [6]

The ill effects of sun exposure and UV irradiation on skin can be prevented with Sun protection practices. Efficient sun protection requires an effective lifestyle and behavior changes including avoiding sun exposure between 10:00 a.m. and 2:00 p.m., seeking shade, using sunscreen products, hats, protective clothing, and sunglasses. [7] The Knowledge, attitudes and practices (KAP) of the public toward sun exposure and protection have been studied in several countries; however, there is no data available from Pakistan. This study aims to determine the level of KAP regarding sun exposure and protection among adults and to establish the prevalence of sunscreen use on the country level. The results of this study can be utilized by health authorities to take necessary actions to enforce positive behavioral change in regard to sun protection.

METHODOLOGY:

This cross-sectional study took place via an online survey that included the population of Pakistan from all provinces, above the age of 16 years, with access to internet. The sample size of 386 was calculated using WHO Sample Size Calculator with 95% confidence level, 5% margin of error and 50% anticipated population proportion and snowball technique was employed for sampling. The study was held after the approval of Ethical Review Committee of CMH Lahore Medical College. After obtaining approval, the data collected over the period of 3 months, via online questionnaires made with Google Forms and distributed as links among general population in reach. The questionnaire comprised of five parts. The first part covered demographics, socio economic background and skin type. The second part determined the knowledge of participant regarding harmful effects of sun exposure and use of sunscreen. The third part of questionnaire was related to general attitude of population towards sun protective measures including use of sun screen and skin clothing. In next section, for assessing the practice of sun protective measures, questions regarding use, application and reapplication of sunscreen were asked. Lastly, factors responsible for deterring the participant from using sun screen were recorded. The candidates were informed about the objectives of study by written explanations and their consent was received online via Google forms. The questionnaire was self-administered and filled by the candidates, and the data was kept anonymous. All questions and clarifications were welcomed and candidates had the authority to withdraw at any point. Collected data was entered and analyzed by SPSS version 25. For presentation of data, mean and standard deviation were employed for quantitative variables while qualitative data was presented as frequency and percentages. Association between different variables was calculated using chi-square and P-value <0.05 was considered statistically significant.

RESULTS:

Total 386 participants completed the survey. The mean age was calculated to be 25.08. Among total participants, 308 (79.8%) were females while the remaining 78 (20.2%) were males. Majority of them (39.1%) were students and belonged to Punjab (53.1 %). Out of total participants, 40.2 % had type iv skin, 31.3 % had type III skin while remaining have other types. (table1) Regarding the ill effects of sun exposure on skin; 96.4% believed that prolong exposure could cause sun burn, but only 77.7% of the participants acknowledge the relation between prolonged sun exposure and skin cancer. Most of the participants (84.7%) were aware of the association between sun exposure and skin ageing. Understanding

regarding sun exposure and hyper pigmentation was found in 88.6% of participants. Among total, 88.1 % believed that artificial UV radiations are harmful, 79.3% knew about most harmful period of sun exposure is between 10am and 2pm and 58.5% thought that sun exposure is more harmful to children than adults.

In response to questions regarding knowledge of sunscreen, 87.3% believed that sunscreen are protective while 35.5% believed that sunscreen can be harmful in various ways. Relation of both believes was found to be statistically significant with use of sunscreen ($p = 0.001$)(table 3). Out of total, 96.1% believed that men also need sunscreen and only 32.6% knew the meaning of PA value on sunscreen. There was a statistical correlation between the use of sun products and a belief that face cover (hijab) provides sufficient protection instead of sunscreen ($p = 0.001$).The association between the use of sunscreen and its harmful effected on vitamin D levels in the body showed that out of 386, 136 agreed to the association, while 250 did not and this association was also found to be statistically significant ($p = 0.006$) (table 2).

Regarding attitude of participants towards sun protection measures, 75.1% found it difficult to protect themselves from sun, 78.2% showed positive response and were worried about sun exposure and 89.6% acknowledges that harmful sun exposure can be prevented with personal protection. Majority of participants (82.9%) did not find tan attractive.

When inquired about personal practices, 25.6% wore clothes and abaya to protect themselves from sunlight,

28 % seek shade, 13.2% used sunglasses, 6.5% wore hat, 9.8% avoided sun exposure between 10am and 2pm. Sunscreen as a personal protection measure was used by 72.3% of participants, and among them only 17.9% always apply sunscreen . However, 22.8% of participants had never applied sunscreen. Referring to use of sunscreen; 47.9% choose their sunscreen depending upon the PA and SPF value, 29.0% depend on the advice of their dermatologist whereas remaining depend upon media (11.9%) and pharmacist (11.1%). Sunscreen with SPF value of 50 was used by 23.6 % of participants while 45.6% didn't know the SPF value of their sun screen. The relation between knowledge of the SPF value of sunscreen and use of sun screen was statistically significant.9p = 0.001)(table4). Majority of the participants (51.0%) apply sunscreen 15-20 minutes prior to sun exposure and only 25.6% apply it on their face, neck and hands. Most of participants (56.2%) never reapply the sunscreen, and among those who reapply, only 4.7% reapply always. Among total, 57% had tan 1or more than 1 time this year..

Lack of time (29.3%) and being uncomfortable (42.0%) were most common reasons for not using sunscreen and personal protective measures, respectively. In case of sun screen, other reasons were reported to be unawareness (9.1%), too expensive (11.1%), not liking its sensation on skin (16.3%) and inconsistency with makeup (10.1%). Whereas for sun protection measures, unawareness about sunlight's harmfulness (14.2%), and being unconvinced about benefits of these measures (14.8%) were found to be the reason that deter our population from practicing sun protection measures.

Table 1: Demographic characteristics of the study participants (n = 386)

Variable (characteristics)	n (%)
Gender	
Male	78(20.2)
Female	308(79.8)
Occupation	
Students	151(39.1%)
Housewife/Unemployed	30)7.8%(
Healthcare workers (including students)	53(13.7%)
Others	152(39.4%)

Province	
Punjab	205(53.1)
Sindh	89(23.1)
Baluchistan	23(6.0)
KPK	57(14.8)
Skin type	
Type1	38(9.8)
Type2	32(8.3)
Type3	121(31.3)
Type4	155(40.2)
Type5	36(9.3)
Type6	4(1.0)
Mean Age (years)	25.08±6.0

Table 2: Association between use of sunscreen with hijab and harmful vitamin D levels.

		Hijab		Total	p-value
		Yes	No		
Do you use sunscreen	Always	11	58	69	0.001
	Often	32	73	105	
	Sometimes	57	67	124	
	Never	55	33	88	
	Total	155	231	386	
		Harmful to vitamin D levels in body		Total	p-value
Do you use sunscreen	Always	18	51	69	0.006
	Often	29	76	105	
	Sometimes	46	78	124	
	Never	43	45	88	
	Total	136	250	386	

Table3: Association between use of sunscreen , harmful to skin and protective effect of sunscreen products

Do you use sunscreen	Harmful to skin in any way			Total	p-value
		Yes	No		
Do you use sunscreen	Always	15	54	69	0.001
	Often	27	78	105	
	Sometimes	45	79	124	
	Never	50	38	88	
	Total	137	249	386	
Do you use sunscreen	Protective			Total	p-value
		Yes	No		
Do you use sunscreen	Always	66	3	69	0.001
	Often	100	5	105	
	Sometimes	109	15	124	
	Never	61	27	88	
	Total	336	50	386	

Table4: Association between use of sun screen and knowledge of SPF (n = 386)

		Do you use sunscreen?				Total	p-value
		Always	Often	Sometimes	Never		
SPF	Yes	61	74	71	26	232	0.001
	No	8	31	53	62	154	
Total		69	105	124	88	386	

DISCUSSION:

In Pakistan, statistics regarding skin diseases and cancers are scarce. According to Globocan 2018 report, non melanoma skin cancers (NMSC) are 18th and melanoma are 32nd most common cancer in our population. However, regional registries state

relatively high incidence of skin cancers. [8] When compared to Western population, the incidence of skin malignancies is quite low in Asians. However, the incidence of NMSC is gradually increasing in our population and it is point of concern for relative authorities. [9] Although, etiology of skin cancers is multi-factorial, excessive exposure to UV radiation is

most important risk factor. The preventive strategy against skin cancers particularly focuses on sun protection and use of sunscreen. Population should be advised to avoid sunlight exposure between 10 a.m. to 2 p.m and tanning practices in salons and natural sunlight. Sunscreen of at least SPF 30 should be applied appropriately, at least 30 minutes before sun exposure and reapplied every 2 hours while outside. Sun-protective behavior including seeking shade and use of protective clothing should be practiced.[10] This nation-wide study provides an assessment of knowledge, attitude and practices of our population regarding the protective measure mentioned above and provides essential information for health care authorities.

According to the results of this study, majority of population had satisfactory knowledge in regards to harmful effects of prolong sun exposure on skin including cancers, aging, hyper pigmentation and sun burn as well as harmful effects of artificial UV radiations. In contrast to analogous studies conducted in other countries, more of our population (77.7%) had awareness regarding association between sun exposure and skin cancer as compared to Saudi Arabia (55%), but the percentage is low as compared to western countries including Australia (90%), Canada (85%), and United states (92%). [11] This difference in knowledge can be contributed to lack of awareness campaigns and education regarding skin cancer in our part of world as it has been indicated in various studies that Sun-protective behaviour is effectively related with skin cancer knowledge. [12] Furthermore, almost forty percent of population think that skin covering e.g Hijab provides sufficient sun protection instead of sunscreen, as compared to Saudi Arabia where twenty seven percent had similar belief.[13] Contrary to this popular opinion, several studies have shown that, commercially available textiles provide only limited UV protection with a UV protection factor of less than 15 being noted in one-third of clothes. [14] On the other hand, using specialized UV-blocking garments can provide an adequate and easy alternative to sun screen against the hazards of sunlight. The alignment of people towards skin protective clothing can be utilized by the health authorities in encouraging them to use UV blocking cloth. However, efforts towards spreading awareness are essential to change people's behavior regarding use of adequate and correct sun-protective clothing. This study, also reports a significant misconception in our population, where thirty-five percent people believe that sunscreen usage is harmful to body levels of vitamin D. Both above mentioned factors can contribute towards lower prevalence of sun screen usage in our people, and it is quiet worry some. Our Population showed a positive

attitude towards the sun protective measures, with almost 90% of participants accepting the importance of these measures. This information should be utilized by the health care authorities in introducing suitable measures in our society that will be readily accepted.

The knowledge of our population about sun screen was somewhat satisfactory, with almost sixty five percent of people thought that sun screens are not harmful to skin and eighty-seven percent of population acknowledged that sun screens are protective. There is a statistically significant relation between the two variables and the sun- screen usage. People who find sun-screen harmful are less likely to use it, and a person who thinks that sun screen are protective, is more prone to apply it. These shows that the positive change can be brought about in the community by educating them about the benefit and protective factor of sun screen, as well as negating negative opinion regarding it and this in turn will significantly lower the resistance for applying sun screen. This study also point out that there is a statistically significant relation between the knowledge of SFP and sun screen usage. This further affirms the point, that increasing the awareness regarding sun screen will cause an increase in sun screen usage behavior.

Sun protection practices, for example, clothes, seeking shade, wearing hats and glasses and avoiding sun exposure between 10am to 2pm, were lacking in our population. Results of this study showed that only 69 participants out of 386 apply sunscreen regularly, whereas 88 participants said that they have never used sunscreen. This percentage (17.9%) of our population using sun-screen regularly is lower than that of reported in different studies from Saudi Arabia but is higher from India. [11][13][15] Although, dark skinned people are protected somewhat against skin cancers, but the sudden rise in incidence of skin malignancies in our population could be due to synergistic effect of lack of sun screen and depletion of ozone layer, that allows the harmful UV radiation to reach the earth. [16] The prevention of skin neoplasm is incomplete without emphasizing on need of better sun screen awareness and usage by the population.

Lastly, number of reason were given by our population that deters or stops them from practicing sun protection measures and applying sun screen appropriately. These reason can be targeted in order to increase the acceptance and eventually the practice of sun protection measures.

Considering the scarce resources and limited time, snowball sampling technique was a feasible method

for data collection. Although representativeness is not guaranteed but adequate representation of each province was ensured. The data is significantly skewed towards female population and this can create a bias in the results. The language of our questionnaire (English) and the non-availability of internet along with lack of usage of digital platform in many parts of country, may have contributed to sampling bias. Keeping in view of all the limitations, further studies should be conducted including all socioeconomic classes and all the limitations should be minimized for better results in future.

CONCLUSION:

This study indicates that there is an acceptable level of awareness among our population about harm from sun exposure and sun protection measures. However, few misconceptions have also been reported especially about sun screen usage. Even though the attitude of population was positive but practice of sun protection is generally insufficient in adults and only a small number of our population uses sunscreen regularly. The results of this study emphasizes on the need for future awareness programs to raise the knowledge of masses regarding sun's damaging effects on the skin and to highlight the significance of sunscreen use, as well as, negating the misconceptions. In addition, prospective studies should point towards the importance of protective clothes among our population, as well as addressing the reason for lack of sun protection practice.

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