Original Article

Evaluation of Knowledge, Attitudes and Practices on Facial Skincare Routines and Cosmetic Products in Undergraduates of Universities and Higher Educational Institutes in Western Province, Sri Lanka

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ABSTRACT

Maintaining the skin's structural and functional integrity is largely dependent on proper skincare. Numerous dermatological problems can be caused by insufficient skincare techniques and inadequate information. For this reason, following an appropriate skincare routine is essential to preserving the health of the skin. The purpose of this study was to evaluate undergraduates in universities and other higher education institutions in the Western province of Sri Lanka regarding their knowledge, attitudes and practices regarding facial skincare practices. A structured questionnaire (N=255) was used in descriptive cross-sectional research of undergraduates in the Western province who were between the ages of 18 and 30. Ethical clearance was obtained from the Ethics Review Committee at CINEC Campus. There were 21.18% male participants and 78.82% female participants in the study, which included 145 undergraduates from state universities and 110 from non-state Higher Educational Institutes. The results showed that while buying face skincare products, students consider into thought several aspects, such as brand (66.27%), price (69.02%), ingredients (74.50%), expiration date (65.10%), skincare benefits (73.72%), smell (31.37%), and container (25.10%). Merely 9.42% of respondents preferred synthetic components in cosmetic products, compared to a sizable majority (90.58%) who preferred natural ones. When it came to applying sunscreen, 33.33% did it five minutes before exposure to sunlight, and 56.08% did it thirty minutes beforehand. While 34.11% of respondents knew that an optimal sunscreen in Sri Lanka should have a UV protection factor of between 30 and 50, 43.92% did not. The primary reasons given for using skincare products were to enhance appearance and texture (62.74%), prevent sunburns (54.90%), and improve skin health (76.08%). Notably, the most often used skincare items were moisturizer (48.23%) and face cleanser (82.53%). Furthermore, (67.06%) of undergraduate students chose skincare products for their faces according to their skin type; (27.45%) did it infrequently, and (5.10%) never gave it any thought. The study revealed that some undergraduates lack accurate awareness about skincare routines, indicating a need for additional knowledge in this area.

Index Terms – Cosmetic, Facial, Skincare

INTRODUCTION

Skin is the largest organ of the body, which aids in maintaining the integrity of the host while also allowing the host to connect with the outside world [1]. It serves as a barrier between the internal and the external environment, providing many functions necessary for human survival such as protection from dehydration and excessive water influx, electrolyte homeostasis maintenance, thermoregulation, tactile sensation, antimicrobial defense, and protection from environmental toxins, trauma, and ultraviolet (UV) radiation [2]. Accurate knowledge, good attitudes and healthy practices will surely have a positive effect on the consumer's skin condition boosting self-confidence. Hence, it is important to take care of the skin regularly in a proper manner.

The skin's three primary layers are the subcutaneous tissues, epidermis and dermis. The epidermis generally consists non-viable part which is made by the stratum corneum and the viable part which contains the remaining layers of the epidermis. Apocrine glands, sweat ducts, and hair follicles are a few other appendages that presents in human skin [3].

Facial skin can be considered as the most concerned skin in the body by individuals. Maintaining a proper facial skin care routine may aid the physical, mental and social well-being of an individual followed by society as well. Despite a skincare routine can begin at any age or period, dermatologists and cosmetologists agree that skincare and facial routines should begin as early as teens.

The term "skin care" refers to procedures that help keep the skin in its most comfortable and sanitary form. These procedures involve cleansing one's skin, using skin care products, and photoprotection. It is a common process that is conducted daily in various settings, depending on whether the skin is too dry or too wet. Cosmetic products, such as skincare ointments, lotions, and powders, are often manufactured or natural substances, or mixes of both, that contain a wide spectrum of chemicals to which we are constantly exposed [4]. Sunscreen usage is a modifiable behavior that can help lower the risk of skin cancer, avoid sunburns, slowing photo ageing, and treat photosensitive issues.

The knowledge, attitudes, and practices around skincare have been the subject of several studies carried out in various countries. According to a study done in Thailand in 2022 by Nitiyarom and coworkers, gender and age group have a significant impact on teenagers' skin care behaviors and knowledge [5]. According to their study, only a small percentage of teenagers routinely use sunscreen, despite knowing that it may minimize the effects of sunlight. They have further elucidated that the main sources of skin care information that teenagers looked up were television and radio, print media, and individuals. According to the Indonesian study conducted by Kawa, Rahmadiani, and Kumar in 2013, they concluded that consumer buying behaviour toward cosmetics heavily depends on the brand name, packaging, location, and store environment [6].
There are various studies based on the skincare routine of university students. Attitudes and behaviour of female medical students related to facial skin care routine were assessed by [1], conducting a cross-sectional study from Feb 2016 to May 2016. The information collected through a self-administered questionnaire indicated that 76.7% of the participants do not follow regular skincare routines, 66% do not use sunblock and 29% stated that they have suffered from sunburn. Lotions and moisturizers were the most commonly used products (74%). On the other hand, the use of makeup was higher than the use of skin care facials [1]. Also, Upadhyay and coworkers evaluated the awareness and practices regarding skin care among 300 medical students from Western India by conducting a cross-sectional study. The majority of participants were female (67%) and the rest (33%) were males. The participants were aged from 17 to 23 years. (31%) believed that the face should be washed twice a day. Students were also aware of the benefits of removing make-up before sleep (51%). However, 70.3% of the participants were unaware of the sunscreen appropriate for them to use. But 15.7% were aware that it should be 30-50 SPF [2].

However, studies are scarce regarding skin care awareness and practices among undergraduate students in Sri Lanka. Hence, this study was carried out to evaluate the knowledge, attitudes and practices regarding facial skin care routine and cosmetic products among undergraduate students in Western Province, Sri Lanka.

RESEARCH METHODOLOGY

The Research study was a descriptive cross-sectional study. The study population was undergraduates in state and non-state universities and higher educational institutes in Western Province, Sri Lanka. The 7 state universities and 12 non-state higher educational institutes which provide bachelor degrees in the Western province were selected for the study. The sample size was calculated by using a standard formula (n= [Z2 X p (1-p)]/d2 where n= Sample size, Z = standard normal deviation for the chosen confidence level. Z will be 1.96 in confidence level 95%, p =

expected proportion of the subjects with the characteristics and d = margin of error). The sample size in this preliminary study was 255 participants. The data set used in the study was collected by a survey administered to state and non-state undergraduates at universities and higher educational institutes in the Western province of Sri Lanka, who have given their consent to participate in the study and who are free of any physical or mental disabilities that may hinder them from responding to the questionnaire. Participants who did not wish to provide data for the research and those who did not comply with the relevant admission recommendation were excluded.

The Survey contains 30 questions selected to assess the knowledge, attitude and practices toward using facial skincare routine. Survey data were collected from a convenience sample, using a self-administered questionnaire survey. Structured questionnaires with close-ended questions were used in the current study to gather information about respondents' knowledge, attitudes and practices regarding facial skincare routine. A validated questionnaire was prepared as a Google form in three languages i.e. Sinhala, English and Tamil, and distributed through social media platforms openly inviting undergraduates from state and non-state universities in Western province. Those who had consent to participate in the study filled out the consent form and the questionnaire.

Ethical clearance for this study was obtained from the Ethics Review Committee of the CINEC Campus, Malabe, Sri Lanka (ERC No: ERC/CINEC/2022/029).

The questionnaire consisted of four categories. i.e., Socio-demographic characteristics, Knowledge of participants towards facial skincare routines, Attitudes of participants towards facial skincare routines and Practices of participants towards facial skincare routines

The data was analysed using SPSS version 26. Descriptive statistics, mean ±SD, frequencies, and percentages were computed. Normality is assessed using graphical representations and Kolmogorov statistics. The continuous variables were compared using ANOVA and categorical variables using Chi-square statistics. $p<0.05$ was significant.

RESULTS

The knowledge, attitudes, and practices of undergraduates on facial skin care of undergraduates of universities and higher educational institutes in the Western province, of Sri Lanka were evaluated by analyzing data gathered by an online questionnaire.

DEMOGRAPHIC DATA

Among the participants, the majority were female (78.82%) and belonged to the age category of 22-24 years (43.52%) (Table 1). Further as shown in Table 1, the majority of undergraduates are from state universities (56.86%) and the majority have a health science background (42.35%).

Table 1: Socio-demographic characteristics of the undergraduates of universities and higher educational institutes in the Western province (N= 255)

Variable		(%)
Gender		
Male	54	21.17
Female	201	78.82
Age		
18-21 Years	22	8.62
22-24 Years	111	43.53
25-27 Years	87	34.12
28-30 Years	35	13.72
University/ Campus/ Higher Educational Institute Category		
State	145	56.86
Non-state	110	43.13
Subject stream of degree programme		
Medicine	4	1.56
Health Science	108	42.35
Bioscience	44	17.25
Animal Science	3	1.17
Nutrition	4	1.56
Engineering	19	7.45
Biotechnology	9	3.52
Engineering technology	2	0.78
Art	4	1.56
Commerce	14	5.49
Psychology	7	2.74
Information technology	15	5.88
Other	23	9.01
Engaging in self earning money		
Yes	110	43.13
No	145	56.86

In addition to the Socio-demographic characters shown in Table 1, the study has shown that the home town of the majority of participants (N=63) is Gampaha (Figure 1).

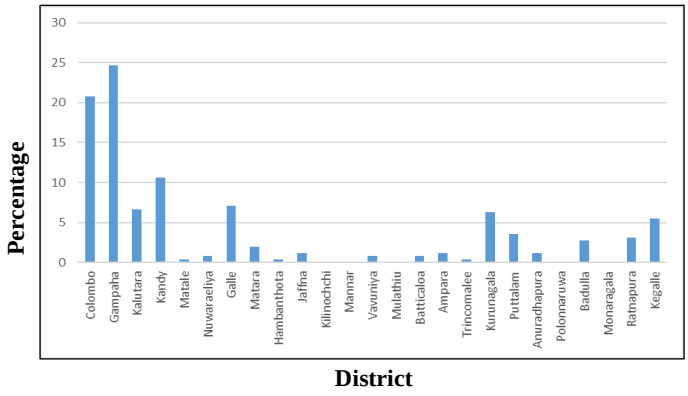

Figure 1: Home town of participants (N= 255)

Knowledge

Out of 255 undergraduate participants, the majority (N=209; 82%) know how to identify different types of skin (Figure 2).

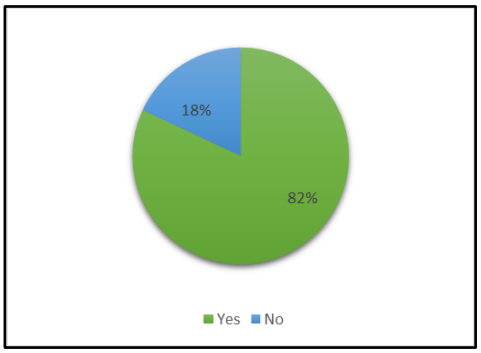

Figure 2: Ability to identify different types of skin among the undergraduates of universities and higher educational institutes in the Western province (N= 255)

All participants are aware of their skin type and the majority of participants reported that they have oily and combination skins (Table 2)

Table 2: Skin types of the undergraduates of universities and higher educational institutes in the Western province (N= 255)

Skin type	Number	(%)
Dry Skin	34	13.33
Oily Skin	79	30.98
Sensitive Skin	28	10.98
Combination Skin	78	30.59
Normal Skin	36	14.11

The study also evaluated the knowledge on sunscreen products and the questionnaire concerned about the knowledge on sun protecting factor (SPF) of sunscreen cream ideal for Sri Lanka (Table 3). The results showed that the majority (43.92%) of the participants are not aware of the SPF value of sunscreen products suitable for Sri Lanka.

Table 3: Response to the question "What should be the sun protection factor of an ideal sunscreen in Sri Lanka" by undergraduates of universities and higher educational institutes in the Western province (N= 255)

Response	Number	(%)
Below SPF 30	20	7.84
SPF 30-50	87	34.12
More than SPF 50	36	14.12
Don't know	112	43.92

In addition to that, the knowledge of the application of sunscreen products was also evaluated and the majority (56.08%) mentioned that 30 minutes before going outside is the best time to apply sunscreen (Table 4).

Table 4: Response to the question "When do you use sunscreen" by undergraduates of universities and higher educational institutes in the Western province (N= 255)

Response	Number	(%)
5 min before going outside	85	33.33
5 min after going outside	3	1.18
30 min before going outside	143	56.08
30 min after going outside	6	2.35

Attitudes

Among the participants, only a low percentage (20.39%) was strongly concerned about their facial skin routine (Figure 3).

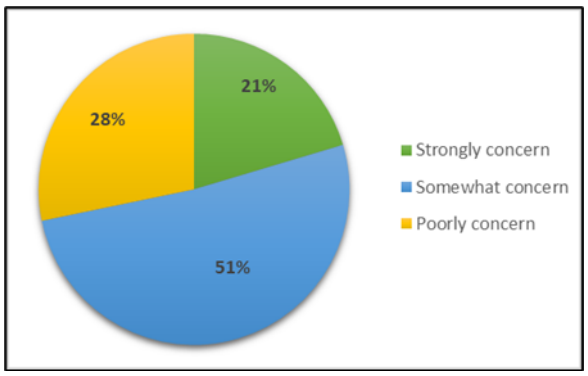

Figure 3: Percentage of concern about facial skincare routine among the undergraduates of universities and higher educational institutes in the Western province (N= 255)

Further, the study has evaluated the preference for natural and synthetic skincare routines among the undergraduates of universities and higher educational institutes in the Western province. As shown in Figure 4, the majority (n= 231) mentioned that they prefer natural skincare products.

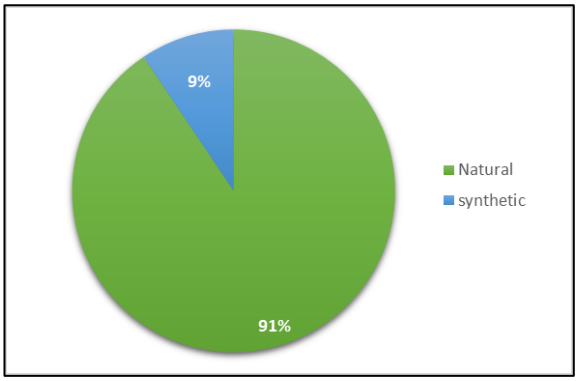

Figure 4: Percentage of preference for sources of skincare products among the undergraduates of universities and higher educational institutes in the Western province (N= 255)

In addition, the research has evaluated the reason for using skincare products among the undergraduates of universities and higher educational institutes in Western provinces. The questionnaire allowed us to select more than one option for the reason of using skincare products. As shown in Figure 5, the majority (76.08%) agreed with the statement that they use facial skincare products to improve the healthiness of skin. Only a few of the participants (1.18%) mentioned that they are using facial skincare products as a trend.

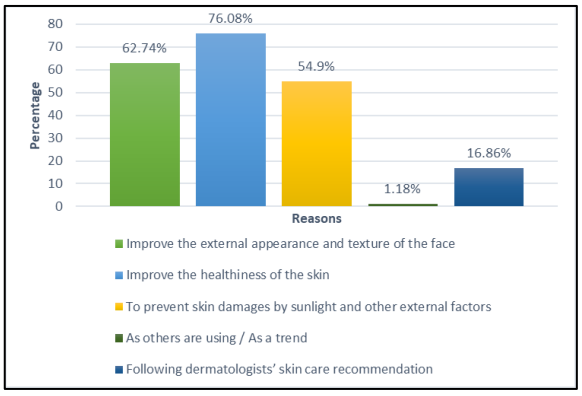

Figure 5: Percentage of reasons for using skin care products among the undergraduates of universities and higher educational institutes in Western province (N= 255)

However, the results showed that the majority of participants prefer medicinal drugs over cosmetic products when they have skin issues in their face (Figure 6).

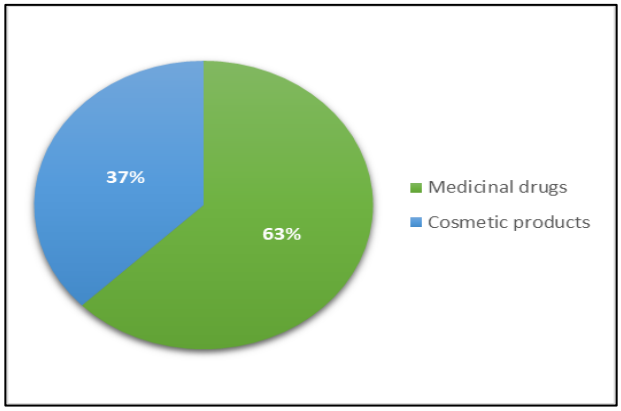

Figure 6: Percentage of preference for sources when having issues on skin, among the undergraduates of universities and higher educational institutes in Western province (N= 255).

In addition, the study evaluated the selection of facial skincare products according to the skin types and the majority mentioned that they selected those accordingly (Figure 7).

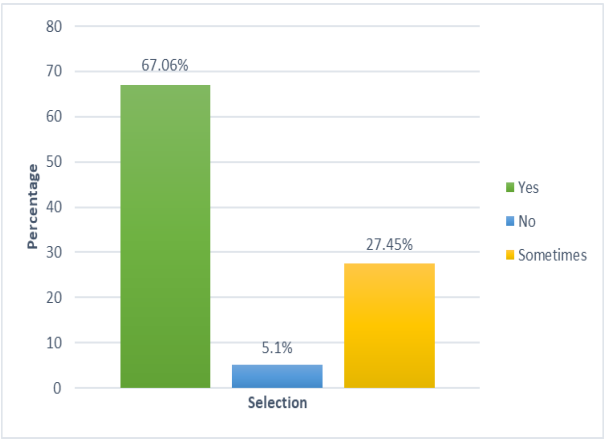

Figure 7: Selection of facial skincare products according to the skin types by the undergraduates of universities and higher educational institutes in the Western province(N= 255)

Practices

The research has also evaluated the cosmetic products generally used by undergraduates in universities and higher educational institutes in Western provinces. The questionnaire allowed to selection of more than one cosmetic product for each individual. Studies showed that participants are using face wash, face cleansers, scrubs, facial packs, facial serum, facial toner, under-eye serum, sunscreen, moisturizer, night cream, day cream and anti-ageing cream (Figure 8). Among the product list majority (82.53%) mentioned that they used facewash. However, only a minority of the participants (2.35%) is used under eye serum

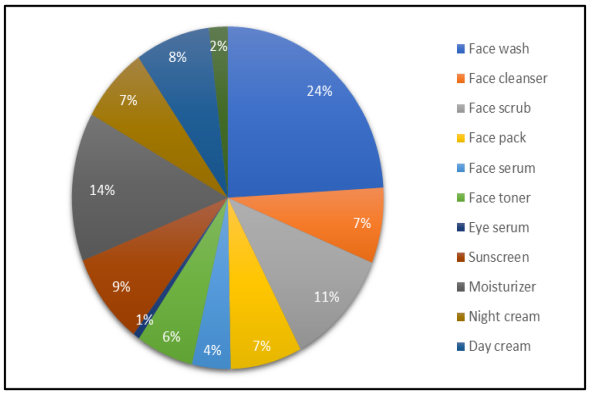

Figure 8: Commonly used facial skincare cosmetic products the undergraduates of universities and higher educational institutes in the Western province (N= 255)

Further, among the factors evaluated through the questionnaire regarding the purchasing facial skincare products, skin types (75.7%), ingredients (74.5%) and skincare benefits (73.7%) were identified as the factors considered by the majority when they purchasing a facial skin care product (Figure 9). The nature of the container was identified as the factor which pay the least attention (25%) when purchasing a facial skincare product.

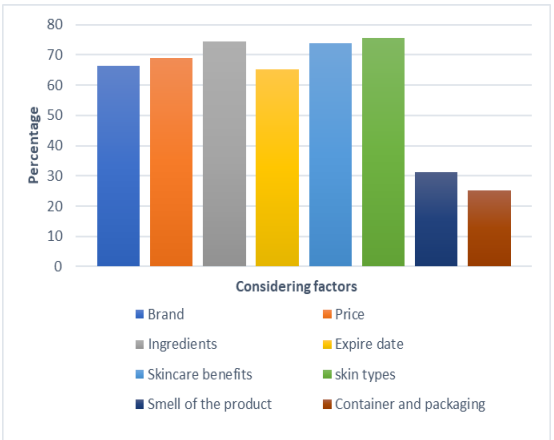

Figure 9: Factors considered when purchasing skincare products in the undergraduates of universities and higher educational institutes in Western province (N= 255)

Also, the research experiment evaluated the source of information about facial skincare products and the questionnaire allowed to mark the first, second and third choice of the participants according to priority (Figure 10). According to the responses, the majority mentioned they are giving priority to getting information about facial skincare products, by medical practitioners as the first choice (55.68%). The majority mentioned product labels (34.51%) and by recommendation (34.90%) as the second choice and mass media (36.86%) and social media (35.68%) as the third choice in the priority list of getting information about facial skincare products.

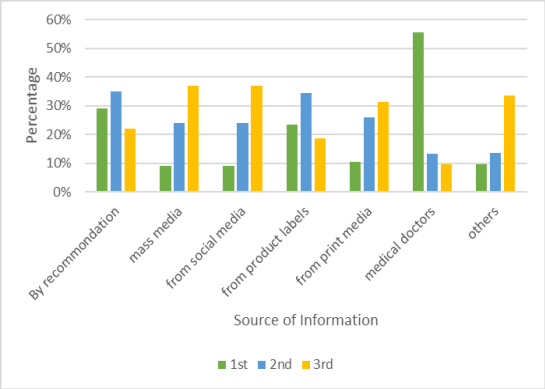

Figure 10: source of information about facial skincare products by the undergraduates of universities and higher educational institutes in the Western province (N= 255)

Further, the study evaluated the continuous use of the same facial skin care product long term (Figure 11) and the majority (64.31%) mentioned that they are continuously using the same product.

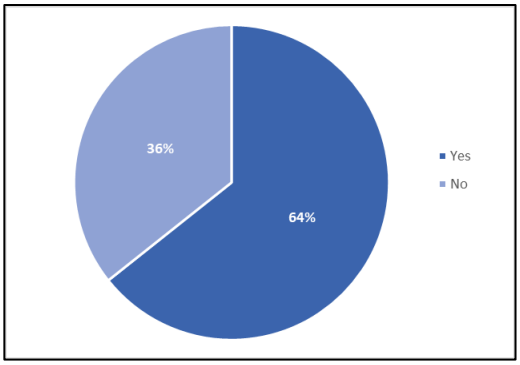

Figure 11: Percentage of continuous use of the same facial skin care product long term by the undergraduates of universities and higher educational institutes in the Western province (N= 255)

However, 71.76% of participants mentioned that sometimes they change the brand of the facial care product (Figure 12).

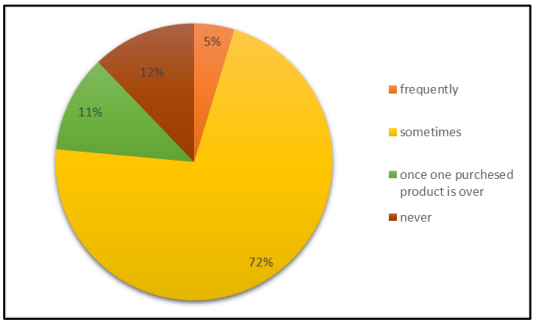

Figure 12: Percentage of frequency of change of brands of facial care products by the undergraduates of universities and higher educational institutes in the Western province (N= 255)

DISCUSSION

As the skin is constantly losing skin cells throughout the day, it's critical to maintain healthy, radiant skin. However, as the skin is one of the major components involved in the outside beauty of individuals, there is a huge attention on maintaining the appearance of the skin, especially in the youth generation. Hence, this study was focused on evaluating knowledge, attitudes and practices on skincare routines and cosmetic products among undergraduates who represent part of the youth generation in the country. Skincare is a wide range of practices that support maintaining the integrity of the skin, improving its appearance, and treating skin disorders. These may consist of proper diet, avoiding excessive sun exposure, and using appropriate emollients. Additionally, there are several varieties of skin, including combination, oily, dry, and normal skin. Depending on the type of skin, there are differences in recommended products and skincare regimens. Hence, the study focused on evaluating the knowledge about the skin types and their identification. Among the participants 82 % were able to identify their skin type and the remaining 18 % were not able to identify their skin type on their own. The most common skin type of the participants was oily skin (30.98%), then combination skin (30.58%), followed by, normal skin (14.11%), dry skin (13.33%) and sensitive skin (10.98%). Consonance with the research studies done overseas, it has been found that the

most common skin type varies with the population. Considering the Asian region commonly having combination skin and oily skin [5],[7]. The research conducted as knowledge, attitudes and practices regarding skin care in Saudi Arabia concluded that the most common skin type of their respondents was combination skin (52.1%), then oily skin (24.8%), followed by dry skin (12.4 %). In that research, there were not any participants who identified their skin as normal skin and 10.7% of participants did not know to identify their skin type [4]. Furthermore, considering another research conducted in Thailand most of the participants identified their skin as oily skin (39.0%), followed by normal skin 37.5% and dry skin 9.2%. That research also mentioned the participants (14.2%) who do not know how to identify their skin type [5].

By evaluating the factors which are considered when purchasing a facial skincare product found out that, participants were considering a combination of factors when purchasing a product. Among the factors most priority factor was skin type 75.68%, then ingredients included in the product 74.50% could be taken as important. The least considerate factor was containers which contain the product (25.09%). There was research conducted in Andhra Pradesh, India as A study on knowledge, attitude and practice of using cosmetics among university students, that concluded that participants mostly considered the features of the product (53.0%), then packaging and appearance (24%). Followed by a price of 18.3%. The advertisements were taken as the least considerate factor (4.7%) [7].

While sun exposure is essential for the synthesis of vitamin D, prolonged exposure to UV rays may promote premature ageing, trigger the production of reactive oxygen species, cause skin cancer, and degrade extracellular matrix components such as collagen type I, fibronectin, elastin, and proteoglycans [8]. Applying sunscreen to exposed skin areas may aid in shielding the skin from damaging UV radiation. Hence, nowadays there is a wide popularity of sunscreen cosmetic products due to extra health advantages apart from beautification [9]. Because of the importance of sunscreen products in a skincare routine, this study evaluated the knowledge of sunscreen also. The ratio of the minimum UV energy needed to cause minimal erythema on sunscreen-protected skin to the UV energy needed to cause the same erythema on unprotected skin is known as the sun protection factor, or SPF [10]. As Sri Lanka is a country near the equator, it has a high UV index and it is recommended SPF of 30+ sunscreen is suitable for Sri Lanka [11]. However, the majority of the participants (44%) mentioned that they do not know the correct sun protection factor which is ideal for weather in Sri Lanka. Only 14.11% of participants mentioned the appropriate SPF value relevant to Sri Lanka.

Considering the research conducted in Thailand, the highest number of participants were not knowing the correct sun protection factor (31.9%) [5]. Considering the research conducted in Saudi Arabia, most of the participants marked their appropriate sun protection factor as 18 to below 30 (54.8%) [4].

By U.S. FDA standards, sunscreen should be administered before 30 minutes to maximize its benefits. After that, the skin has time to absorb the substance. It is crucial to reapply sunscreen after 30 minutes to ensure that the skin has an appropriate layer of protection. Interestingly, the majority of participants (56.07%) were aware of the appropriate time for application of sunscreen.

By evaluating the attitudes of the participants identified that most of the participants prefer to use natural skin care products (90.59%). Considering the research conducted in India that factor can be taken as a confirmation due to their participants also mostly preferred to use ayurvedic skin care products (45.3%), then cosmetic products contain medicinal value (27.0%), followed by organic cosmetics (24.0%) and chemical containing cosmetic products (3.7%) [7].

Regarding the evaluation of the reason for using facial skin care products, participants tend to mark a combination of responses. Among them, they mostly preferred skin care products to improve the healthiness of skin 76.0%. When compared to the research conducted in India, they mostly use cosmetics as protection for the skin (40.0%) [7]. The research conducted in Thailand mentioned

that they mostly use skin care products to cure acne symptoms 65.8% [5].

Regarding the practices, most of the participants (67.06%) are selecting the skin care products according to their skin type rather than considering other factors. According to the results of usage of bleaching products least count of participants used them intentionally or unintentionally (17%). Considering the research conducted in other countries they were more into using of bleaching and skin-lightening agents. The research conducted in Pakistan stated that 59% of participants tended to use skin-lightening agents [12]. The research conducted in Malaysia concluded that 60% of participants tend to use skin-lightening agents [13].

CONCLUSION

The current study investigated the knowledge, attitudes, and practices on facial skin care routines in undergraduates of universities and higher educational institutes in the Western province, of Sri Lanka, with the ultimate aim of uplifting consumer safety and improving the awareness of facial skincare routines. The results conclude that the majority of participants lacked the necessary understanding regarding facial skincare routines and SPF value. The analyzed data clearly showed that more than 90% of participants preferred natural products rather than synthetic products. Based on the survey results, the majority of participants were purchasing skin care products according to their skin type. In conclusion, the knowledge, attitude, and practices of facial skincare behaviour in undergraduates of universities and higher educational institutes in the Western Province, Sri Lanka was at an average lower level than expected.

Improving the knowledge, attitudes and practices on facial skincare is a crucial factor. Therefore, it is important to educate and provide sufficient knowledge and practices to the public. Furthermore, it is recommended to carry out a research survey to analyse the knowledge, attitudes and practices among other age groups and other educational level participants.

DECLARATIONS

A. Study Limitation

This study was limited to 255 undergraduates in universities and higher educational institutes in Western Province, Sri Lanka. Moreover, self-reported answers were vulnerable to biases and errors in reporting, which might lead to an overabundance or underabundance of information because of misinterpreted questions.

B. Acknowledgements

The authors would like to thank all participants who had volunteered for the study.

C. Funding source if any

None.

D. Conflict of Interests

No conflict of interest exists in this publication.

E. Ethical Approval

This study was reviewed and approved by the Ethics Review Committee of CINEC Campus, Malabe, Sri Lanka.

F. Informed Consent

Informed consent which was approved by the Ethics Review Committee of CINEC Campus, Malabe, Sri Lanka was shared with the participants before the questionnaire.

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