ORIGINAL ARTICLE

تقييم وضعيةعلم و عمل إستعمال مستحضرات ضد الشمس والمستحضرات المرطبه لدى الصيدلانيون في مدينه مشهد

التمهيد و الهدف: في العصر الحاضر قد ثبت من جهة العلميه لزوم إستعمال مستحضرات ضد شمس، لتفادى مضرات أشعة الشمس. و ايضاً يوصى الأطباء بإستخدام مستحضرات مرطبة لأجل محافظة على الجلد. أن الهدف هذه المطالعه هو مستوى المعرفة لدى صانعوا المستحضرات في مدينة مشهد تجاه صناعة مستحضرات ضد الشمس والمستحضرات المرطبه.

أسلوب: قد تم تكميل أستمارات من قبل ٨٠ صيدلاني في خصوص مستوى المعرفه و العمل، تجاه مستحضرات ضد الشمس والمستحضرات المرطبه في الشهر الثاني و الرابع من سنة ١٣٨٨ هجرى شمسي. كانت تشتمل هذه الأستمارا على ٢٥ سوال في مجال الخصوصيات الفرديه و العلم و العمل تجاه أستعمال مثل هذه المستحضرات. لقد تم في هذه المطالعه تحليل العوامل الموثره في هذه المطالعة.

النتائج: إن النساء الصيدلانيات كان يستعملون هذه المستحضرات أكثرمن الرجال الصيدلانيون. لم يكن هناك اختلاف ذوقيم في مستوى المعرفه بين الأناث و الذكور (أقل من ٥٠٪). اعلى مستوى من المرفه كانت لدى الشباب ذو سابقة عمل بين ٦ الى ١٠ سنة. كان مستوى المعلومات الجزئيه تجاه تركيبات هذه المستحضرات متدنى جداً (أقل من ١٠٪).

الأستنتاج: نظرإلى أن عدد كبيرمن الصيدلانيون لم يكن لديهم معلومات كافيه في خصوص مستحضرات ضد الشمس والمستحضرات المرطبه من الضروري أن يتم أعطاء تعليمات أفضل إلى طلاب الصيدله و ايضاً الصيدلانيون العاملون بعد نهايته الدراستهم.

الكلمات الرئيسيه: العلم، الصيدلانيون، ضد الشمس، المرطبات، الأسلوب التحضيرى.

The behavior and Knowledge of Pharmacists regarding the Application of Sunscreens and Moisturizers in Mashad, Iran

Background: Sunscreen usage is a widely accepted method of primary prevention against deleterious effects of UV radiation. Also it has been known that moisturizers are useful for skin health care. Pharmacists are pivotal to advise sunscreens and moisturizers to consumers. The aim of this study is to assess the knowledge and behavior of pharmacists in regard to the application of these products in Mashad, Iran.

Methods: From May to July 2008, 76 pharmacists completed surveys by filling the questionnaire. In this descriptive study, 25 questions addressed to determine the demographic characteristics plus the knowledge of the pharmacists towards sunscreen and moisturizer application and their formulations. The factors influencing the knowledge were also evaluated.

Results: From the overall respondents women used sunscreens and moisturizers more often than men. The respondents generally performed very poorly on the knowledge test. Sex was not significantly associated with the knowledge. In almost all age groups the results showed that higher knowledge scores were associated with younger age. The results also indicated that the highest knowledge scores are in 6-10 year work history. The mean score of the knowledge in ingredients of the formulations received 8.38±6.49 out of 100 points. This study showed that higher knowledge scores in formulations were associated with having more knowledge.

Conclusions: A significant proportion of pharmacists do not have adequate knowledge concerning the sunscreens and moisturizers. These results indicate that more education in the case of cosmetics and toiletries field is necessary for pharmacists, specially the older ones.

Keywords: Pharmacists, Cosmetics, Knowledge

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رطوبت دہندہ کریموں اور سن اسکرین کے استعمال کے بارے میں دواسازوں (فارمیسسٹ) کی کارکردگي اور آگہی۔ یہ تحقیق مشہد میں انجام دی گئي تھی۔

بیک گراونڈ: آج کل لوگوں کو سن اسکرین اور رطوبت دہندہ کریموں کے استعمال کی ترغیب دلائي جارہی ہے تاکہ سورج کی مضر شعاعوں سے بچا جاسکے اور جلد کی حفاظت بھی ممکن ہوسکے ۔

روش : اسی دواساز ڈاکٹروں کو پچیس سوالوں پر مشتمل ایک سوالنامہ دیا گیا جس میں سن اسکرین اور رطوبت دہندہ کریموں کے استعمال کے تعلق سے ان کے رجحان ، آگہی اور فردی خصوصیات کے بارے میں سوالات تھے۔اس تحقیق میں نتائج پر موثر ہونے والے اسباب کا بھی جائزہ لیا گیا۔

نتیجے: دواساز خاتون ڈاکٹروں کا رجحان مرد دواساز ڈاکٹروں سے بہتر تھا اور خواتیں مردوں سے زیادہ ان کریموں کو استعمال کرتی تھیں۔ خواتیں ڈاکٹروں اور مرد ڈاکٹروں کے درمیاں آگہی اور واقفیت میں کوئي زیادہ فرق نہیں تھا۔ ان کریموں کے بارے میں سب سے زیادہ واقفیت جوان افراد کو تھی جو چھے سے دس سال کے تجربے کے حامل تھے، البتہ ان کریموں کے اجزا اور ترکیبات کے بارے میں واقفیت بہت کم تھی یعنی تقریبا دس فیصد۔

سفارشات : اس امرکے پیش نظر کہ دواساز ڈاکٹر سن اسکرین اور رطوبت دہندہ کریموں کے بارے میں کافی معلومات نہیں رکھتے ہیں لھذا فارمیسی کے طلباء کوبہتر تعلیم دی جائے اور دوا ساز ڈاکٹروں کو فارغ التحصیل ہونے کے بعدبھی معلومات فراہم کی جائیں۔

کلیدی الفاظ: دواساز، ڈاکٹر ، سن اسکرین اور رطوبت دہندہ ۔

ارزیابی رفتار و دانش داروسازان در استفاده از فرآورده های ضد آفتاب و مرطوب کننده در مشهد

زمینه و هدف: در حال حاضر لزوم استفاده از فرآورده های ضد آفتاب به منظور مقابله با مضرات نور خورشید به اثبات رسیده است. همچنین به منظور مراقبت از پوست استفاده از فرآورده های مرطوب کننده نیز توصیه می گردد. هدف از این مطالعه، ارزیابی آگاهی داروسازان شهر مشهد درباره فرآورده های ضد آفتاب و مرطوب کننده بود.

روش: در ماههای اردیبهشت و تیر ۱۳۸۸ تعداد ۷۶ دکتر داروسازپرسشنامه ای را در خصوص دانش و رفتار آنها در مورد فرآورده های ضد آفتاب و مرطوب کننده پر نمودند. این پرسشنامه شامل ۲۵ سوال در مورد خصوصیات فردی و دانش و رفتار آنها در مورد مصرف اینگونه فرآورده ها بود. در این مطالعه عوامل موثر بر روی نتایج مطالعه نیز بررسی شد.

یافته ها: خانمهای داروساز از آقایان داروساز، بیشتر فرآورده ها را استفاده می کردند. دانش افراد در بین دو جنس اختلاف معنی دار نداشت و کمتر از ۵۰٪ بود. بیشترین آگاهی را افراد جوانتر و با سابقه کاری ۶ تا ۱۰ سال داشتند. اطلاعات در خصوص اجزا فرآورده های ضد آفتاب و مرطوب کننده بسیار پایین و زیر ۱۰٪ به دست آمد.

نتیجه گیری: با توجه به اینکه تعداد زیادی از داروسازان اطلاعات کافی در خصوص فرآورده های ضد آفتاب و مرطوب کننده ندارند، نیاز به آموزش بهتر دانشجویان داروسازی و همچنین داروسازان بعد از فارغ التحصیلی می باشد.

واژه های کلیدی: دانش، داروسازان، ضد آفتاب، مرطوب کننده، فرمولاسیون

INTRODUCTION

Intermittent and intense sun exposure has been shown to increase the risk of melanoma and basal cell carcinoma, while chronic exposure to sun appears to influence squamous cell carcinoma [1, 2]. Experts hypothesize that 90% of the cases of nonmelanoma skin cancer (NMSC) and two-third of the cases of melanoma may attribute to excessive sunlight exposure [3, 4].

Solar radiation and ultraviolet radiation (UVR) in particular, are increasing worldwide with the thinning of the protective ozone layer. [3,5,6]. The increasing incidence of skin cancer during the past several decades may be due to over-exposure to sun as well as social, occupational, and lifestyle shifts in the US population. Recommendations for primary prevention of skin cancers include: avoid outdoor activities in the middle of the day (11 A.M. to 3 P.M.), when 75% of the sun's daily UVR are transmitted; use hats and clothing to protect sun exposure and use sunscreens with a sun protection factor (SPF) of 15 or greater on exposed skin [7]. Sunscreen usage is a widely accepted method of primary prevention against deleterious effects of UVR; skin cancer, sunburn, freckles and photo aging. However, studies have shown that rates of regular sunscreen use are very low, despite the evidence of the efficacy of sunscreen application [8]. Furthermore, it has been known for decades that moisturizers are useful for skin health care.

Pharmacists are pivotal to advise some drugs and cosmetics. A pharmacist has different functions; the pharmacist as a dispenser of drugs; the pharmacist as a drug consultant and the pharmacist as a 'substitute doctor'. In many parts of the world, because of doctor shortage, pharmacists may be the only providers of medical care available to people. The reasons for this deficiency may be not only the high cost for health care but also the long distances to be travelled. This implies that patients will consult the nearest pharmacy and ask for therapy they can afford, without prior medical consultation. It must be noted that usually pharmacists or pharmacy assistants who act as 'substitute doctors' are inadequately trained. The role of pharmacists differs in different countries but there are certain principles in all countries. Dispensing, preparing some drugs and advising the patients are key tasks of the pharmacists [9, 10].

As there are many sunscreens and moisturizers in pharmacies, it is necessary for pharmacists to know the proper and correct application of these topical products. In this study, an attempt was made to assess the needs of pharmacists to pass a course in a particular area-sunscreens and moisturizers.

Pharmacists can play an important role in sunscreen and moisturizer application by counseling their consumers on the safe, informed choices and effective use of these products. Since pharmacists are readily accessible to consumers at the point where they are making decisions about purchasing sunscreens and moisturizers, pharmacists are in a good position to provide consumers the appropriate information and choose the adequate product [11]. They can also advise medical colleagues, answer consumers' questions in regard to the application of sunscreens and moisturizers, as well as stock and dispense the products. There are no published studies, which assess pharmacists' knowledge about sunscreens and moisturizers in Iran or other countries. It is also important to know the role of the ingredient formulations of the products for pharmacists.

The aim of this study is to assess the knowledge and behavior of the pharmacists on application of sunscreens and moisturizers and their formulations in Mashad, Iran. The challenge of this study is to encourage such researches in other areas of Iran and other countries. The study aims at evaluating the current deficiencies of practical training, and steps to improve the system, then the specific objectives of this study are: (a) to evaluate the accuracy of pharmacists' knowledge about sunscreen and moisturizer application and their formulations, and (b) to determine the relationship between awareness, sex, age and work history of the pharmacists.

METHODS

In this study, the sample was randomly selected from a list of all private retail pharmacies in Mashad using a random systematic sampling method. Hospital pharmacies were excluded. A hundred of pharmacies, covering 17 % of all community pharmacies in Mashad, were visited. The face-to-face questionnaire was conducted with the pharmacists. The study has been conducted according to the Declaration of Helsinki, and the subjects have given the informed consent. Out of 100 eligible pharmacies, the pharmacists were asked whether they liked to participate in this study or not. 24 pharmacists refused to participate, leaving 76 left in our study. Each interview lasted 45–60 minutes.

The questionnaire consisted of 25 structured and both closed and open-ended questions prepared to determine the demographic characteristics plus the knowledge of the pharmacists towards sunscreens and moisturizers. The factors influencing their knowledge were evaluated. The questionnaire was validated by the experts from Pharmacy School of Mashad University of Medical sciences.

The first three questions of the questionnaire covered a description of the interviewed (age, sex, work history). The next 2 questions regarded the use of sunscreens and moisturizers by own pharmacists, while the next 20 questions were aimed to investigate the knowledge regarding sunscreen and moisturizers (accurate application of sunscreens and moisturizers and some information in the field of SPF, UVR, skin hydration, …) and some information of the ingredients in the formulations of sunscreens and moisturizers.

The interviews were done for 3 months, from May to July 2007, 09:00 A.M. to 01:00 P.M. and 04:00 P.M. to 08:00 P.M. The filled questionnaires were recorded in a database, and the data was analyzed.

All interviews were conducted by a trained interviewer. The data was checked and then coded for analysis by the first author. Information was collected on several demographic variables, including: sex, age, and work history. In order to substantiate the validity of the knowledge test, correlations were computed between the knowledge scale scores and other variables that were expected to be related to the knowledge. Participants were awarded one point for each question they answered correctly and zero for each wrong or uncertain response. Thus, the maximum score was 85. To determine the knowledge of sunscreen and moisturizer

application the population under the study had to describe SPF, UVR, harmful effects of sun exposure, skin hydration, and etc.

Statistical analysis

The data was subjected to descriptive and inference statistics. Results are shown as a Mean ± SD. For analyzing data used Pearson's chi-square, Pearson correlation coefficient, and independent t-tests by Statistical Package for Social Sciences (SPSS) software version 11.5 for Windows. The level of statistical significance was set at $p < 0.05$ (two-sided p-values).

RESULTS

Out of 76 participant pharmacists 36 (47.4%) were men aged 33.00 ±13.97 and 40 (52.6%) were women aged 36.25±11.69 .The median period of practicing as a pharmacist since graduation was 9 (5–14) years. They were interviewed to find out their knowledge and behavior on sunscreens and moisturizers. When they were asked whether the sunscreens had been used by them, 55 (68.8%) had used sunscreens. 10 (12.5%) had used the sunscreens in the correct time (every 2 or 3 hours), 21 (26.3%) just in the morning and at noon and 23 (28.8 %) in other times, while 25 (31.2%) had used no sunscreens. 10 (12.5%) had used the sunscreens just in summers, 8 (10.0%) sometimes and 31 (38.8%) in all seasons and 6 (7.5%) gave no answer. 54 (67.5%) knew the correct application time of the sunscreens, 21 (26.3%) defined incorrectly and 5 (6.3%) gave no answer. 12 (15%) knew the SPF (Sun Protection Factor) definition perfectly, 10 (12.5%) answered incorrectly, 43 (53.8%) answered incompletely and 15 (18.8%) gave no answer. 54 (67.5%) knew the correct application of sunscreens, 21 (26.3%) didn't know and 5 (6.3%) gave no answer. Females 40 (72.7%) used sunscreen significantly more often than males 15 (27.3%) with $p<0.001$. In the case of the moisturizers, 54 (67.5%) had used moisturizers. 10 (12.5%) once a day and 44 (55.0%) sometimes while 26 (32.5%) had used no moisturizers. 36 females (66.7%) used moisturizers significantly more often than males 18 (33.3%). In response to this question "Does the oily skin need a moisturizer?" less than 50% answered correctly and others gave no response or answered wrongly. Generally, the respondents in this study performed very poorly on the knowledge test. The mean score received, 34.71±12.84 out of 100 points, which is less than 50%. Sex was not significantly associated with the knowledge ($p=0.18$). This is shown in Table 1.

In almost all age groups the results showed that higher knowledge scores were associated with younger age ($p=0.018$). The highest knowledge scores were observed among 30-39 years old participants. The results also indicated that the highest knowledge scores are among 6-10 year work history. The mean score of the knowledge in ingredients of the formulations received 8.38±6.49 out of 100 points. This is shown in Table 2. This study showed that higher knowledge scores in formulations were associated with more knowledge ($r=0.801$, $p<0.001$).

The above results show that high scores on the knowledge test characterize less work experience and less age with no relation to sex. These results indicate that more education in the cosmetics and toiletries field is necessary for pharmacists, especially the older ones. Informal discussion with the pharmacists after completing the questionnaire indicated that they are not confident in introducing the specific product to the consumers.

Table 1. The knowledge scores of pharmacists according to the sex and age groups (n=76)

SEX / Age Groups (Years old)	Mean (SD)	N
Woman Less than 30	35.58 (10.24)	12
30-39	42.33 (8.96)	15
40-49	31.40 (14.24)	10
50 and more	24.66 (4.04)	3
Total	36.25 (11.69)	40
Man Less than 30	39.00 (1.41)	2
30-39	37.00 (18.32)	13
40-49	30.60 (10.29)	10
50 and more	29.36 (11.68)	11
Total	33.00 (13.97)	36
Total Less than 30	36.07 (9.51)	14
30-39	39.85 (14.08)	28
40-49	31.00 (12.10)	20
50 and more	28.35 (10.55)	14
Total	34.71 (12.84)	76

* scoves are calculated out of 100 points

DISCUSSION

This is the first study that evaluates the knowledge and behavior of the pharmacists in regard to the application of sunscreens and moisturizers and their formulations. This study also indicates the relationship between awareness, sex, age, and work history of pharmacies.

Within the retail pharmacies, the role of the pharmacist as a health professional is not fully developed and s/he is sometimes considered as a simple trader [12].

From 100 eligible pharmacies, 24 refused to participate. The reason may be misunderstanding, lack of interest, confidence or waste of time.

The most important finding from this investigation is that among these pharmacists in Mashad, the mean score of awareness regarding to sunscreens and moisturizers was less than 50 out of 100 points and the mean score of the knowledge in ingredients of the formulations was less than 10 out of 100 points. The results indicate that the majority of the pharmacists in Mashad have insufficient knowledge about the sunscreens and moisturizers and their formulations. These results indicate that pharmaceutical education must be adjusted applying the principles of sunscreens and moisturizers and their formulations. Therefore, it is important to add courses enriched with the scientific knowledge based on sunscreens and moisturizers, which will improve good and accurate consumption of their consumers.

On the other hand, the Pharmacists can play an important

Table 2 The knowledge scores and the knowledge in ingredients of the formulations of pharmacists according to the work history* (n=76)

Work history (Year)	Number	The knowledge scores Mean (SD)	95% Confidence Interval for Mean		The knowledge scores in ingredients of the formulations Mean (SD)	95% Confidence Interval for Mean	
			Upper Bound	Lower Bound		Upper Bound	Lower Bound
5 or less	19	36.00 (11.94)	41.75	30.24	10.21 (6.86)	13.52	6.90
6-10	22	40.68 (14.39)	47.06	34.29	10.72 (6.28)	13.51	7.93
11-15	9	38.66 (8.51)	45.21	32.12	6.88 (5.66)	11.24	2.53
15-20	9	25.66 (8.51)	32.21	19.12	3.66 (4.25)	7.14	0.18
21-30	8	28.75 (10.43)	37.46	20.03	7.25 (7.00)	13.10	1.39
30 or more	9	27.77 (11.82)	36.87	18.68	6.00 (5.65)	10.34	1.65
Total	76	34.71 (12.84)	37.64	31.77	8.38 (6.49)	9.86	6.89

* scoves are calculated out of 100 points

role in satisfying patient demands for specialized information about their medications and products (13).

The knowledge of pharmacists in other fields such as; pharmacovigilance (14), alcohol and drug interactions (15), pharmacists' emergency contraceptive pills (16, 17) was established by other articles.

In t developing countries, patients prefer to consult the pharmacists first about suspected reactions to the drugs; since the pharmacists are free healthcare consultants and they are easily accessed. Therefore, pharmacists need to be actively involved in the surveillance of drug safety issues within the context of their practices [9]. Another research showed that most of the patients felt that financial constraints were the main reason for them approaching the pharmacist for advice (18). Other studies have shown that the reason to approach the patient to the pharmacist for advising instead of a doctor was that there is no need to bother the doctor appointment (19), and then the pharmacists' knowledge is important to investigate.

The most important limitations in this study are; the small-sized sample at a single site and some questions with no answer which cannot reflect the awareness of pharmacists in general. The knowledge of pharmacists varied somewhat from region to region, even when demographic differences were controlled the training and practice of pharmacy varies considerably from one province to the next [15]. The knowledge scores of pharmacists also varied greatly according to work setting.

Our survey showed that more than 50% knew the correct application of sunscreens; others didn't know how to use or gave no answer. More than 50% of the pharmacists had used sunscreens but less than 20% had used the sunscreens in the correct time. In the case of moisturizers, more than 50% had used moisturizers themselves. These results show that there is an important difference between knowledge and behavior. One does not automatically influence the other. When the subjects were asked whether the sunscreens were used by themselves, 68.8% had used sunscreens. In the white population of the U.S. this was reported 32%. There is no evidence of using sunscreens among the pharmacists in other areas but in adolescents in southeastern U.S., during the summer 17.4% used no sunscreen, 43.1% used sunscreen 25% of the time, 16.4% used sunscreen 50% of the time, 17% used sunscreen 75% of the time, and 6% used sunscreen 100% of the time [20].

The data was based on several demographic variables, including: sex, age, and work history. In order to substantiate the validity of the knowledge test, correlations were computed between the knowledge scale scores and other variables related to this knowledge. Further research is needed to reveal the factors that influence pharmacists' knowledge about sunscreens and moisturizers aspects.

It is also likely that their knowledge differs in relation to the age and work experience. The results showed that higher knowledge scores were associated with younger age and less work history. This is probably because it is relatively a short time since they are graduated. These results indicate that more continuous education programs and courses in the cosmetic and toiletry field are necessary for pharmacists after graduation especially older ones. Moreover, such researches would be enabled to identify the topic areas that pharmacists require for training.

The highest knowledge scores were observed among 30-39 year old participants. The results also indicated that the highest knowledge scores are in 6-10 year work experience. This can be described as it has not been taken so long from their education and also they have had enough time for earning some experiences.

Our findings show pharmacists with more knowledge are able to inform their clients easier. These findings are previously supported by Toklu [14] indicating a relationship between pharmacists' knowledge and drug consultation

behaviors.

Less than 10% of the respondents were aware of the ingredients and formulation of sunscreens and moisturizers with no difference in awareness between male and female pharmacists. This means that the knowledge of the ingredients is very poor among pharmacists. As the pharmacists in local pharmacies, do not commonly encounter this kind of information, this can make it difficult for them to develop their skills and leads to losing their knowledge during the time.

This meant their reluctance to advise the use of sunscreens and moisturizers to their consumers. The results of this study indicate that pharmacists' awareness is really poor in this area.

The findings of this survey show that a significant number of pharmacists in Mashad having inadequate knowledge about the sunscreens and moisturizers.

It is hoped that better educating of pharmacists about the sunscreen and moisturizer application and ingredients will help the general population better.

The results showed that high scores of the knowledge test involve less work history and less age, with no relation to sex. These results indicate that more education in the cosmetics and toiletries field is necessary for most of the pharmacists, especially the older ones.

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