

# Skin diseases seen in kampus community Health Center of Selçuk University in two year period: an educational perspective

Nazan Karaoğlu\*, Fatma Deniz\*\*, İnci Mevlitoğlu\*\*

\*Selçuk University, Medical Faculty of Meram, Department of Medical Education and Informatics, Konya, Turkey

\*\*Selçuk University, Medical Faculty of Meram, Department of Dermatology, Konya, Turkey

## Özet

### Selçuk Üniversitesi Kampüs Sağlık Merkezinde iki yıllık bir süreçte görülen deri hastalıkları: Eğitimsel bir perspektif

**Amaç:** Bütüncül sağlık yaklaşımı ile sağlık hizmetleri hızla değişirken, günlük pratiklerinde deri şikayetleri ile gelen birçok hasta gören birinci basamak hekimlerinin sık görülen deri hastalıklarının bakımını üstlenebilmesi için bu konudaki pratik bilgilerini artırmaları gereklidir. Bu çalışmanın amacı, birinci basamak bir sağlık kuruluşu olan Kampüs Sağlık Merkezi'nde sık karşılaşılan deri hastalıklarını belirleyerek tıp eğitimine ışık tutabilmektir. **Hastalar ve Metotlar:** Bu tanımlayıcı çalışmada, Selçuk Üniversitesi Kampüs Sağlık Merkezi'ndeki dermatoloji polikliniğinin geriye dönük olarak hasta dosyaları taranmıştır. Kayıtlardaki demografik bilgiler, tanılar, verilen tedaviler veya dermatoloji kliniğine sevkler kaydedilmiştir. **Bulgular:** Çalışma grubunun yaş ortalaması 24,53±8,74 (min:1, max:72) yıldır. Toplam 60 deri problemi saptanmıştır. En sık deri problemi akne vulgaristir (%41,6). İkinci ve üçüncü sıklıkta görülen deri hastalıkları grubu alerjik-pruritik hastalıklar ve mantar enfeksiyonlarıdır (%17,6, %9,6). Hastaların %87,8'ine tedavi verilmiştir. **Sonuç:** Hasta kayıtlarının daha düzgün tutulması halen aile hekimi olan veya ileride aile hekimi olacak olan hekimlerin eğitiminde pratik performanslarının ve rollerinin artırılması açısından değerlidir. Birinci basamak hekimlerinin eğitimi en sık görülen cilt hastalıklarının ve bu hekimlerin deri hastalıkları ile baş etmedeki zorluklarının tanınmasını kapsamalıdır.

**Anahtar kelimeler:** Tıp eğitimi, deri hastalıkları, birinci basamak.

## Abstract

**Introduction:** As health care delivery under managed care is rapidly changing, primary care physicians (PCPs) who frequently see patients with skin disease in their practice should have the practicing knowledge to handle the most common skin diseases in order to manage of those cases. This study aims to determine the most common dermatologic diseases in primary care and to shed light on medical education. **Patients and Methods:** In this descriptive study, a retrospective chart review was performed in Campus Health Center of Selçuk University. Demographic data, diagnosis, laboratory tests, treatments or referrals to dermatology clinic were noted. **Results:** The mean age of the study population was 24.53±8.74 (min=1, max=72) years. A total of 60 skin problems were identified. The most common dermatologic problem was acne vulgaris (41.6%). Allergic-pruritic diseases and fungal infections were the second and the third main dermatologic diseases seen in 17.6% and 9.6% of the patients, respectively. Treatment was given to 87.8% of the patients. **Conclusion:** An improved record of patients will be valuable for the training of current and future family physicians in order to increase their practical performance and enhance their roles. Education of PCPs should include a definition of the most common diseases and their limitations in dealing with skin problems.

**Key words:** Medical education, skin diseases, primary care.

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**Corresponding address:** Yrd Doç Dr Nazan Karaoğlu  
Selçuk Üniversitesi Meram Tıp Fakültesi, Tıp Eğitimi ve Bilişim  
Anabilim Dalı (TEBAD) Akyokuş, 42080, Konya.  
Tel: 0-533-6605706  
E-mail: drnkaraoglu@yahoo.com.tr

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## Introduction

Primary healthcare services are designed to serve as the front-line and mainstay of health services to meet the continuum of healthcare needs of a community (1-3). In recent years, by managed care, countries are planning to reduce the costs of health care delivery. As health care delivery under managed care is rapidly changing, there may have been changes in the frequency of dermatologic care offered by non-dermatologists (4-6). They attempt to do this by encouraging patients' primary care providers to provide a great amount and wider spectrum of patient care (4,7-19). Although they are the main actors of this system, primary care physicians (PCPs) have a difficult role to play within the managed care system (4,13,14,20,21). Primary care providers do frequently see patients with skin disease in their practice. More than one third (36.5%) of the patients attended to PCPs had at least one skin problem and for more than half (58.7%) of these patients it was their main complaint (7). This, in turn, mediates the link between primary care and dermatology. Although approximately 10% of all outpatient visits are for dermatologic conditions, the average dermatology requirement in the US medical schools is just 21 hours (4,8,22). In Turkey, medical students make a three week rotation in dermatology clinic in the fifth year of their education in most of the medical faculties. It is same at Selçuk University where this study was undertaken.

As some authors suggest, these physicians, however, treat few cases of individual skin conditions. A large percentage of the patients is referred to dermatologists, often for a biopsy of a suspected lesion, to confirm diagnosis, or to establish a diagnosis of lesions of unknown origin (4,6,7,20,23). Furthermore, because of economic factors, solutions of health care system are awaited from primary care physicians even from nurses (5,24). Primary care physicians should have the practicing knowledge to handle the most common skin diseases in order to facilitate the management of common dermatological problems and to recognize those cases that require further referral. This is expected to decrease the rate of hospital visits and reduce costs (10,25,26).

The frequency of patients attending to primary care physicians with skin disease and their eventual disposition is not well recorded in Turkey. It is believed that an improved record of patients will be available with the recent introduction of family physicians into the healthcare system. This

information is valuable for the training of current and future family physicians in order to increase their practical performance and enhance and maximize their roles (1,27). Education of PCPs should include a definition of the most common diseases and their limitations in dealing with skin problems (26,28). The aim of this study was to determine the most common dermatologic diseases in primary care and to shed light on medical education for both undergraduates and postgraduates who will work and who is working as family physicians, respectively.

## Patients And Methods:

In this descriptive study, a retrospective chart review was performed in Campus Health Center of Selçuk University. The study site is a primary care setting which is serving students and personnel of the university. Approximately 33000 patients are examined each year by primary care physicians at this center. Trainees of different branches (internal medicine, dermatology, pediatric etc.) give medical care to the patients according to a schedule in the center. Specifically, medical records of patients who referred to this center primarily for skin diseases were reviewed for the two year period, from 04.01.2005 to 15.12.2006. Age, gender and being student or personnel were obtained as demographic data because only these variables had been completely noted in the charts. The diagnosis, laboratory tests, treatments or referrals to dermatology clinic were noted. In this study, patients with primary dermatologic complaints were examined by a trainee of dermatology so that the common skin disorders were easily identified. Examination directly by a dermatology trainee was also an advantage about diagnosis. Due to the wide range of diagnosis skin diseases were classified in 10 main groups (acne vulgaris, allergic-pruritic diseases, erytemato-papulosquamos diseases, fungal infections, viral infections, pigmentation disorders, parasitic infections, hair diseases, bacterial infections and others). Descriptive statistics included means and standard deviations for continuous variables and percentages for categorical variables. Categorical variables were compared using Pearson Chi-square. All tests were two tailed, and a p value less than .05 was considered significant. Statistical analyses were performed using SPSS version 13.0 package software.

## Results

There were 1483 patients who had a dermatologic problem as their main complaint in this primary care unit of Selçuk University during 04.01.2005–15.12.2006 period. Eighty of the patients were eliminated because of their incomplete medical records. The mean age of the study population was  $24.53 \pm 8.74$  (min=1, max=72) years. University students constituted the majority of the group with 68.7% (n=964). Table 1 shows the main characteristics of the patients.

Table 1. Characteristics of patients issued in the study in respect to age, gender and status.

Characteristics of patients	Number of patients	Percentage (%)	Mean age (year)± Standard Deviation
<b>Age</b>			24.53±8.74
1-25	1031	73.5	
≥ 26	372	26.5	
<b>Gender</b>			
Male	611	43.5	26.24±10.17
Female	792	56.5	23.22±7.19
<b>Status</b>			
Student	964	68.7	21.68±2.21
Personnel	439	31.3	30.79±13.29
<b>TOTAL</b>	1403	100.0	

A total of 60 skin problems were identified. The most common dermatologic problem was acne vulgaris with a percentage of 41.6% (n=583). Allergic-pruritic diseases followed acnes by 17.6% (n=246). Fungal infections were the third common type of skin diseases (9.6%, n=135). All skin diseases which were recorded during this two year period are presented in Table 2 with a classification of diseases. According to the classification, acne vulgaris and allergic-pruritic diseases were the main skin diseases seen in 41.6% and 17.6% of the patients, respectively. According to age groups comparisons while acne vulgaris was significantly more common in patients younger than 26 years old ( $p=0.000$ ), allergic-pruritic diseases, erythematopapulosquamous diseases, fungal infections, bacterial infections and other skin diseases were more significant in older ones ( $p<0.05$ ). Table 3 shows the distribution of skin diseases according to age groups and comparison of them with Pearson Chi-square.

Treatment was given to 87.8% (n=1232) of the patients while the rate of referral to a dermatology clinic for advanced investigation was 7.4% (n=104).

## Discussion

Why was the present study designed in a Health Center, a primary care unit of a University? Beside the limitation of the study population in terms of consisting mainly university students, it gave us some advantages over the university hospital as: 1-it serves as a primary care unit of a university hospital, 2- GPs and experienced trainees of dermatology serve in this unit. Thus, it wasn't necessary to confirm the dermatologic diagnosis by a dermatologist. 3- It was more accessible than the dermatology clinic of university, 4- the main admission complaint was a dermatologic complaint but there is no reason to believe that this had a major influence on the results, especially when the first aim was to determine the most common skin diseases in primary care and to discuss its importance in medical education. Consistent with previous findings the age distribution of the patients was young and the ratio of male to female patients was 1 to 1.29 in this study (10). Acne vulgaris and allergic-pruritic diseases were the main skin diseases seen in 41.6% and 17.6% of the patients, respectively (Table 2). One possible explanation for the high percentage of acne vulgaris could be the age distribution of the group. However, acne was noted among the most common dermatologic diseases in the visits of dermatologists and family physicians before (4). Eczemas by 15.8% and seborrheic eczemas as the most common type of eczemas by 4.6% were similar to the previous studies in which they were mentioned as the most common diagnosed skin lesions (4,19,29). Some others also noted that allergic and infectious skin diseases were the most common cutaneous diseases in patients attending to a tertiary University hospital (10).

PCPs today play a major role in making clinical decision with regard to cutaneous diseases (25). According to some studies, family physicians spent 6.2% of their outpatient time on visits for dermatologic diagnosis and 36.5% of patients who attended to their primary care physician had at least one skin problem in 58.7% which was their chief complaint (4,7). In the present study, the study population just consisted of patients with primarily dermatologic complaints even with referral or not but because of the incomplete information in medical records it wasn't possible to calculate the percentage of dermatologic diseases in the whole out-patient policlinics of the Campus Health Center.

Table 2. All skin diseases which were seen in two year period in Campus Health Center and the classification of them with number of patients and percentages.

Classification	n	%	Classification	n	%
<b>Acne Vulgaris</b>			<b>Allergic-Pruritic Diseases</b>		
Acne vulgaris	583	41.6	Chronic eczema	64	4.6
			Contact dermatitis	49	3.5
			Atopic dermatitis	44	3.1
			Urticaria	28	2.0
			Norodermatitis	19	1.4
			Pruritus	19	1.4
			PLE	10	0.7
			Drug reaction	7	0.5
			Perioral dermatit	6	0.4
<b>TOTAL</b>	<b>583</b>	<b>41.6</b>	<b>TOTAL</b>	<b>246</b>	<b>17.6</b>
<b>Erythematopapulosquamous Diseases</b>			<b>Fungal Infections</b>		
Seborrheic dermatitis	65	4.6	Tinea pedis	58	4.1
Psoriasis	11	0.8	Pityriasis versicolor	42	3.0
Pityriasis rosea	9	0.6	Onychomycosis	20	1.4
Hailey-Hailey disease	2	0.1	Tinea inguinalis	12	0.9
Pemphigus	1	0.07	Tinea alba	3	0.2
<b>TOTAL</b>	<b>88</b>	<b>6.2</b>	<b>TOTAL</b>	<b>135</b>	<b>9.6</b>
<b>Viral Infections</b>			<b>Pigmentation Disorders</b>		
Verruca vulgaris	59	4.2	Vitiligo	12	0.9
Herpes simplex	8	0.6	Melasma	8	0.6
Herpes zoster	6	0.4	Postinflammatory hyperpigmentation	4	0.3
			Efelid	2	0.1
<b>TOTAL</b>	<b>73</b>	<b>5.2</b>	<b>TOTAL</b>	<b>26</b>	<b>1.9</b>
<b>Parasitic Infections</b>			<b>Hair Diseases</b>		
Insect bite	19	1.4	Alopecia areata	24	1.7
Scabies	2	0.1	Hirsutism	19	1.4
Pediculosis capitis	2	0.1	Alopecia diffusa	14	1.0
			Androgenic alopecia	6	0.4
<b>TOTAL</b>	<b>23</b>	<b>1.6</b>	<b>TOTAL</b>	<b>63</b>	<b>4.5</b>
<b>Bacterial Infections</b>			<b>Others</b>		
Folliculitis	36	2.6	Xerosis	18	1.3
Pyoderma	7	0.5	Hyperhidrosis	11	0.8
Furunculosis	6	0.4	Nevus (moles)	10	0.7
Intertrigo	4	0.3	Keloid	10	0.7
Paronychia	2	0.1	Callus	10	0.7
Impetigo	1	0.07	Acne rosacea	9	0.6
			Tumors	6	0.4
			RAS	5	0.4
			Miliaria	5	0.4
			Lichen planus	5	0.4
			Behçet Disease	4	0.3
			Stria	4	0.3
			Nail Disorders	4	0.3
			Burns	3	0.2
			Erythema nodosum	1	0.07
			Morphea	1	0.07
			Dermal atrophy	1	0.07
			Perleche	1	0.07
			Molluscum	1	0.07
			Telangiectasia	1	0.07
<b>TOTAL</b>	<b>56</b>	<b>4.0</b>	<b>TOTAL</b>	<b>110</b>	<b>7.8</b>

As a primary care strategy that may be effective for managed care systems would be to target a limited number of common skin conditions for primary care physicians to treat beyond use of dermatologists for treating skin diseases (4). A GP should be able to diagnose, assess and manage patients with common skin diseases (16). A previous study suggested that according to the specific training in dermatology in basic medical school, the overall performance of

PCPs in dermatology practice, especially the ability to diagnose common diseases than rare dermatoses was significantly different compared to those who did not. They also noted that this emphasis the importance of teaching PCPs the ability of recognizing common and serious dermatoses (26). The teaching of medical undergraduates and PCPs should focus on the investigation and good management of these leading diseases if complications are to be prevented

Table 3. Comparison of the classified skin diseases according to age groups.

	Age (year)				p**	Total	
	1-25		≥26			N	%*
	N	%*	N	%*			
Acne Vulgaris	526	51.0	57	15.3	<b>0.000</b>	583	41.6
Allergic-Pruritic Diseases	148	14.4	98	26.3	<b>0.000</b>	246	17.5
Erythemat-Papulosquamos Diseases	52	5.0	36	9.7	<b>0.002</b>	88	6.3
Fungal Infections	75	7.3	60	16.1	<b>0.000</b>	135	9.6
Viral Infections	55	5.3	18	4.8	0.712	73	5.2
Pigmentation Disorders	17	1.6	9	2.4	0.345	26	1.9
Parasitic Infections	17	1.6	6	1.6	0.963	23	1.6
Hair Diseases	47	4.6	16	4.3	0.837	63	4.5
Bacterial Infections	27	2.6	29	7.8	<b>0.000</b>	56	4.0
Others	67	6.5	43	11.6	<b>0.002</b>	110	7.8
<b>TOTAL</b>	<b>1031</b>	<b>100.0</b>	<b>372</b>	<b>100.0</b>		<b>1403</b>	<b>100.0</b>

\* Column percentage  
\*\* Pearson Chi-square.

and hospitalizations to be reduce (1,10). This, in fact, is important in patients' perspective. As may be seen in a previous study, patients may harbor positive feelings, in general, toward their PCP, who is involved in such broadly encompassing medical endeavors as chronic disease management, disease prevention, cancer screening, patient education, and overall coordination of care, and with whom patients have developed a longitudinal relation (13). Besides, a study has suggested that family physicians and general practitioners are superior to internists when tested on diagnostic abilities with respect to skin diseases (12).

In the research of Merenstein et al., the overall agreement in diagnosis and treatment between family physicians and dermatologists were found to be as 72% and 80%, respectively (19).

If a GP has uncertainty about the provisional or differential diagnoses, he or she is probably not in a position to pursue further and the patient is best referred to a dermatologist (20,23). As it was mentioned earlier, an important reason for referral was that physicians deemed the management of the health problem to be outside their scope of practice. Dermatology is among the most common specialties to which patients are referred by 6.0% (23). A large percentage is referred to dermatologists, often for a biopsy of a suspected lesion, to confirm a suspected diagnosis, or to establish a diagnosis of lesions of unknown origin (7). In the study of Symvoulakis et al., it was amazing that 85.0% of patients who were seen for skin complaints in emergency department of a tertiary hospital received hygienic and dietary advice with or without a prescription for drugs and 4.8% were admitted to the clinic for further diagnostic procedures and treatment (10). Their results were

similar to presented study with 87.8% prescribed and 7.4% referred to dermatology clinic. It also shows that most of the patients can be managed in primary care by adequate education.

Generally, poor performances of GPs in dermatology were attributed to inadequate dermatologic training in medical schools (12,15,21,25). In 1986, Ramsay and Weary surveyed US medical schools and found that the mean requirement for education in dermatology was 21 hours and most teaching was in the first two years of medical school, before student acquire experience with clinical medicine (21). Furthermore, that report found that only approximately one third of medical students were afforded opportunities to rotate through a clerkship in dermatology (21). This supports the idea of that dermatologist should raise the profile of the specialty in medical schools by participating in university committees and should grasp opportunities to contribute to innovative curricula (27). As it mentioned before, strengthening or improving the relationship between family physicians and dermatologists is an obligatory action. The dermatologist and the family physician attend the same patient and often treat the same condition. It is necessary to point out that, for the dermatologist, the family physician is a direct client who must be attended professionally and competently, since it is the family physician who decides how and to whom patients can be referred (17). Federman et al. took attention to the point that among the primary care specialties, family medicine physicians outperformed internal medicine physicians (12). They attributed this result partly to the broader training experience offered in family medicine residency programs or to

other factors occurring after residency training (eg, more hours of graduate training in dermatology or more postgraduate education). In another study it was mentioned that although dermatologists have both better diagnostic accuracy and ability to manage pigmented lesions than PCPs there is a shortage of dermatologists to meet the demand of accurate melanoma screening (11). Mahe et al. analyzed the registers of primary health care centers and it was found that the proportion of patients presented with skin diseases who benefited from a clear diagnosis and appropriate treatment increased from 42% before the training to 81% afterwards; this resulted in a 25% reduction in prescription costs (15). Although all the studies mentioned above are showing the importance and the necessity of dermatology education for both undergraduates and trainees of family medicine present state of medical faculties and family medicine residency program seem to be inadequate and there is a need to revise these education programs. However, this study has some limitations as well. First of all it is a retrospective study and secondly the level of knowledge of PCP's wasn't known since diagnoses were made by a trainee of dermatology. The results can not be generalized to the students of other faculties. Besides, the results of this study can't be a representative of general population. This study might thus be the first step for further investigations about skin diseases, primary care and the importance of the issues in medical education.

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### References

- 1- Emmanuel SC, Phua HP, Cheong PY. 2001 survey on primary medical care in Singapore. *Singapore Med J* 2004; 45(5): 199-213
- 2- Starfield B. Basic concepts in population health and health care. *J Epidemiol Commun H* 2001; 55: 452-4
- 3- Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q* 2005; 83(3): 457-502
- 4- Fleischer AB, Herbert CR, Feldman SR, O'Brien F. Diagnosis of skin disease by nondermatologists. *Am J Manag Care* 2000; 6: 1149-56
- 5- Courtenay M, Carey N, Burke J. Preparing nurses to prescribe medicines for patients with dermatological conditions. *J Adv Nurs* 2006; 55(6): 698-707
- 6- Gradwell C, Thomas KS, English JSC, Williams HC. A randomized controlled trial of nurse follow-up clinics: do they help patients and do they free up consultants' time? *Brit J Dermatol* 2002; 147: 513-7
- 7- Lowell BA, Froelich CW, Federman DG, Kirsner RS. Dermatology in primary care: Prevalence and patient disposition. *J Am Acad Dermatol* 2001; 45: 250-5
- 8- Clayton R, Perera R, Burge S. Defining the dermatological content of the undergraduate medical curriculum: a modified Delphi study. *Brit J Dermatol* 2006; 155: 137-44
- 9- Feldman SR, Ravis C, Moran WP, Fleischer AB. Patients seen in a dermatology clinic have unmet preventive health care needs. *J Am Acad Dermatol* 2001; 44: 706-9
- 10- Symvoulakis EK, Krasagakis K, Komninos ID, Kastrinakis I, Lyronis I, Philalithis A et al. Primary care and pattern of skin diseases in a mediterranean island. *BMC Fam Pract* 2006; 7: 6
- 11- Chen SC, Pennie ML, Kolm P, Warshaw EM, Weisberg EL, Brown KM et al. Diagnosis and managing cutaneous pigmented lesions: Primary care physicians versus dermatologists. *J Gen Intern Med* 2006; 21: 678-82
- 12- Federman DG, Concato J, Kirsner RS. Comparison of dermatological diagnoses by primary care practitioners and dermatologists. A review of the literature. *Arch Fam Med* 1999; 8: 170-2
- 13- Federman DG, Reid MC, Feldman SR, Greenhoe J, Kirsner RS. The primary care provider and the care of skin disease. The patient's perspective. *Arch Dermatol* 2001; 137: 25-9
- 14- Youl PH, Baade PD, Janda M, Del Mar CB, Whiteman DC, Aitken JF. Diagnosis skin cancer in primary care: how do mainstream general practitioners compare with primary care skin cancer clinic doctors? *MJA* 2007; 187: 215-20
- 15- Mahe A, Faye O, N'Diaye HT, Konare HD, Coulibaly I, Keita S et al. Integration of basic dermatological care into primary health care services in Mali. *Bull World Health Organ* 2005; 83(12): 935-41
- 16- Lawrence C. General practitioners with a special interest in dermatology-the dermatologist's perspective. *Clin Med* 2003; 3(5): 440-2
- 17- Borbujo J. Dermatology and primary health care: An obligatory relationship. *Actas Dermosifiliogr* 2007; 98: 159-63
- 18- Salisbury C, Noble A, Horrocks S, Crosby Z, Harrison V, Coast J et al. Evaluation of general practitioner with special interest service for dermatology: randomized controlled trial. *BMJ* 2005; 331: 1441-6
- 19- Merenstein D, Meyers D, Krist A, Delgado J, McCann J, Petterson S et al. How well do family physicians manage skin lesions? *J Fam Pract* 2007; 56(1): 40-5
- 20- Chuh AAT, Wong WCW, Wong SYS, Lee A. Procedures in primary care dermatology. *Aust Fam*

- Physician 2005; 34(5): 347- 51
- 21- Ramsay DL, Weary PE. Primary care in dermatology: Whose role should it be? J Am Acad Dermatol 1996; 35(6): 1006-9
  - 22- Feldman SR, Fleischer AB, McConnell RC. Most common dermatologic problems identified by internists, 1990-1994. Arch Intern Med 1998; 158:726-30
  - 23- Forrest CB, Nutting PA, Starfield B, Von Schrader S. Family physicians' referral decisions. J Fam Pract 2002; 51: 215-22
  - 24- Clark AR, Monroe JR, Feldman SR, Fleischer AB Jr, Hauser DA, Hinds MA. The emerging role of physician assistants in the delivery of dermatologic health care. 2000; 18(2): 297-302
  - 25- Whitaker-Worth DL, Susser WS, Grant-Kels JM. Clinical dermatologic education and the diagnostic acumen of medical students and primary care residents. Int J Dermatol 1998; 37(11): 855-9
  - 26- Al-Hoqail IA, Gad A, Crawford RI. Dermatology practice in primary health care services: where do we stand in the Middle East? Int J Dermatol 2001; 40: 4-7
  - 27- Burge S. Teaching dermatology to medical students: a survey of current practice in the U. K. Brit J Dermatol 2002; 146: 295-303
  - 28- Adıřen E, Unal S, Gurer MA. Dermatology consultations (in Turkish). Turkderm 2006; 40: 126-9
  - 29- Kaymak Y, Bakır B. The frequent skin diseases diagnosed at university students (in Turkish). TSK Koruyucu Hekimlik Bulteni 2005; 4(6): 313-20