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PREVALENCE OF SKIN DISEASE IN NINEVEH CITY, AN ITERVENTIONAL STUDY

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ABSTRACT

In Iraq the available measures of disease frequency related to skin disorders are from hospital-based clinic studies. It reflects the patterns of clinic attendance, and the actual prevalence of skin diseases in the community is unknown. The main objective of this study was to determine the prevalence of skin diseases in selected areas of Ninevah governorate. A household survey based on health interviews and clinical examination was conducted over a period of seven months. Family members of 1201 households were involved in the study through multi-stage cluster sampling of predetermined areas from the catchment areas of six primary health care centers in and around Mosul city. There were 9453 person residing in the 1201 households surveyed. The demographic characteristics of the studied sample were compatible to Iraqi population. 2779 cases were identified, of which 2% people could not be traced for clinical examination. 33% households did not have anyone with a skin lesion. The prevalence of skin diseases was (293.9‰). The commonest skin diseases were acne vulgaris (53.8‰), contact dermatitis (14.9‰), fissuring of sole (14.5‰), urticaria (12.5‰), pityriasis alba (12.3‰), seborrhoeic dermatitis (10.8‰), neavus (9.3‰), impetigo (8.0‰), tinea pedis (7.3‰), psoriasis (6.8‰). The overall prevalence rates of diseases in females (324.1‰) were higher than for males (265.1‰). Acne vulgaris and fissuring of sole have got higher rates in females than males. Pityriasis alba was higher among males. There was variation in the prevalence of many of skin diseases with age, the highest prevalence rates was among the 15-44 years age group (355.7‰). Napkin rash and seborrhoeic dermatitis have higher rate 28.5‰ in infants and in the 1-4 years age group. The prevalence rate of infectious dermatoses was higher in rural (114.4‰) than urban (64.0‰), for the educational level, graduates has the lowest prevalence rate of skin disease (127.3‰). Housewives and manual workers have high prevalence rate of eczema (4.7%, 5.9%) respectively. Animal contact and bad house hygienic condition decrease the chance of controlling infectious dermatoses group of skin diseases. Smoking and stress increase the prevalence rate of urticaria. Similar pattern of common dermatoses to this study was found in other developing countries. Aged people prefer self-remedy and traditional medicine (4.2%, 9.6%) respectively. High educational levels prefer the choice of dermatologist (65.3‰). This is the first community based survey of skin diseases in Ninevah, its results could be used as bases to plan interventions at community level. The overall prevalence of skin disease was high in the surveyed community. There were clear differences between community prevalence and hospital dermatology-clinic attendance data for a number of skin diseases.

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INTRODUCTION

Generally speaking, routinely published medical statistics on skin disorders are scanty, and when available, are of limited use to the dermatologists in describing the burden of skin diseases in the community. Special community-based surveys are usually the best to determine the prevalence and morbidity of diseases in general or specific skin diseases (Doll, 1987). Most routinely published morbidity data refer to those who seek medical help in the primary-care setting. With the exception of a few conditions such as cellulitis where incidence and demand are closely related, the extend to which routine morbidity data reflect the burden of dermatological need in the community is unclear (Williams, 1997). Despite these limitations, routine statistics such as the UK morbidity surveys from general practice (Royal College, 1995) are useful in that they provide an estimate of the magnitude and demographic determinant of those who seek medical care. Overall mortality is relatively low for skin diseases, accounting for 0.46% of deaths from all causes and all ages. Melanoma skin cancer alone accounted for a total of 1142 deaths in England and Wales in 1992, with 48% occurring in economically active adults (Office of population census and survey, 1994).

1.1. Impact of skin diseases on population:-

Consideration of the concepts of impairment, disability and handicap may be helpful in determining the burden on population through the following:

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Disfigurement: The presence of disfiguring skin lesions may distort the emotional development of a child, some become withdrawn other aggressive, but many adjust well. The range of individual reactions to skin disease is therefore wide at one end lies indifference to grossly disfiguring lesions and at the other lies an obsession with skin which is quite normal. Dysmorphophobia is the term applied to distortions of the body image, where no skin abnormality can be found by the clinician but the distress felt by the patient may lead to anxiety depression or even suicide. Such patients are reluctant to see a psychiatrist though some may suffer from a monosymptomatic hypochondriacal (Hunter, 1999).

Discomfort: Some people prefer pain to itch, skin diseases can offer both, itchy skin disorders such as in eczema, lichen planus, scabies and dermatitis herpitiformis, while pain is marked in shingles, leg ulcers and glomus tumours. Disability: At the most obvious level dermatitis of the hands can quickly destroy a manual worker's earning capacity as may hairdressers, nurses, cooks and mechanics know to their cost. In USA for example skin diseases account for almost half of all cases of occupational illness and cause more than 50 million days to be lost from work each year (Herd, 1996).

Depression: These physical, sensory and functional problems often lead to depression and anxiety, even in the most stable people.

Death: Death from skin disease is fortunately rare but does still occur, e.g. in pemphigus, toxic epidermal necrolysis and cutaneous malignancies (Williams, 1998).

1.2. Burden of skin diseases on the community:

It is true that epidemiology is often used to describe the burden of skin diseases in human population, as Doll (1987), points out. Epidemiology offers one of the most powerful and direct methods of evaluating the causes of skin diseases in human populations. The concept of considering the health of entire populations also applies to the classification of skin diseases. Such distinctions often become blurred when community surveys are undertaken. Handicap in skin disease may not be so explicit as that associated with other diseases, while relatively minor skin complaints often cause more anguish to people than other more serious medical problem (Ryan, 1991). One population-bases, cross-sectional study conducted in the USA on a random sample of 20479 people examined by dermatologists showed that skin disorders were reported to limit activity in 10.5 per 1000 of population aged 1-74 years. About 10% of those persons with skin disorders considered to be handicaps and about one third of those persons with skin disorders indicated that the conditions were handicap in their social relations. More than half of those persons with skin complaints reported some discomfort such as itching or burning. An estimated 56% of skin complaints were indicated to be recurrent. Another survey (Martin *et al.,* 1988) conducted in mid-1980 found that 1% of complaints causing disability in private household and 2% in communal establishment were due to skin disease. In addition to handicaps a considerable additional direct cost to families were needed as purchasing moisturizers, special soaps, and extralaundry expenses. It was estimated that lothian atopic dermatitis mean cost to the patient was £25.90 per 2 months, while the mean cost to the health service was £16.20 in 1994 (Herd, 1996). The routine data which describe the burden of dermatological disease as medical statistic on skin disorders are scanty. The distinction between any form of skin disease and that, which would benefit from medical care, is particularly prone to vary according to the views of the dermatologists examiner and availability of local services. Even so, some general points can be made regarding the prevalence surveys in developing countries:

i. Skin diseases are very common.
ii. Infections and infestation of the skin predominate.
iii. Skin diseases are most common among the younger age groups.
iv. Most of the dermatoses are easily treated. Making such generalization is always hazardous as even within "developing countries" urban pockets may occur with a disease spectrum very similar to developed countries (Williams, 1998).

1.3. Risk factors: What determines the frequency of skin disease in a population?

1.3.1. Risk factor association and causation: In the first instance, epidemiological studies seek to establish risk factors for disease, i.e. factors, which are associated with an increased frequency of disease. When associations between skin diseases and risk factors are discovered, it should be understood that such associations do not necessarily imply causation (O'Doherty, 1985). The causes of some skin diseases are already established, for example the herpes simplex virus causes cold sore, but for most dermatological conditions, the causes are unknown. Nevertheless, epidermological research has already established many risk factors for skin diseases, which may, help to serve as pointers to specific causes. Direct manipulation of these risk factors may help in preventing or reducing disease even before the specific cause is found. Risk factors for skin disease may operate at many different levels. Some may predispose to disease e.g. a mother with atopic eczema predisposes her child to atopic eczema (Sampson, 1992) some may precipitate disease e.g. exposure to high levels of house-dust mite may precipitate atopic eczema for the first time, and some may be important in perpetuating that disease (e.g. failure to use prescribed treatment may worsen the course of atopic eczema). Some of commonest risk factors for skin disease are:-

1.3.2. Genetics: In addition to a few rare disease such as epidermolysis bullosa, where specific chromosomal mutation have been closely correlated with different diseases phenotypes, several genes may be important in many of the major inflammatory skin diseases. Some genes may be responsible for disease predisposition while others may be responsible for disease severity (Bowker, 1992). Ethnic group may account for some variations in disease rates. Thus, it has been shown that atopic eczema is twice as common in black Caribbean children when compared with similar white children (Williams, 1995) and conversely, mortality from most cancer is less common in black ethnic groups in the UK (Marmot, 1978).

1.3.3. Environment: In the early environments there is evidence to suggest that the experience of the fetus in utero (in terms of nutrition) is critical in programming adult diseases such as hypertension and diabetes (Bowker, 1992) and in utero programming may well operate for many skin diseases such as atopic eczema (Godfrey *et al.,* 1994). The age and sex are

often included in the descriptive epidemiology of many skin diseases and may point to further risk factors. The marked preponderance of female in lichen scleroses, for example, suggests that hormonal factors may be important in this disease. The prevalence of skin disease increases consistently throughout a lifetime. Most people past age 70 have at least one skin problem and many develop three or four skin diseases the common identified signs of aging skin include mottled hyperpigmentation laxity lentigines telangiectasia and tumours. Migration itself may be an important factor in determining skin disease, for example individuals who migrated from China (where atopic eczema is not very common) developed much higher rates of this diseases (similar to the rates in the local population) after migration to Hawaii. Secular factors may reflect changes in the natural history of skin disease or transient environmental exposures. Thus the epidemic of melanoma skin cancer has been attributed by some to the increased exposure to sunlight over the last 40 years (Polednak, 1994). There is reasonable evidence to suggest that the prevalence of atopic eczema has increased two-to three fold over the last 30 years, but the reasons for this change are not clear (Williams, 1992). Geography and climate are important considerations in describing the frequency of skin diseases. Thus, consideration of the marked latitude gradient of melanoma skin cancer in white-skinned peoples has supported the concept, that exposure to sunlight is an important risk factor for this disease (Weinstock, 1997). Paul has drawn attention to the concepts of macroclimate (temperature, rainfall and humidity) and microclimate (domestic and occupational environment). The macroclimate may be crucial to sustain certain infectious disease vectors such as the simulian fly in onchocerciasis or they may account for seasonal fluctuations in pyoderma secondary to scabies during the wet season in Lilougwe in Malawi (Kristensen, 1991)

1.3.4. Socioeconomic factors: Socioeconomic factors may also be crucial in accounting for the distribution of skin diseases. In many poor countries where overcrowding and bad sanitation present, infections or ectoparastic skin diseases such as secondarily infected scabies or pediculosis are more common (Gbakima and Lebbie, 1992) and (Harris *et al.,* 1992). In wealthier countries where such infectious dermatoses are less common, new diseases that affect the cosmetic appearance of sun-damaged skin or thread veins may preoccupy the population in their quest for a perfect skin. Some skin diseases, such as atopic eczema, also demonstrate a genuine positive social class trend, i.e. higher prevalence in more wealthy groups (Williams, 1994). Some of the increase in reported eczema may have been due to differences in reporting between socioeconomic groups, but other genuine environmental factors such as hygiene, carpets, central heating, family size or differences in treatment also probably play part.

1.3.5. Occupational factors: Occupational factors are occasionally a very important factor for skin diseases. Thus exposure to irritant and contact sensitizes in light and heavy industry accounts for a very large burden of hand dermatitis and lost revenue for both individuals and the state. Certain occupations for example mining, where workers are constantly exposed to damp conditions, may predispose to fungal infections. Some diseases may occasionally occur in outbreaks from work-related substances, for example chlorance and dioxins, vinyl chloride disease and hydroquinone-induced leucomelanoma. Infective agents may directly cause or be suspected to cause many skin diseases. Thus, for a long time, it was suspected that fifth disease was caused by an infectious agent, but it was not until 1983 that human parvovirus B19 was identified as the causative organism (Anderson, 1990). Similarly, there is reasonable circumstantial evidence to suggest that diseases like pityriasis rosea are caused by infectious agents even though no specific agent have yet been consistently isolated (Chuang *et al.,* 1983).

1.3.6- Dietary factors: Dietary factors may be crucial in some skin diseases. Some skin diseases such as atopic eczema and acute urticaria may be notified by avoidance of dietary allergens in a proportion of cases. Smoking cigarettes and drinking alcohol may be important risk factors for many skin diseases such as contact dermatitis and psoriasis (Naldi, 1999). Medicines, although intended to alleviate human disease, are very common cause of cutaneous eruption, some of which (e.g. toxic epidermal necrolysis) can be fatal (Williams, 1998).

1.4. Review of literatures: The first Health and Nutrition Examination Survey (HANES-1), conducted from 1971 to 1974 in the USA suggested that 312.4 per 1000 persons in the population had at least one or more significant skin conditions which should be reviewed at least once by physician (Ryan, 1994). Other study in Lambeth, UK, suggested from self report a frequency of 554.7 per 1000 people suffering from some type of skin condition, although the overall prevalence of skin disease believed to justify medical care was calculated to be 225 per 1000 people. A cross sectional study of 1037 persons in Australian (Plunkett *et al.,* 1999) reported that 4.2% had some type of dermatitis and 2.3% had psoriasis. Another Australian survey conducted in 1999 recorded that 9.87% of people said that they had a recent and or long-term disease of the skin at the time of interview (Gill *et al.,* 2000). The latter study revealed that only 49% of people had sought advice from a medical practitioner for their skin condition, with the remainder seeking advice from family, friends. Pharmacist, or self-prescription.

1.4.1. Studies conducted in Middle East: A study was carried out in 1995 to 1997 in dermatological unit in King Khalid Hospital, Hail (Parthasaradhi, Al-Gufai, 1998). (Pramod and Agarwal, 1997) showed that a low prevalence of atopic eczema (8.25%) compared to a high of 14.29% in AL-Jouf and 13.77% in Asir region, while contact dermatitis was 5.99%, viral infections 10.12%, superficial mycosis 6.15%, primary pyodermas 3.19% papulosquamous disorders 4.82%, alopecia 6%, acne 5.45%, cutaneous leishmaniasis 1.87% and urticaria 5.91%. A survey of childhood psoriasis in Kuwait (Al-Fouzan, 1993) showed that the age of onset of psoriasis for children of both sexes ranged from birth to 12 years. Peak onset was between 2 and 4 years of age. The prevalence of skin disorders in 2788 male school children in Jordan (Shakkoury, 1999) showed that the overall prevalence of skin disorders was (19.23%) with leukonychia (36.66%), naevi (12.88%) and headlice (11.01%), alopecia (6.1%), pityriasis alba (8%), acne vulgaris (2.94%), tinea versicolor (0.82%) and atopic eczema (2.12%).

1.4.2. Studies conducted in Iraq: Many researches done in Iraq about the clinical features of skin diseases Al-Waiz, (1995) reported that lichen planus was more prevalent during spring and low in winter, the recorded incidence of lichen planus among out-patient clinic attendance was 1.4% and the age ranged between 5-90 years with the mean age 35 years.

Table 1.1. Overall prevalence rates of skin diseases in population based studies conducted throughout the world

Country	Author and date of survey	Sample size	Study population	Definition	Overall prevalence of skin diseases	Five commonest diagnosis
UK	Rea 1975	2180	Stratified sample of adult	Examination by team of 7 dermatologists and 11nurses	23 %	Eczema Acne Scaly dermatoses Prurigo Erythematous and other disorders
Pakistan	Porter 1980	444	All children aged less than 5 years in three villages in Panjab	Examination by research assistants trained by a dermatologist	36 %	Pyoderma (54% of skin disease) Atopic eczema Scabies Warts Other eczema
Brazil	Bechelli 1981	9995	School children of 6-16 years in 4 urban and 3 rural	Examination by 4 dermatologists	26 %	Pediculosis capitis Pityriasis versicolor Pyoderma Pityriasis alba Dermatophytosis
Faroe Island	Lomhot 1948	10984	Survey of 7 Islands between Norway and Iceland	Examination by Dermatologist	5 %	Eczema Seborrhoeic dermatitis Neurodermatitis Acne Leg ulcer
Mexico	Estrad-Castanon 1990	50000	41 representative communities in Guerrero state (all age)	Examination by team of dermatologists and nurses	50 % of all households included someone with a skin problem	Pityriasis alba Scabies Pyoderma Acne Melasma
Ethiopia	Figueroa 1994	3979	House to house survey in 3 rural communities	Examination by dermatologist	14 %	Ectoparasites Onchodermatitis Dermatophytosis Pyoderma
Tanzania	Gibbs 1994	1114	254 randomly selected households from 2 villages	Examination by dermatologists	27 %	Prurigo Scabies Viral warts Pyoderma Papular urticaria

A cross-sectional study on 3843 school children in Baghdad was done showed that the prevalence of all hypopigmented skin disorders was 44.52% (46.9% in males and 41.6% in females), post inflammatory hypopigmention was found to be the most common hypopigmented disorders (43.3% in males and 38.9% in females) and pityriasis alba was found to be the commonest cause of post inflammatory hypopigmentation (34.4% in males and 30.6% in females), naevus depigmentosus, pityriasis versicolor, vitiligo, and albinism also found to be causes of hypopigmentation (Al-Sudany, 2001). A cross-sectional study in Al-Yarmook Teaching Hospital by Al-Temimi, (2000) showed that the prevalence of infections was (1.3%) which include toe web infection, pseudomonas cellulitis, folliculitis and paronychia (26%, 20.6 %, 17.6% and 12.8 %) respectively.

The study of Ajjam, (2001) found that the mean age of onset of pityriasis rosea was 26.5 years, he also found clear seasonality, where (48.7%) was reported in winter time and 4.9% were seen during summer time. In other study Ajjam found that co-trimoxazol and phenol form the main causative agent of eruption in (42.9%) and (21.4%) respectively, (Ajjam, 2000). A recent skin disease survey carried out in Mosul Mahmoud, (1991) found that 51.7% of positive skin scraping were for scabies. Trichotillomania and primary cutaneous actinomycosis was also reported (Ibrahim, 1999, 2001). Hirsutisim has been also found in (59%) of studied females aged 20-30 years, (Sharquie, 1992). The incidence of contact dermatitis among textile factory makers found to be (10.8%), compared to children Garments factory workers was (4.7%) which may be related to the period of employment (Habash, 1995).

1.5. Sickness behavior in skin diseases: Dermatological health services research is concerned with studying how dermatological health care is delivered with the ultimate aim of benefiting patients. It covers a wide variety of service aspects. People with skin problems obtain help from various sources including self-help, advice from pharmacists, advice and treatment from the primary-care team and specialist services. Little research had been conducted to clarify the relative health gain and appropriateness of various health-care setting for different subgroups of skin disease. Around 30% of those with skin complaint decide to self medicate, and this proportion is similar for trivial and moderate to severe disease. Pharmacist occupy a key role in advising the public on the use of skin treatment products, but whether this advice is beneficial or whether it simply delays appropriate medical consultation has not been studied adequately (Williams, 1996). Self-help groups are often a useful source of advice to those with chronic skin diseases (Funnel, 1995). The majority of those with skin complaint who seek medical help are treated by their general practitioner (GP). In the UK, around 6-8% of all GP diagnosis involve the skin (Steel, 1984) (Horn, 1986). The most recent GP morbidity statistics suggest that (15%) per year consult their GP because of skin condition (Royal College, 1986), as one would anticipate, proportionally more incident disease such as skin infections (e.g. impetigo, herpes simplex and viral exanthems) are seen in general practice than secondary care (Royal College, 1995). Although dermatology covers around 2000-disease reaction pattern over 70% of specialist activity is concerned with less than 10 main disease categories. Age specific attendance rates are more common in female patients and also increase with increasing age and around 12% of referrals were considered inappropriate

dermatologist in one UK study (Stevenson *et al.,* 1991). There is considerable variation in referral rate to specialist care within the UK and there is some evidence to suggest that much of regional variation in referral rate may be governed by established patterns of care and the number of available consultants (Williams, 1997).

1.6- Rationale: There has been no recent survey on the prevalence of skin diseases on a large scale in Ninevah community, apart from studies done on the attendants of the hospitals or primary health care centers, on particular skin diseases like lichen planus (AL-waiz, 1995), fixed drug eruption (Ajjam, 2000), pityriasis rosea (Ajjam, 2001). Few other studies have been done to measure the prevalence of skin diseases in school children like hypopigmented disorders (AL-Sudany, and Gahzi, 2001). These studies give crude figures of skin diseases in community.

1.7. Aim of the Study: The aim of this study is to determine the prevalence of skin conditions among Ninevah governorate population and possible influence of some risk factors.

Specific objectives

1. To assess the prevalence of skin diseases classified according to ICD- 10 classification.
2. To determine the age and sex distribution of skin diseases.
3. To specify urban rural distribution prevalent of skin diseases.
4. To infer the effect of socioeconomic factors on the prevalence of skin diseases (socioeconomic status, education, and occupation).
5. To indicate the effect of housing, animal contact and overcrowding on the prevalence of skin diseases.
6. To compare the official hospital based data with the present survey data.
7. To express the sickness behavior of skin diseased patient in relation to preference types of service providers.

2.1. Study setting: This study was carried out in Mosul city (1311886 million inhabitants) which is the central city of Ninevah governorate (2120923 million inhabitants) situated in the northern region of Iraq and two rural districts; AL-Shamsiat and Tulkeef (809037 inhabitants). The city is divided by Tigris river into left bank that is served by the left health sector (13 Primary health care (PHC) centers), and the right bank which is served by the right health sector (14 PHC centers), while the two rural districts (Al-Shamsiat) which served by Al-Hamdania health sector and Tulkeef which is served by Tulkeef health sector.

2.2. Study design: In this work a cross-sectional study design was adopted. A community household survey was designed to find the prevalence of skin diseases. The information was collected by direct interview, using especially designed questionnaire form that included the following information: Demographic data, socioeconomic status, health services-selection-behavior. The study also included direct observation of houses, including house condition and crowding, house hygiene and dermatological examination of all members of household. The indwellers of Mosul city houses were the urban population, while (Al-Shamsiat and rural part of Tulkeef) constituted the rural population.

2.3. Time of the study: The survey was conducted from June 2001 to May 2002, the tabulation and analysis of the data was done during June and July 2002 and the finalizing of the writing and printing was done during July, August and September 2002 Table (2.1).

2.4. Sample size: The household was used as unit of sampling. Pilot study was conducted in Al-Shamsiat village during the university field practice aiming to assess the applicability of questionnaire used in the survey and to predict the appropriate sample size required for the study. The pilot study includes the household inhabitants of Al-Shamsiat village. The feedback of the pilot study shows that at least 22% of allocated households have one member suffer from skin diseases worth enough for consultation. Based on this result, sample size was estimated by the use of following formula (Hulley,1988):

$= 4\ Z\ \alpha^{2}\ P(1-\ P) \div W^{2}$ (N = Total sample)

$Z\alpha$ = The standard normal deviation for 2 tailed α, where (1-α) is the confidence interval
P = Expected proportion of skin diseases in the pilot study.
W = Total width of the confidence interval.

$$N = \frac{4 \times (1.96)^2 \times 0.22 \times 0.78}{(0.05)^2}$$

Total number of houses = 1054 households needed for the sample. Additional 10% of the estimated sample was added for the risk of non-respondence and the total sample of the houses was rounded to yield 1201 households.

2.5. Sampling design: To draw an inexpensive but representative sample from a large population that is widely spread and difficult to estimate, a cluster random sample technique is adopted (Vaughan, 1989). Cluster sampling: A sampling method in which each unit selected is composed of group of persons rather than individual e.g. villages and households. The total sample estimated for this study has been divided into urban sample and rural sample proportional to the size of each population as follows: Total population of Ninevah governorate (2120923).

Urban rural population = (1311886) (809037) = 2/1 (census 1997).
Urban sample = (6111) population - 851 households
Rural sample = (3342) population - 350 households

The urban sample was taken from Mosul city according to the health centers catchment areas, while the rural sample was taken from villages under the administration of Ninevah governorate, these villages are AL-Shamsiat and rural part of Tulkeef. The design adopted for the sampling of this study was multi- stage cluster sampling with 3 stages. The study population was drawn from the households of the catchment areas related to the selected health centers.

The 3 stages were as follows:-

First stage: Twenty-seven PHC centers distributed into two sectors (right and left) serve Mosul city. The rural sectors (Hamdania and Tulkeef) one center for each. A complete list of all PHC centers was prepared for each of the four sectors. Each center was assigned a number from this list. 6 PHC

centers were randomly assigned by the use of random number table (Fisher, 1962). The 6 PHC centers yield from the list were Karamah, Mansour, Yarmook and Tahreer from Mosul city, Hamdanyah and Tulkeef from rural areas Table (2.2).

Second stage: Catchment area of the 6 PHC centers yield in the first stage were subjected for further sampling as follows: Random selections of the studied areas from the catchment areas were assigned for the study.

Third stage: Systematic random sample of household was done from houses of the selected areas. Nearly (16%) of the houses of the studied area were involved in the survey, except for Al-Shamsiat where 68.9% of the people examined during the field practice of Mosul University 2001.

c. Hygiene: Cleanliness of floor, wall, bed lenin and bathroom were observed and each scored 1 = bad, 2 = good. The house were considered as follow:

   Unclean = total score 4
   Intermediate = total score 5- 6
   Clean = total score 7-8

d. Presence of animals.
e. Contact with animals. Contact with animal was considered absent if the animal cared in a special place that has no access to other members of the family, otherwise it was considered present.
f. Crowding index at bed rooms: By dividing the number of the family member by the number of bedroom and it was scored as follow:

Table 2.2. Stages and distribution of the sample according to health center catchment areas

Health centers	Total population of catchment areas	Total households	Population of studied areas	Number of studied households	Population ought to be studied	
					No.	%
Mansour	63250	1320	8500	198	1554	18.3
Karamah	107365	1438	8400	215	1445	17.2
Yarmook	60282	1429	7368	213	1331	18.1
Tahreer	45640	1500	9400	225	1856	19.7
Tulkeef	25000	1200	10000	180	1467	14.7
Shamsiat	23000	280	2900	170	1998	68.9
Grand total	324.537	7167	46.568	1201	9651	20.7

2.6. Sample coverage: Total number of household samples for this survey was 1201. All the members of the included households were involved in the interview and clinical examination of the study. Repeated visits were done to assure complete coverage.

2.7. Case definition

Skin disease case: A person who identified to have a particular skin condition at the time of the survey.

2.8- The questionnaire form:

Questionnaire design: Because questionnaire was the only instrument used in this study, one month was spent in preparing, revising and re-writing the final form. The question naire (see Appendix) consist of 4 section which were as follows:

1. Identification: serial number, date, name of head family and address.
2. Interview with adults member: education level, job, income, marital status, health services seeking behavior.
3. Observational notes: house building style, number of bed room, cleanliness of floor, wall, beds and lavatories, presence of animal and degree of contact to the family members, personal hygiene.
4. Dermatological examination of all members of household.

2.9. Variables:

1. Housing condition
a. Building style :- Modern = concrete and closed
   Traditional = mud, rocks and opened
b. Ownership (owned or rented)

   Low = 1-2 members / room
   Intermediate = 3-4 members / room
   High over crowded = > 4 members / room

2. Education level: It was scored according to the school graduation level as follows:

Illiterate = has no any formal teaching.
Primary school graduate
Secondary school graduate
University graduate

3. Job (occupation) Student, housewife, laborer, employer, military, retired and unemployed.

4. Socioeconomic status: Three parameters of the head of the family were considered (i.e. educational level, job, and ownership of the house).

Each parameter was scored as follows: Educational level (0 = illiterate, 1 = primary and secondary, 2 = graduate). Job (0 = unemployed, 1 = unskilled, 2 = skilled, 3 = professionals). Ownership of the house (0 = rent, 1 = owned). By summating scores of the three parameters, socioeconomic level was stratified into low (0-3), intermediate (4-6), high (> 6).

2.10. Skin examination: The researcher who is medical practitioner practicing in dermatological department of military hospital for 8 years performed dermatological examination. The exposed part of the body (scalp, face and extremities) was observed directly. The covered area were inquired about presence of skin disease and was examined if subject declare presence of skin disease and agree to be examined, the areas under pants and bra were not examined. The difficult cases were referred to hospital for confirmation of diagnosis.

2.11. Statistical analysis and data management: Statistical package for social science version 10 software (SPSS inc, Chicago, Ill) was used for both data entry and analysis. The approach to data were consisting of 2 steps, first, descriptive and then analysis. The descriptive statistic was done by examining the distribution of variables. The prevalence objective of this study was analyzed as proportion of subjects have skin disease from the total surveyed population with (95% confidence interval) in the whole sample, urban and rural areas, age groups, sex, different housing conditions, education levels, jobs, socioeconomic strata. The diseases detected in this study were arranged in descending frequency. The individual disease was then grouped according to ICD-10 and arranged in descending frequency according to each age group and sex. Arranging of the disease in-groups was done for the analytic statistic. Studying the association between different predictor variable (i.e., age group, sex, house hygiene, presence of animals, education level, job, socioeconomic status and crowding index) and the outcome (presence of skin disease) the magnitude and the pattern of relation of each predictor was examined individually by cross tabulation with outcome. The data was examined by Z test and χ^2 test. The P-value of < 0.05 was considered significant. The health services-seeking behavior (sickness behavior) were present as frequency of selection of parents according to different predictors residence, age group, sex, education level and job.

RESULTS

The results of this community based survey showed that 9453 persons were interviewed and examined for skin disease, they were out of 9651 eligible randomized sample with response rate 97.9 %. They live in 1201 households within the catchment areas of the six health centers that involved in the study Table (3.1). Complete interview was done for 1135 households (94.5%). The total population of these areas was 46568, the randomized illegible subjects constitutes (20.7%) of the total population of areas which was distributed equally for each center except Shamsiat center where (68.9%) of their population were involved in the study. Table (3.1). The demographic characteristic of the studied sample as compared to the general population of Iraq was nearly the same as shows in the figure (3.1) where both pyramids are equally distributed in age and sex.

3.1. Age and Gender: Table (3.2) shows demographic characteristics of study population. Almost 40% were children <15 years of age and 48.9% were among the age group 15-44. A minority (1.9%) were elderly (i.e. +65).Regarding sex distribution the same table depicts that for each 104 males there is 100 females (M: F ratio = 1.04:1). The table also indicates that urban population formed two thirds of the survey sample (64.6%).

3.2. Educational level: The general educational levels for both sexes showed that most of our sample fall in the primary level (64.6% males and 77.9% females). The secondary and graduate level was higher in males (26.0%, 5.2%) than that in females (9.8%, 1.4%) Table (3.3). The illiteracy level was higher in females (10.9%) than that of males (4.2%).

3.3. Socioeconomic variables: Socioeconomic variables according to rural urban distribution of the studied sample showed that (35.4%) were live in rural area (Shamsiat and Tulkeef), while (64.6%) of the sample live in urban.

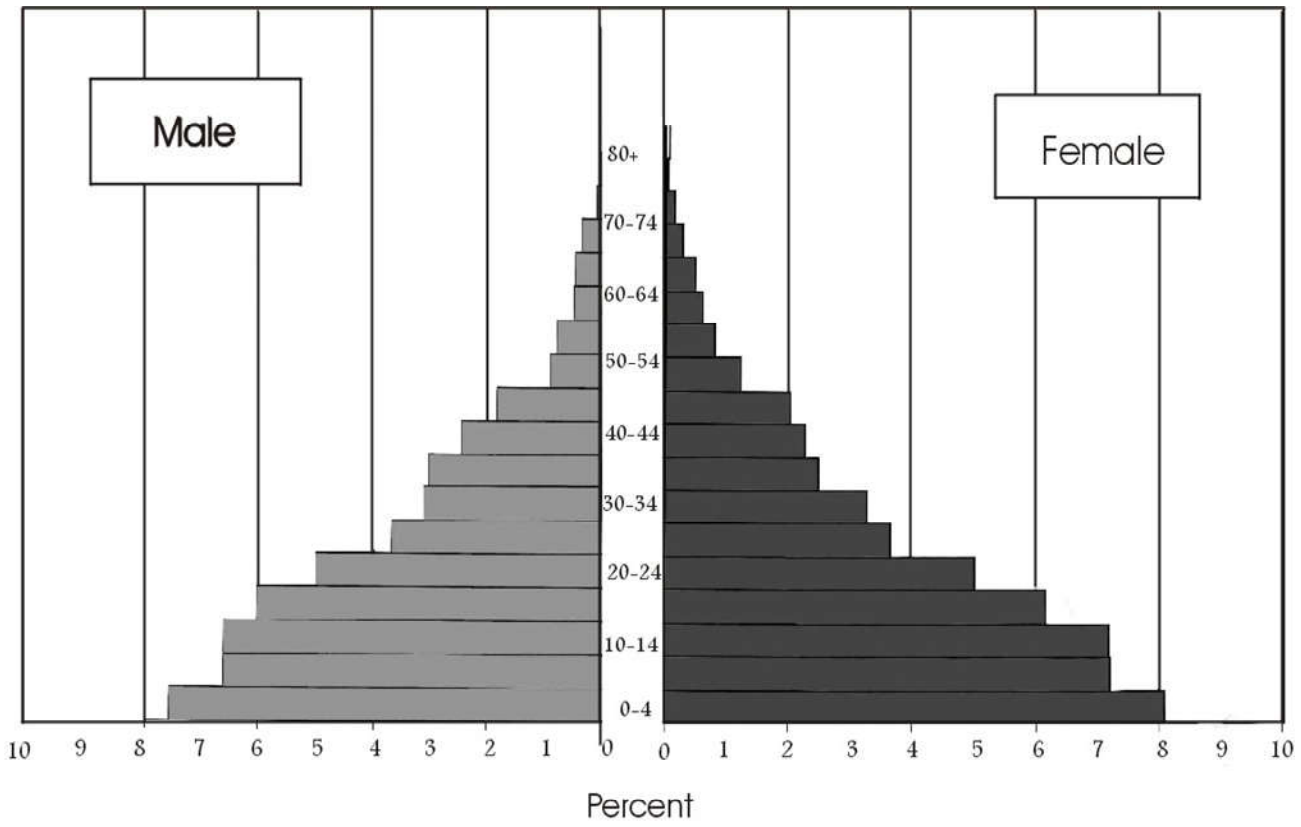
The distribution of the sample for each age group was nearly equal for urban rural except the +65 group which constitute (1.3%) of the urban while in the rural it is significantly higher 3.1%. There is no difference in the sex distribution for both rural and urban population of the sample Table (3.4-A). The result of the educational level for the rural and urban distribution of the sample showed that the illiterate groups was significantly higher in rural area (14.5%) than that of the urban area (3.6%). The distribution of the studied sample according to the job showed that housewife and unemployed groups significantly higher in rural (31.0%-17.0%) than that in urban population (26.7%-13.0%), respectively.

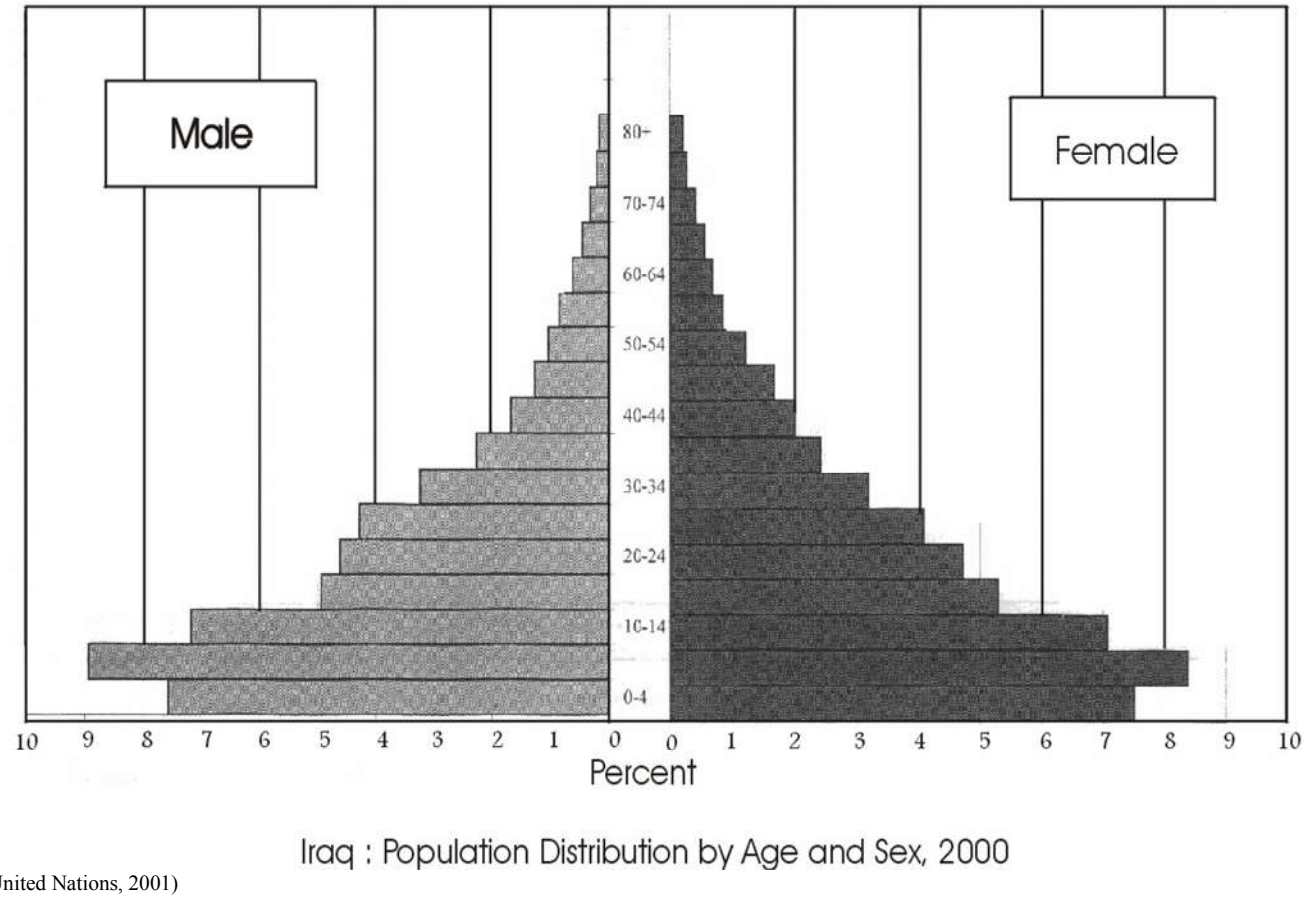
Housing condition: Traditional style houses were significantly higher in rural than that in urban areas. The rent house of our sample was significantly higher in urban (93.1%) than that of rural area (38.3 %) while owned houses were higher in rural areas. The hygienic condition of the houses showed that the clean and intermediate house group was significantly higher in urban (26.1%, 60.4%), respectively. The unclean houses group was significantly higher in rural (31.9%) than that of urban (13.5 %).The animal contact at houses was present in 48.4 % of rural houses and 3.1% of urban houses, while the houses with absent animal contact constitute 96.9 % of the urban and 51.6% of rural houses, with very high significant differences. The socioeconomic status shows that there is no significant difference in urban rural population within the higher-level group. Table (3.4-B). The intermediate and low level show highly significant difference between urban (74.1%, 19.0%), rural (58.2%, 39.9%) population.

3.4. Prevalence of skin disease: Table (3.5) shows the prevalence of skin disease in descending frequency order and classified according 1CD-10 classification. 2779 cases were found at the time of survey out of 9453 persons which constitute the total population sample. The overall prevalence of skin diseases was (293.9‰).The prevalence break down according to specific skin conditions is shown in Table (3.5). The top 10 encountered skin disorders and their point prevalence are: Acne vulgaris, which has got the highest prevalence rate (53.8‰); contact dermatitis (14.9‰); fissure

Table (3.1): response rate of the illegible population according to health center catchment area

Health enter	Total population of the studied area	Population ought to be studied No.	%	Interviewed subject	Respondent rate %
Mansour	8500	1554	18.3	1534	98.7
Karamah	8400	1445	17.2	1435	99.3
Yarmook	7368	1331	18.1	1310	98.4
Tahreer	9400	1856	19.7	1832	98.7
Tulkeef	10000	1447	14.5	1431	98.9
Shamsiat	2900	1998	68.9	1911	95.6
Grand total	46568	9651	20.7	9453	97.9





(United Nations, 2001)

Figure 3.1. Studied population distributed by age and sex compared to Iraqi population

Table 3.2. Demographic characteristics of study population

Demographic criteria		Number of individuals	Percent %
Age (years)	<1	421	4.5
	1-4	782	8.3
	5-14	2628	27.8
	15-44	4627	48.9
	45-64	812	8.6
	+65	183	1.9
Gender	Male	4825	51.1
	Female	4628	48.9
Residence	Urban	6111	64.6
	Rural	3342	35.4
			(n = 9453)

Table 3.3. Distribution of the sample according to educational level

Education level	Male		Female		Total	
	No.	%	No.	%	No.	%
Illiterate	171	4.2	428	10.9	599	7.5
Primary	2638	64.6	3049	77.9	5687	71.1
Secondary	1059	26.0	385	9.8	1444	18.1
Graduate	211	5.2	53	1.4	264	3.3
Grand total	4079	100.0	3915	100.0	7994	100.0

* Children were excluded.

Table 3.4-A. Rural Urban distribution of the studied sample according to socioeconomic variables (age group-sex-education level-job).

Socioeconomic level variables		Rural %	Urban %	Total	
				No.	%
Age group in years	Infant	4.1	4.6	421	4.3
	1 - 4	8.5	8.2	782	8.3
	5 - 14	28.2	27.5	2628	27.9
	15 - 44	47.6	49.8	4627	49.0
	45 - 64	8.5	8.6	812	8.6
	+ 65	3.1	1.3	183	1.9
	Grand total	35.4	64.6	9453	100.0
Sex	Male	50.1	51.5	4825	51.1
	Female	49.9	48.5	4628	48.9
Education level	Illiterate	14.5	3.6	599	7.5
	Primary	67.0	73.4	5687	71.1
	Secondary	15.5	19.3	1444	18.1
	Graduate	3.0	3.7	264	3.3
	*Grand total	100.0	100.0	7994	100.0
Job	Student	42.3	45.1	4172	44.1
	House wife	31.0	26.7	2666	28.2
	Manual	4.3	6.3	530	5.6
	Official	5.4	8.9	725	7.7
	Unemployed	17.0	13.0	1360	14.4
	Grand total	100.0	100.0	9453	100.0

* 1459 Child were excluded

Table 3.4-B. Rural Urban distribution of the studied sample according to socioeconomic variables (Building style-houses status-house hygiene-animal contact-socioeconomic status)

Socioeconomic level variables		Rural %	Urban %	*Total*	
				No.	%
Building Style	Traditional	82.9	13.8	3613	38.2
	Modern	17.1	86.2	5840	61.0
House status	Owned	61.7	6.9	2484	26.3
	Rent	38.3	93.1	6969	73.7
House hygiene	Clean	20.7	26.1	2285	24.1
	Intermediate	47.4	60.4	5271	55.9
	Dirty	31. 9	13.5	1897	20.1
	Grand total	100.0	100.0	9453	100.0
Animal contact	Present	48.4	3.1	1808	19.1
	Absent	51.6	96.9	7645	80.9
Socioeconomic status	*High*	7.9	6.9	688	7.3
	Intermediate	58.2	74.1	6470	68.4
	Low	33.9	19.0	2295	24.3
	Grand total	100.0	100.0	9453	100.0

of sole (14.5‰), which usually occur as a reaction pattern of a thickened inelastic dry skin in response to frequent movement; urticaria (12.5‰), pityriasis alba (12.3‰), seborrhoeic dermatitis (10.8‰), naevus (9.3‰), impetigo (8.0‰), tinea pedis (7.3‰), and psoriasis (6.8‰). These accounted for more than 50% of the cases.The rate of the disease decreasing in order of frequency, the lowest prevalence rate was cutaneous leishmaniasis (0.1‰).

Gender-specific prevalence rate: Gender-specific prevalence rate is shown in Table (3.6). The overall prevalence rate of skin disease for females was (324.1‰), which was higher than the prevalence rate of males (265.1 ‰). Acne vulgaris have prevalence rate (60.1‰) in females while for males it was (47.9 ‰). Fissuring of sole also higher in females (28.5‰) than that of males (1.0‰), while pityriasis alba prevalent in males more than females (16.0‰ and 8.4‰), respectively. Skin tags, pityriasis versicolor, post-inflammatory hyper pigmentation and pruritus were all found to be higher in males than that of females (6.8‰ / 2.2‰, 6.2‰ / 2.2‰, 2.5‰ / 0.2‰, and 2.1‰ / 0.4‰), respectively. The rest of the diseases listed in details in Table (3.8).

Age-specific prevalence rate: The sample were grouped into five age categories: infant, 1-4, 5-14, 15-44, 45-64, and +65 years. Age specific prevalence of skin disease showed that the highest prevalence rate was in the age group 15-44 (355.7‰) while the lowest prevalence was in the elderly (163.9‰). Acne vulgaris has the highest prevalence (95.3‰) among 15-44 age group followed by urticaria (18.8‰). Pityriasis alba has the highest prevalence (38.8‰) in the age group 5-14 followed by acne vulgaris (25.9‰).The highest prevalence of skin diseases among infants was the napkin rash (28.5‰) followed by seborrhoeic dermatitis (28.5‰).For the age group 1-4, the highest prevalence rate was atopic dermatitis (42.2‰), followed by impetigo (21.7‰). Pityriasis alba was the commonest among age group 5-14 (38.8‰) followed by acne vulgaris (25.9‰). The commonest skin disease among aged people was naevus and fissuring of sole (16.4‰ and 16.4‰), respectively. The rest of the diseases prevalence rates were found in Table (3.8).

3.5 Grouping of skin diseases: Grouping of skin diseases which was done according to Don (1986) classification, these groups were done according to the common frequencies of that diseases. When the prevalence of the disease was done according to sex. The infectious dermatoses group has higher prevalence rate in males than that in females, except for parasitic infestation it was significantly higher in females (17.3‰). Pigmentary and hair disorders were also significantly higher in females (17.9‰, 19.9‰) than that in males (9.5‰, 11.0‰). Prevalence of grouped skin diseases according to study settings: Distribution of the prevalence of skin diseases according to study settings showed that the highest prevalence rate of skin diseases was in Al-Shamsiat (340.1‰). The lowest rates was in Mansour (215.1‰). P-value < 0.001, while there were no significant differences among the rest of the centers Table (3.9). The prevalence rate of bacterial, fungal, and parasitic infestations was higher in Shamsiat center (50.8‰, 35.1‰ and 32.4‰), respectively p-value < 0.000, while viral infection was higher in Tahreer and Karamah centers (22.4‰ and 28.6‰), respectively. Drug eruption found to be the highest in Karamah center (8.4‰) and lowest in Tulkeef (0.6‰) p-value < 0.001. Significantly higher prevalence of eczema were found in Shamsiat (58.1‰) and Tulkeef (64.3‰) p-value < 0.011.

Table 3.8. Prevalence rates % according to Don (1986) classification

Skin Disease	Male		Female		Total		P-value*
	No	%	No	%	No	%	
Infectious dermatoses	404	83.7	371	80.2	775	82.0	N .S
A. Bacterial	145	30.1	106	22.9	251	26.6	< 0.02
B. Viral	98	20.3	81	17.5	179	18.9	N .S
C. Fungal	110	22.8	104	22.5	214	22.6	N .S
D. Parasitic	51	10.6	80	17.3	131	13.9	< 0.02
Eczema	210	43.5	249	53.8	459	48.6	N .S
Papuloscaly disorders	54	11.2	43	9.3	97	10.3	N .S
Acne vulgaris	231	47.9	278	60.1	509	53.8	< 0.05
Urticaria	61	12.6	57	12.3	118	12.5	N .S
Skin tumours	78	16.2	74	16.0	152	16.1	N .S
Pigmentary disorders	46	9.5	83	17.9	129	13.6	< 0.001
Hair disorders	53	11.0	92	19.9	145	15.3	< 0.001
Drug eruptions	18	3.7	25	5.4	43	4.5	N .S
Genodermatoses	8	1.7	5	1.1	13	1.4	N .S
Miscellaneous	116	24.1	223	48.1	339	35.9	< 0.001
Total disease	1279	265.1	1500	324.1	2779	294.0	< 0.001
No skin disease	3546	734.9	3128	675.9	6674	706.0	
Grand total	4825	1000.0	4628	1000.0	9453	1000.0	-

* Z-test of proportion was used.

Table 3.9. Prevalence rate ‰ case of skin diseases according to health center.

Skin Disease	Shamsiat ‰	Tulkeef ‰	Tahreer ‰	Yarmook ‰	Mansour ‰	Karamah ‰	Total No.
Infectious dermatoses	134.5	88.7	68.2	60.3	48.9	78.1	775
A. Bacterial	50.8	30.1	20.2	15.3	19.6	16.7	251
B. Viral	16.2	14.7	22.4	24.4	8.5	28.6	179
C. Fungal	35.1	23.1	18.6	16.8	17.6	21.6	214
D. Parasitic	32.4	20.9	7.1	3.8	3.1	11.1	131
Eczema	58.1	64.3	48.1	32.1	31.2	54.1	459
Papuloscaly disorders	8.9	8.4	12.0	10.7	13.0	8.4	97
Acne vulgaris	25.6	70.6	68.2	67.2	38.5	60.6	509
Urticaria	18.3	12.6	9.3	11.5	9.8	12.5	118
Skin tumours	15.7	18.2	18.6	13.7	16.3	13.2	152
Pigmenary disorders	15.2	9.9	13.6	17.6	13.7	11.8	129
Hair disorders	23.0	16.8	10.9	19.8	10.4	10.6	154
Drug eruptions	1.6	0.6	3.8	7.6	6.5	8.4	43
Genodermatoses	-	2.0	1.1	2.3	2.6	0.8	13
Miscellaneous	39.2	30.0	48.1	36.6	24.2	33.5	339
Total disease	340.1	322.1	301.9	279.4	215.1	291.9	2779
No skin diseases	659.9	677.9	698.1	720.6	784.9	708.0	6647
Grand total	1911	1431	1832	1310	1534	1435	9453
P-value*	0.000	0.011	0.410	0.212	0.000	0.857	0.001

*Using χ^2 test.

Table 3.10. Prevalence rate % rural urban distribution of skin disease

Skin Disease	Rural ‰	Urban ‰	R / U	Total		P-value*
				No.	‰	
Infectious dermatoses	114.4	64.0	1.8: 1	775	82.0	0.001
A. Bacterial	41.9	18.2	2.3: 1	251	26.6	0.016
B. Viral	15.6	20.8	0.8: 1	179	18.9	0.001
C. Fungal	30.0	18.7	1.6: 1	214	13.9	0.332
D. Parasitic	27.5	6.4	4.3: 1	131	22.6	0.001
Eczema	60.7	41.9	1.4: 1	459	48.6	0.001
Papuloscaly disorders	8.7	11.2	0.8: 1	97	10.3	0.258
Acne vulgaris	44.9	58.7	0.8: 1	509	53.8	0.004
Urticaria	15.9	10.6	1.5: 1	118	12.5	0.029
Skin tumours	16.7	15.7	1.1: 1	152	16.1	0.699
Pigmenary disorders	12.9	14.1	0.9: 1	129	13.6	0.629
Hair disorders	20.4	12.6	1.6: 1	145	15.3	0.003
Drug eruptions	1.3	6.4	0.2: 1	43	4.5	0.001
Genodermatoses	1.1	1.6	0.7: 1	13	1.4	0.354
Miscellaneous	35.4	36.2	0.9: 1	339	35.9	0.831
Total diseases	332.4	273.0	1.2: 1	2779	294.0	0.001
No skin diseases	667.6	727.0	0.9: 1	6674	706.0	
Grand total	3342	6111	2: 1	9453	1000.0	

* Z-test of proportion was used.

Acne vulgaris has the highest prevalence rate in Tulkeef (70.6‰) and Tahreer (68.2‰), while the lowest prevalence rate in Shamsiat (25.6‰).

3.6- Risk factors of skin diseases: Rural urban prevalence of grouped skin disease: The prevalence of rural urban distribution of grouped skin disease shows that the total prevalence of skin disease was higher in rural (332.4‰) than in urban (273.0‰) p-value < 0.001. Infectious dermatoses group have significantly higher prevalence rate (114.4‰) in rural areas than that in urban areas (64.0‰). P-value < 0.001. Viral infection found to be higher in urban (20.8‰) than that of rural (15.6‰) p-value < 0.001.Eczema, urticaria and hair disorders have higher prevalence rate in rural areas (60.7‰, 15.9‰ and 20.4‰), respectively than that in urban area p-value < 0.01. Drug eruptions were significantly higher in urban than that in rural (6.4‰ and 1.2 ‰), respectively.

Age prevalence of grouped skin disease:- The total prevalence of skin disease showed higher rates in the age group 15-44 and 45-64 (355.7‰ and 300.5‰), respectively. P-value < 0.001. Infectious dermatoses group have the highest prevalence rate in the age group 1-4 (131.7‰) and gradually decreased with increasing age except, for infants where it was (68.9‰) p-value <0.001.

The rate of fungal infection increases with the age, the highest rate was found in the age group 45-64 (30.8‰), except for infants and +65 groups where the rate was (16.6‰ and 16.4‰), respectively P-value < 0.001. The prevalence rate for eczema decrease with increasing age where the higher rate found in children 1-4 (84.3 ‰) and lower rate in + 65 (11.0 ‰). P-value < 0.001. Acne vulgaris was only found in the age group 5-14and 15-44 (25.9‰ and 95.3‰), respectively.Skin tumours found in older age groups 45-64 and +65 (40.6‰ and 38.3‰), respectively, with low prevalence in lower age group. The higher rate of Genodermatoses was found in infants and children (2.4 ‰ and 1.4‰), respectively then decreasing gradually with age Table (3.11).

Educational level and skin disease: The lowest percentage of the prevalence of total skin diseases was in the pre-school (21.7%) and in graduate level (27.3%). The rate was significantly higher in the illiterate (30.7%), primary level (30.4%), and secondary level (33.0%) P-value <0.001. Table (3.12). Infectious dermatoses was significantly higher in the pre-school (10.7%) and illiterate level of education (9.0%), then the rate was decreasing with the increased level of education to be (5.3%) in the graduate level P-value < 0.001.The same pattern was found in bacterial, fungal, and parasitic dermatoses. Eczema found to be higher in pre-school (7.4%) and graduate level (6.1%) and significantly lower in the illiterate (2.5%) P-value < 0.001. Acne vulgaris rate found to be significantly higher in the secondary level of education (10.0%) P-value < 0.001.

Occupation and skin diseases: After exclusion of infants, preschools, and students, no significant difference was found in most groups of the skin disease with relation to categories of occupation, except eczema, acne vulgaris and pigmentary disorders Table (3.13). For the housewife the rate of fungal infection (2.9%), eczema (4.7%), acne vulgaris (7.8%) and pigmentary disorders (2.4%) found to be higher than that in other occupational categories. P-value < 0.001. Eczema was also found to be significantly higher among laborers (4.7%) and employer (5.9) p-value < 0.001.Infectious dermatoses especially viral (5.9%) and papuloscaly diseases (2.4%) found to be significantly high among military. P-value < 0.001. The retired groups complain mostly from skin tumors (5.0%), hair disorders (2.8%) and infectious dermatoses (6.7%) p-value < 0.001

House hygiene: Those people lived in clean house hygienic condition found to have significantly low prevalence rates in infectious dermatoses (6.4%) P-value < 0.05, while those people lived in unclean houses hygienic condition where mostly affected by infectious dermatoses (10.3%), eczema (6.1%), urticaria (1.8 %) P-value < 0.05, 0.017 and 0.026, respectively. Table (3.14)

Animal Contact: The prevalence rate of grouped skin disease was significantly high in the people who were in contact with animal such as infectious dermatoses (12.9%), urticaria (1.7%), hair disorders (2.1%) P-value < 0.002, 0.047 and 0.029, respectively.

The prevalence rate for other groups of skin diseases as papuloscaly disorders (1.1%), acne (6.0%), pigmentary disorders (1.4 %) found to be higher in people without animal contact Table (3.15). Socioeconomic level: The percentage of skin disease cases for the groups of the diseases had generally higher rates in the low socioeconomic level (33.2%) P-value <0.001.The prevalence of infectious dermatoses of the total disease groups (10.7%) was significantly higher than that of high and intermediate socioeconomic level (9.0% and 7.2%) respectively P-value <0.001. Eczema also significantly higher in low level (6.1%), while that for intermediate and high socioeconomic status was (4.4%) and (4.7%), respectively. No significant differences had been found in the rest of the groups of skin diseases. Table (3.16)

Crowding index: Significant difference was found in infection dermatoses group between people lived in houses with crowding index 1-2 persons/room (7.3%), 3-4 persons/room (7.9%), >4 persons/room (10.5%) p-value <0.001. Significant differences was found in eczema (6.2%) in > 4 person/room p-value < 0.001. Table (3.17)

Smoking and skin diseases: No significant difference has been found in infectious dermatoses group between smokers, non-smokers and ex-smokers. For eczema significant differences have been found between the smokers (2.6%) and the non-smokers (5.2%) P-value < 0.048. The rate of papuloscaly was high in smokers (1.4%) than that in non-smokers (1%). Ex-smokers have the highest prevalence rate of papuloscaly (4.2%). Urticaria also with higher percentage (2.2 %) among smokers than non-smokers (1.1%) P-value 0.003. Hair disorders also found to be significantly higher in smokers (2.5%) than non-smokers (1.4 %) P-value 0.007. Table (3.18)

Skin diseases and stress: The percentage of the groups of skin disease found to be significantly higher in people with stress than that in people without stress, except for the infectious dermatoses and genodermatosis, pigmentary disorders and drug eruption groups where no significant differences have been found. Table (3.19) Papuloscaly diseases (2.0%), urticaria (2.3%), tumour (4.1%) and hair-disorders (2.7%) were all found to be significantly higher in people who have stress than that in people with no stress. P-value < 0.001. Table (3.19)

Table 3.11. Prevalence rate ‰ of skin disease according to age group

Skin Disease	Infant %	1 – 4 %	5 – 14 %	15 – 44 %	45 – 64 %	+ 65 %	Total %	P-value*
Infectious dermatoses	68.9	131.7	91.7	72.6	70.2	49.2	82.0	0.001
A. Bacterial	35.6	60.1	12.7	24.0	18.5	21.9	26.6	0.001
B. Viral	7.1	30.7	19.8	17.5	20.9	11.0	18.9	0.464
C. Fungal	16.6	11.5	17.1	27.0	30.8	16.4	22.6	0.001
D. Parasitic	9.5	29.4	32.3	4.1	-	-	13.9	0.001
Eczema	73.6	84.3	62.8	38.2	22.2	11.0	48.6	0.001
Papuloscaly disorders	-	1.3	6.1	14.9	12.3	5.0	10.3	0.001
Acne vulgaris	-	-	25.9	95.3	-	-	53.8	0.001
Urticaria	4.8	3.8	3.8	18.8	19.7	-	12.5	0.001
Skin tumours	-	-	4.6	21.6	40.6	38.3	16.0	0.001
Pigmentary disorders	-	1.3	11.8	19.9	6.2	-	13.6	0.001
Hair disorders	-	-	1.5	24.4	30.8	16.4	15.3	0.001
Drug eruptions	-	7.7	1.9	6.3	3.7	-	4.5	0.043
Genodermatoses	2.4	1.4	1.5	1.3	1.2	-	1.4	0.984
Miscellaneous	16.6	23.0	12.9	42.4	93.6	44.0	35.9	0.001
Total disease	166.3	254.5	224.5	355.7	300.5	163.9	294.0	0.001
No skin diseases	833.7	745.5	775.5	644.3	699.5	836.1	706.0	
Grand total	421	728	2628	4627	812	183	9453	-

*Using χ^2 test.

Table 3.12. Prevalence rate % of skin diseases according to the educational level

Skin Disease	educational level					Total	P-value*
	Pre-school %	Illiterate %	Primary %	Secondary %	Graduate %		
Infectious dermatoses	10.7	9.0	7.8	7.4	5.3	775	0.001
A. Bacterial	4.7	2.0	2.2	2.6	3.0	251	0.001
B. Viral	2.1	2.0	1.9	1.9	0.8	179	0.638
C. Fungal	1.2	5.0	2.2	2.6	1.1	214	0.001
D. Parasitic	2.7	-	1.5	0.3	0.4	131	0.001
Eczema	7.4	2.5	4.7	3.8	6.1	459	0.001
Papuloscaly disorders	0.2	0.5	1.2	1.4	1.9	97	0.001
Acne vulgaris	-	0.8	6.1	10.0	4.5	509	0.001
Urticaria	0.3	1.7	1.3	1.9	1.1	118	0.004
Skin tumours	0.2	3.3	1.7	1.9	2.7	152	0.001
Pigmentary disorders	0.2	0.8	1.6	1.5	0.8	129	0.001
Hair disorders	-	3.0	1.7	1.8	2.7	145	0.001
drug eruptions	0.4	0.3	0.4	0.8	0.4	43	0.250
Genodermatoses	0.2	-	0.2	-	-	13	0.310
Miscellaneous	2.1	8.8	3.7	2.5	1.8	339	0.001
Total disease	21.7	30.7	30.4	33.0	27.3	2779	0.001
No skin disease	78.3	69.3	69.6	67.0	72.7	6674	
Grand total	1459	599	5687	1444	264	9453	-

*Using χ^2 test.

Table 3.13. Prevalence rate % of the skin disease according to occupation

Skin disease	house wife %	Laborer %	Employer %	Military %	Retired %	Un-employed %	Total	P-value*
Infectious dermatoses	7.1	4.8	5.2	11.1	6.7	8.3	385	0.002
A. Bacterial	2.0	2.5	1.3	2.1	2.8	2.9	119	0.055
B. Viral	1.7	0.4	2.6	5.9	2.8	0.9	96	0.001
C. Fungal	2.9	1.5	1.3	2.6	1.1	3.9	148	0.033
D. Parasitic	0.5	0.4	-	0.5	-	0.5	22	0.760
Eczema	4.7	4.5	5.9	0.9	0.6	2.3	198	0.001
Papuloscaly disorders	1.2	1.3	1.0	2.4	1.7	1.5	74	0.549
Acne vulgaris	7.8	7.2	1.3	5.9	-	5.3	336	0.001
Urticaria	1.8	1.1	2.6	2.1	-	2.3	97	0.184
Skin tumours	2.5	1.3	3.7	2.1	5.0	3.1	140	0.067
Pigmentary disorders	2.4	1.3	1.0	1.2	1.7	0.6	91	0.001
Hair disorders	3.0	1.7	2.7	0.9	2.8	2.6	138	0.142
Drug eruptions	0.5	0.2	0.4	0.8	0.5	0.4	27	0.793
Genodermatoses	0.1	0.2	-	0.3	-	0.2	7	0.932
Miscellaneous	7.2	2.8	2.3	3.3	3.8	3.1	270	0.001
Total disease	38.3	26.4	26.1	31.0	22.8	29.7	1763	0.001
No skin disease	61.7	73.6	73.9	69.0	77.2	70.3	3518	
Grand total	*2666*	*530*	*303*	*422*	*180*	*1180*	*5281*	-

Infants, preschools and students (4172) excluded. * Using χ^2 test.

Table 3.12. prevalence rate % of skin diseases according to the educational level

Skin Disease	Educational level					Total	P-value*
	Pre-school %	Illiterate %	Primary %	Secondary %	Graduate %		
Infectious dermatoses	10.7	9.0	7.8	7.4	5.3	775	0.001
A. Bacterial	4.7	2.0	2.2	2.6	3.0	251	0.001
B. Viral	2.1	2.0	1.9	1.9	0.8	179	0.638
C. Fungal	1.2	5.0	2.2	2.6	1.1	214	0.001
D. Parasitic	2.7	-	1.5	0.3	0.4	131	0.001
Eczema	7.4	2.5	4.7	3.8	6.1	459	0.001
Papuloscaly disorders	0.2	0.5	1.2	1.4	1.9	97	0.001
Acne vulgaris	-	0.8	6.1	10.0	4.5	509	0.001
Urticaria	0.3	1.7	1.3	1.9	1.1	118	0.004
Skin tumours	0.2	3.3	1.7	1.9	2.7	152	0.001
Pigmentary disorders	0.2	0.8	1.6	1.5	0.8	129	0.001
Hair disorders	-	3.0	1.7	1.8	2.7	145	0.001
drug eruptions	0.4	0.3	0.4	0.8	0.4	43	0.250
Genodermatoses	0.2	-	0.2	-	-	13	0.310
Miscellaneous	2.1	8.8	3.7	2.5	1.8	339	0.001
Total disease	21.7	30.7	30.4	33.0	27.3	2779	0.001
No skin disease	78.3	69.3	69.6	67.0	72.7	6674	
Grand total	1459	599	5687	1444	264	9453	-

*Using χ^2 test.

Table 3.13. Prevalence rate % of the skin disease according to occupation

Skin disease	house wife %	Laborer %	Employer %	Military %	Retired %	Un-employed %	Total	P-value*
Infectious dermatoses	7.1	4.8	5.2	11.1	6.7	8.3	385	0.002
A. Bacterial	2.0	2.5	1.3	2.1	2.8	2.9	119	0.055
B. Viral	1.7	0.4	2.6	5.9	2.8	0.9	96	0.001
C. Fungal	2.9	1.5	1.3	2.6	1.1	3.9	148	0.033
D. Parasitic	0.5	0.4	-	0.5	-	0.5	22	0.760
Eczema	4.7	4.5	5.9	0.9	0.6	2.3	198	0.001
Papuloscaly disorders	1.2	1.3	1.0	2.4	1.7	1.5	74	0.549
Acne vulgaris	7.8	7.2	1.3	5.9	-	5.3	336	0.001
Urticaria	1.8	1.1	2.6	2.1	-	2.3	97	0.184
Skin tumours	2.5	1.3	3.7	2.1	5.0	3.1	140	0.067
Pigmentary disorders	2.4	1.3	1.0	1.2	1.7	0.6	91	0.001
Hair disorders	3.0	1.7	2.7	0.9	2.8	2.6	138	0.142
Drug eruptions	0.5	0.2	0.4	0.8	0.5	0.4	27	0.793
Genodermatoses	0.1	0.2	-	0.3	-	0.2	7	0.932
Miscellaneous	7.2	2.8	2.3	3.3	3.8	3.1	270	0.001
Total disease	38.3	26.4	26.1	31.0	22.8	29.7	1763	0.001
No skin disease	61.7	73.6	73.9	69.0	77.2	70.3	3518	
Grand total	*2666*	*530*	*303*	*422*	*180*	*1180*	*5281*	-

Infants, preschools and students (4172) excluded. * Using χ^2 test.

Table 3.14. Prevalence rate % of skin diseases according to house hygiene

Skin Disease	House hygiene			Total No.	P-value*
	Clean %	Intermediate %	Unclean %		
Infectious dermatoses	6.4	8.3	10.3	775	0.05
A. Bacterial	2.1	2.7	3.4	251	0.031
B. Viral	1.9	1.8	2.2	179	0.616
C. Fungal	1.6	2.4	2.6	214	0.050
D. Parasitic	0.8	1.4	2.1	131	0.001
Eczema	4.5	4.6	6.1	459	0.017
Papuloscaly disorders	0.7	1.2	0.9	97	0.215
Acne vulgaris	6.0	5.3	4.8	509	0.215
Urticaria	1.2	1.0	1.8	118	0.026
Skin tumours	1.8	1.5	1.7	152	0.638
Pigmentary disorders	1.7	1.4	1.0	129	0.186
Hair disorders	1.6	1.5	1.5	145	0.926
Drug eruptions	0.6	0.5	0.2	43	0.077
Genodermatoses	0.1	0.2	-	13	0.160
Miscellaneous	2.8	3.7	3.9	339	0.089
Total disease	27.4	29.2	32.4	2779	0.002
No skin disease	72.6	70.8	67.6	6674	
Grand total	*2285*	*5271*	*1897*	*9453*	-

*Using χ^2 test.

Table 3.15. Prevalence rate % of the skin diseases according to animal contact.

Skin Disease	Animal Contact		Total No.	P-value*
	Present %	Absent %		
Infectious dermatoses	12.9	7.1	775	0.002
A. Bacterial	4.3	2.3	251	0.003
B. Viral	1.8	1.9	179	0.813
C. Fungal	3.9	1.9	214	0.000
D. Parasitic	2.9	1.0	131	0.000
Eczema	5.6	4.7	459	0.108
Papuloscaly disorders	0.9	1.1	97	0.508
Acne vulgaris	2.6	6.0	509	0.000
Urticaria	1.7	1.1	118	0.047
Skin tumours	1.5	1.6	152	0.667
Pigmentary disorders	1.2	1.4	129	0.547
Hair disorders	2.1	1.4	145	0.029
Drug eruptions	0.1	0.5	43	0.016
Genodermatoses	-	0.2	13	0.079
Miscellaneous	3.7	3.6	339	0.761
Total disease	32.3	28.7	2779	0.003
No skin diseases	67.7	71.3	6674	
Grand total	1808	7645	9453	-

*Using χ^2 test.

Table 3.16. Prevalence rate % of skin diseases according to socioeconomic status

Skin Disease	Socioeconomic status			*Total No.*	*P-Value**
	High %	Intermediate %	Low %		
Infectious dermatoses	9.0	7.2	10.7	775	0.001
A. Bacterial	3.3	2.3	3.4	251	0.007
B. Viral	1.9	1.8	2.2	179	0.406
C. Fungal	2.2	2.0	3.1	214	0.009
D. Parasitic	1.6	1.1	2.0	131	0.005
Eczema	4.7	4.4	6.1	459	0.004
Papuloscaly disorders	0.4	1.1	0.9	97	0.192
Acne vulgaris	5.4	5.5	5.0	509	0.652
Urticaria	0.4	1.4	1.1	118	0.092
Skin tumours	0.7	1.7	1.6	152	0.144
Pigmenary disorders	1.9	1.4	1.1	129	0.248
Hair disorders	1.6	1.4	1.8	145	0.500
Drug eruptions	0.6	0.5	0.3	43	0.448
Genodermatoses	-	0.2	0.1	13	0.397
Miscellaneous	2.9	3.4	4.5	339	0.045
Total disease	27.6	28.2	33.2	2779	0.001
No skin diseases	72.4	71.8	66.8	6674	
Grand total	688	6470	2295	9453	-

*Using χ^2 test.

Table 3.17. Prevalence rate % of skin diseases according to crowding index

Skin disease	Crowds index			Total	P-Value*
	1-2 persons/room %	3 - 4 persons/room %	> 4 persons/room %		
Infectious dermatoses	7.3	7.9	10.5	775	0.001
A. Bacterial	1.7	3.0	3.1	251	0.063
B. Viral	2.4	1.6	1.7	179	0.001
C. Fungal	2.2	2.1	2.7	214	0.055
D. Parasitic	0.9	1.1	3.0	131	0.463
Eczema	4.8	4.4	6.2	459	0.001
Papuloscaly disorders	0.8	1.0	1.4	97	0.008
Acne vulgaris	6.2	5.5	3.6	509	0.161
Urticaria	1.3	1.1	1.4	118	0.001
Skin tumours	1.6	1.7	1.4	152	0.554
Pigmentary disorders	1.7	1.3	0.9	129	0.688
Hair disorders	1.9	1.2	1.7	145	0.043
Drug eruptions	0.6	0.5	0.3	43	0.424
Genodermatoses	0.2	0.2	-	13	0.042
Miscellaneous	3.0	3.8	4.2	339	0.202
Total disease	29.4	28.6	31.6	2779	0.055
No skin diseases	70.6	71.4	68.4	6674	
Grand total	2873	4849	1731	9453	-

*Using χ^2 test.

Table 3.18. Prevalence rate % of skin diseases according to smoking habit

Skin Disease	Smokers %	Non-smokers %	Ex-smokers %	Total No.	P-Value*	P-Value**
Infectious dermatoses	8.3	8.2	2.8	775	0.814	0.093
A. Bacterial	2.3	2.7	-	251	0.327	0.317
B. Viral	2.7	1.8	1.4	179	0.030	0.389
C. Fungal	2.9	2.2	1.4	214	0.111	0.476
D. Parasitic	0.4	1.5	-	131	0.002	0.492
Eczema	2.6	5.2	-	459	0.001	0.048
Papuloscaly disorders	1.4	1.0	4.2	97	0.161	0.005
Acne vulgaris	3.5	5.6	-	509	0.006	0.038
Urticaria	2.2	1.1	1.4	118	0.003	0.981
Skin tumours	3.6	1.4	4.2	152	0.001	0.042
Pigmentary disorders	1.1	1.4	2.8	129	0.498	0.314
Hair disorders	2.5	1.4	1.4	145	0.007	0.984
Drug eruptions	0.2	0.5	1.4	43	0.225	0.307
Genodermatoses	0.2	0.1	-	13	0.564	0.975
Miscellaneous	4.0	3.5	5.6	339	0.483	0.353
Total disease	29.9	29.4	23.6	2779	0.751	0.283
No skin diseases	70.1	70.6	76.4	6674		
Grand total	984	8397	72	9453		

*Using χ^2 test:
*P-value of smokers and non-smokers
** P-value of ex-smokers and non-smokers

Table 3.19. Prevalence rate % of skin diseases according to stress conditions

Skin Disease	Stress %	No stress %	Total	P-Value*
Infectious dermatoses	6.8	8.5	775	0.028
A. Bacterial	1.6	2.9	251	0.002
B. Viral	2.3	1.8	179	0.130
C. Fungal	2.7	2.2	214	0.139
D. Parasitic	0.2	1.6	131	0.001
Eczema	3.4	5.2	459	0.002
Papuloscaly disorders	2.0	0.8	97	0.001
Acne vulgaris	1.9	6.2	509	0.001
Urticaria	2.3	1.0	118	0.001
Skin tumours	4.1	1.0	152	0.001
Pigmentary disorders	1.9	1.3	129	0.065
Hair disorders	2.7	1.3	145	0.001
Drug eruptions	0.5	0.4	43	0.426
Genodermatoses	0.2	0.1	13	0.769
Miscellaneous	7.3	2.8	339	0.001
Total disease	33.1	28.6	2779	0.001
No skin diseases	66.9	71.4	6674	0.001
Grand total	1753	7700	9453	-

*Using χ^2 test

Table 3.20. Community survey prevalence Vs. health services prevalence of skin disease (Ninevah governorate).

Skin Disease	Health services attendance (hospital based) No. = 2120923		Community survey (community based) No. = 9453	
	No.	%	No.	%
Infection	62167	29.3	775	82.0
Non-infection	96118	45.3	2004	212.0
Grand total	158285	74.6	2779	294.0

Table 3.21. Factors influencing the parent's choice of the health care.

Factor	Self remedy %	Traditional medicine %	General practitioner %	Dermatologist %	Total
Age group (years)	1.1	9.1	48.5	41.3	1197
15 – 44					
45 – 64	1.3	9.0	45.0	44.7	455
+ 65	4.2	9.6	47.3	38.9	95
Total	24	158	831	734	1747
P-value*	0.049	0.989	0.448	0.386	0.245
Gender	1.3	8.8	47.1	42.8	809
Male					
Female	1.3	9.3	48.0	41.4	938
Total	24	158	831	734	1747
P-value*	0.963	0.717	0.714	0.553	0.941
Educational level	1.4	8.5	57.6	32.5	304
Illiterate					
Primary	1.4	10.2	49.4	38.9	1005
Secondary	1.3	7.8	38.3	52.6	334
Graduate	1.9	2.9	29.9	65.3	104
Total	24	158	831	734	1747
P-value*	0.957	0.063	0.000	0.000	0.000
Residence	0.9	7.2	59.9	32.0	716
Rural					
Urban	1.8	11.4	41.6	45.2	1031
Total	24	158	831	734	1747
P-value	0.183	0.004	0.000	0.000	0.000

*Using χ^2 test

3.7- Health service attendance Vs community survey: According to the data obtained from the computerized reporting system of the consultation unit of dermatology at Al-Zahrawi Teaching Hospital in Mosul table (3.20) showed that the recorded cases of skin diseases who were attending to the health service institutions during the year 2001(74.6‰) was significantly lower than the prevalence rate found in the current community-base survey (294.0‰). The attendance rate of infectious cases was low (29.3‰), in comparison with that of the community survey's prevalence rate (82.0‰). The attendance rate of the non-infection group recorded by health service was very low (45.3‰) compared with the prevalence rate found in community survey (212.0‰).

3.8 Factors influencing the choice of health care: Four variables (age, sex, educational level and residence) were involved to investigate the health-seeking behavior of the skin disease patients to find the differences in the choice of health care providers. These variables were self-remedy, traditional medicine, general practitioner and dermatologists. Table (3.21). The self-remedy preferred by aged people (4.2%) more than younger age groups 15-44, 45-64 (1.1%, 1.3%), respectively P-value < 0.049. No significant differences have been found in the choice of other categories of health providers. Traditional medicine preferred in all age groups. There is no significant difference in the choice of health care providers for both sexes. The educational level of parents significantly affects the choice of health care provider. We found that illiterate and primary groups mostly chose the available services, that is the GPs of the health centers, while the secondary and graduate levels mostly chose the dermatologists (52.6% and 65.3%), respectively p-value <0.001. Self-remedy and traditional medicine provider were often used by urban (1.8% and 11.4%) more than the rural population (0.9% and 7.2%), respectively. GPs were preferred in rural (59.9%) in the presence of health centers more than other categories of health provider. Dermatologist preferred by urban population (45.2%) more than other categories of health care provider p-value < 0.001.

DISCUSSION

The pitfalls of hospital based studies are: Hospital attendance affected by age-structure of the community, socioeconomic factors and believes. New discoveries and facilities will attract patient to clinic and lead to temporary rise in cases, availability of treatment. Non-reportable diseases are difficult to assess, e.g. sexually transmitted diseases that are considered a stigma in our population. Reported cases are affected by diagnostic competence and interest of practicing doctor. Catchment area of the hospital attendance is usually not clearly defined, undefined denominator, (Al-Khafaji, 1998).

4.1 Study design and sample: The cross sectional study was adopted and designed to give clear overall skin diseases point prevalence in Ninevah governorate. The advantages of the cross-sectional study are:

1. It is a quick, required only one-time examination.
2. Less expensive than other studies.
3. It has well defined population.
4. It is useful in determining association between variables of interest thereby generate hypothesis.
5. Easy to measure fixed characteristics.

The key steps of any survey study are:

1. Clearly defined numerator (case).
2. Clearly defined denominator (population).
3. Good data collection.
4. Good response-rate.

The multi-stage cluster sampling technique was chosen for the study to assure universal representation (Hulley, 1988).

Cluster samples have the several advantages:

- Only a simple sample frame is needed.
- It is easier and faster to do the survey.
- It is often more acceptable to the local community.

Apart from relatively small differences of the extremes of age in this study, the sample seen in general was compatible with the age distribution of the population of Iraq. Hence age-related skin disease was clearly presented in this study. To increase the size of specified subgroup (urban and rural population) the sample was divided proportionally to size of each population. To avoid the effect of small sample the formula mentioned in methodology was used to give the best sample size. The response rate in the survey seems to be very high due to clear appointing of the households, which involved in the study prior to the survey. Also repeated visits of those houses was done for many times to assure coverage of the people ought to be involved in the study. The equity in sex distribution of the sample was achieved by involvement of all the residents of household without exception. This made all the age group presented in the survey same as the universe population. Although the best is tried but still there is error, which is unavoidable in any survey i.e. overestimating chronic disease and underestimating of disease with short duration of illnesses and those that show seasonal fluctuation.

Socioeconomic characteristic:- According to urban rural distribution no significant differences have been found between age groups probably due to compatibility of the surveyed sample. The high percentage of +65 probably due to their presence at home during daytime. The higher percentage of illiterate in the rural areas was probably due to larger number of olds and preschool ages. The higher percentage of unemployed groups in rural area was due to the fact that most of the agricultural workers were private and they declared that they have no work. The percentage of official workers was higher among the urban due to higher number of civil servants. The higher percentage of traditional style house in rural areas was due to customs and to the need of their daily living habits, but still there were many modern style houses. People in rural area owned most of the houses probably because they were not costly. The high percentage of unclean houses in the rural area is due to involvement of the females in the agricultural works or to the difficulty in bringing the water to the houses. Animal contact was more in rural than that in urban community because most of the households were not separated from animal on other hand, harborage of animal is prohibited in urban houses by law.Half of our sample (51.3%) live in overcrowded houses >4 persons/room.The rest of sample live in houses with 1-2 or 3-4 persons/room, this is due to the fact that our sample composed of different economic levels.

4.2. Prevalence of skin diseases: This study has provided data concerning the prevalence of most of skin diseases in Ninevah

community. This data can be depended as a profile of the skin diseases in the region, because it is communities based-study in order to determine prevalence of skin disease in the population with relation to different socioeconomic factors. The study shows high prevalence of skin disease in the study population (293.9‰). In USA Health and National Examination Survey-1 showed that 312.4‰ of the population had at least one or more significant skin condition. A study in lambeth-UK shows that 551.7 ‰ of the sample self report some type of skin condition (Plunkett *et al.,* 1999). Large community studies in Sri Lanka, UK, and in USA have reported that 20% to 47.6% of the population has skin diseases requiring intervention (Edwards, 1995) (Williams, 1998). However, the UK and USA studies recorded only treatable skin diseases or included only certain age groups. In our study most of the people with skin lesions did not think that it was necessary to seek treatment for their problems. Also this study shows that females had skin diseases more than males, a similar finding was seen in study done in England where females more than males consult GPs for skin problems especially those in the age between 15 and 44 years. Comparison of the results of this study with other surveys conducted in developed and developing countries showed that:

- Making comparison between countries is difficult due to the difference in survey methods, sample selection, classification of skin diseases, and times of studies.
- Overall prevalence varies from (5% to 50%). The low prevalence in Faroe Island is due to reporting only those who presented themselves spontaneously with skin disease to the researchers. Again Ethiopian study shows a prevalence of (14%) who considered themselves having skin problem and were examined by researchers. The (50%) prevalence in Mexico (Estrada, 1990) is probably misleading conclusion because households included someone with a skin problem and doesn't give prevalence in the sample. That is why it is importance that investigator should examine all the members of household rather than ask the person whether has or has not skin problem.
- Eczema and acne vulgaris are the main problems in developed countries while infection is main problem in developing countries.
- Although the top 10 diseases in the present study are acne vulgaris contact dermatitis, fissuring of sole, urticaria, pityriasis alba, seborrhoeic dermatitis, naevus, impetigo, tinea pedis, and psoriasis but when grouping of the diseases was done infection, eczema, and acne vulgaris represent around (62%) of all cases.
- *Acne vulgaris topped the list of skin diseases in this study and many other studies conducted in different regions of the world like Sweden (Larsson, 1980). The point prevalence was (53.8‰) which was close to that reported from Sri-Lanka (59‰) (Perera *et al.,* 2000) and it was lower than that reported from Australia (128‰) (Plunkett *et al.,* 1999). This difference was decreased when age-specific prevalence of acne at 14-45 years age group (age of acne) was used and the prevalence was raised to (94‰), which is close to that Australian age adjusted acne figure. Acne was more common in females than males and female: male ratio was 1.2: 1. Similar finding was reported by the Sri-Lanka and Australia surveys. This is probably due to two reasons: first, the earlier onset of acne in females as a consequence of earlier onset of puberty in females; second, acne tends to persist longer in females in comparison to males. These two reasons lead to accumulation of more cases of acne vulgaris among females rather than due to difference in incidence. Although our study showed high prevalence of acne vulgaris (53.8‰), still higher rates (128 ‰, 90.7‰, and 138‰) has been found in Saudi Arabia, Abu Dhabi and Leeds), respectively (Parthasaradhi and Al-Gufai, 1998), (Abu Share'ah and Dayem, 1991). This may be due to an increase health consciousness in these societies, where minor disorders increasingly getting reported.
- *Contact dermatitis occupy the second most common dermatological problem reported in this study, the point prevalence was (14.9‰). This figure is in consistence with the findings of other researchers who estimate the point prevalence of contact dermatitis (20‰). The female to male ratio is 1.8:1. This trend may be constitutional due to the stronger cell mediate immune response among women in comparison to men or excessive exposure to irritants and allergens (Kwangsukitt and Maibach, 1995). The peak age was in 15-44 years age group and may be due to exposure rather than age per se.
- *Fissuring of the sole is a common encountered dermatological problem with a point prevalence rate of (14.5‰). It is mainly a complaint of housewives with a female to male ratio of 28/1. The most common affected age group was 14-45 years. The slippers commonly used by women in this area is usually narrow and ill fitting the sole cause excessive mechanical friction that lead to thickening of the sole. This thick sole is less pliable and in addition to repeated wetting-drying cycle lead to painful fissuring of the sole that cause difficult walking and increase chance of infections.
- *Urticaria occupies the fourth position in this study and the point prevalence (12.5‰). In Romania the estimate point prevalence was (18.8‰) (Popescu *et al.,* 1999) while in Sri-Lanka it was (21.6‰) (Perera *et al.,* 2000). The male to female ratio was equal in our study while in Romania it was 0.6: 1. The most common age group affected was 14-45 years.
- *Pityriasis alba is minor dermatoses but it is a very common problem especially in children. In this study it occupy the fifth common skin disease. A similar position was reported in Jordan (Shakkoury and Abu-Wandy, 1999). From the 3831 children under 15 years participated in this study, 116 child suffered from pityriasis alba (30‰). This figure is higher than reported from Sri-Lanka (15‰) (Perera *et al.,* 2000), but it was lower than reported from Jordan (80‰). The result also shows that male preponderance of pitryiasis alba and it was two time more common in males than females, a similar finding was reported in Romania were male to female ratio 2.5:1 (Popescu *et al.,* 1999). This explain the lower figure of pityriasis alba prevalence in our study in comparison to that from Jordan. While Jordanian study select only males, our study and that from Sri-Lanka involve both sexes that cause dilution of the figure.
- *Seborrhoeic dermatitis occupies the sixth position with point prevalence of (10.8‰). This figure is inconsistence with other study e.g. in USA estimated prevalence range from (10‰-30‰) (Johnson and

Robert, 1978). The disease shows two peaks, one in infant age group and other in the 15-44 years age group. This may be related to sebaceous gland activity which is in infancy it becomes active due to the effect of the maternal hormone then its activity cease till puberty to become active again (Burton and Holden, 1998).

- *Naevi occupy the seventh position in this study with point prevalence of (9.3‰). In Romania survey the prevalence was (10.1‰) while in Sri-Lanka it was (26.6‰). This figure includes melanocytic, vascular and other hamartomas. The female to male ratio was 2:1.
- *Impetigo occupies the eighth position in this study. The point prevalence was (8.0‰). This figure is close to that reported from Sri-Lanka (12.7‰) (Perera *et al.,* 2000) and Taiwan (8.0‰) (Wu *et al.,* 2000) but was higher than that reported from Romania (3.6‰) (Popescu *et al.,* 1999). The male schoolchildren were the most common sufferer. The daily plays that traumatize skin and close contact especially in school make these children susceptible to infection and transmission from one to another (Lewis and Friedman, 2002).
- *Tinea pedis occupy the ninth position in this study. The point prevalence was (7.3‰). This figure was close to that reported from Sri-Lanka (12.0‰) but very low in comparison to Australia (92.0‰). The tradition of wearing slippery during hot days in this area decrease the maceration of toes web space and minimize the chance of colonization by fungi. The female to male ratio was 2:1. This finding was the opposite to that from Australia, this probably due to the wet job of our females cause maceration of their foot and increase the risk of tinea pedis (Rubeiz and Tannous, 2001).
- *Psoriasis occupies the bottom of top 10 diseased list (6.8‰), with male to female ratio 1.2:1. There are wide geographical variations in the prevalence of psoriasis. The figure of psoriasis in Iraq like our geographical location lie midway between the high prevalent areas like Scandinavia and European countries e.g. Denmark (29.0‰) (Brondrup and Green 1981) and the very low prevalent areas like Fareast Asia and Africa e.g. China (3.0‰) (Yui, 1984). In South America studies the researcher failed to detect any case of psoriasis among sample of 25000.

4.2.1. Sex-specific prevalence rate:- The females high prevalence rate that has been found in the current survey compared to males was mainly due to difference in rate of acne vulgaris, fissuring of sole, contact dermatits, naevus, seborrhoeic dermatitis and melasma. Fissure of sole, tinea ungium, and intertrigo that had been complicated by candidiasis is probably due to wet job of the females and the excessive use of the detergents, most of these diseases also found to have predominance in females (Parthasaradhi and Al-Gufai, 1998). Hirsutism has been found in (59%) of the studied females in Baghdad (Sharquie and Al-Khafaji, 1992). The higher prevalence rate of pediculosis capitis which was found in females in our survey, have also been found by other researcher in the republic of Maldives, Mali and Indian (Bhutani, 1987), (Mahe *et al.,* 1995) and (Negi and Parsad, 2001). Infectious dermatoses groups of disease found to have higher rate in males than females which is due to environmental and occupational conditions. Parasitic infestation was higher in females probably due to higher prevalence of pediculosis capitis among girls as a consequence of difficult care of their long hair. Other researchers found the same results, (Vikas, 1997).

Age specific prevalence rate: The highest prevalence rate of the skin disease in infants was seborrhoeic dermatitis and napkin rash (28.5‰). For infants napkin dermatitis (Bowker *et al.,* 1992) has been found in (16%) of them, high prevalence rate of napkin dermatitis among infants was also found by (Patel and Mills, 2000). In (1-4) age group atopic dermatitis (42.2 ‰) found to be the commonest, but decreasing in prevalence after the first 3 years of life (Foley *et al.,* 2001) atopic dermatitis in pre-school age was also found to be the highest rate of skin disease by Perez et al (2001). The high prevalence of bacterial infection among the 1-4 year's group possibly due to repeated trauma, these children prone to infection during playing in addition to not well developed of skin barrier and the tradition of sharing clothes in our societies make this group susceptible for infection (Nobel, 1981). Parasitic infection, which was common in school children, is mainly due to pediculosis capitis. The overcrowding of schools encourage transmission of lice from head to head of student (Shakkoury and Abu-Wandy, 1999). If we relate the grouped skin disease to the age, we find infectious dermatosis has the highest prevalence among preschool, teenagers, and infants. The same finding recorded by many researchers (34%) (Kottenhahn, 1994) and (87%) (Bechelli *et al.,* 1981) Pyodermas constitute (54%) of skin diseases in Pakistan (Haroon, 1985). Acne vulgaris was more prevalent in adolescents and adults (Plunkett *et al.,* 1999) where the age adjusted prevalence (12.8%) and decreasing with increasing age. Papuloscally diseases in 15-44 years age group are mainly due to psoriasis, which has a peak age of onset at 16-22 years. Pigmentary and hair disorders are mainly in 15-44 years because vitiligo, melasma, and diffuse hair loss are mainly diseases of adult.

Rural / Urban prevalence rate: The high rate of infectious dermatoses especially pyogenic in rural (33.2%) as compared to urban area (27.3%) is coincident with the findings of other researchers in Indonesia (Canizares, 1979). The trend was being reversed in urban areas. The high prevalence of infectious dermatoses in rural areas may be attribute to poor socioeconomic level, poor hygiene, and animal contact. Similar trend was observed in poor countries like Pakistan 1980, Brazil 1981, and Tanzania 1994, most probably due to the poor socioeconomic level. Viral infection was common in urban population probably because modernization of the life style can reduce pyogenic, fungal, and parasitic infections but has no role on viral infection (Williams, 1998). In countries with high socioeconomic level like UK, high rate of eczema, scaly dermatoses, acne, and other non-infectious skin conditions were reported.

The educational level: The prevalence rate of infectious dermatoses significantly decreased with the increasing level of education, while the rate of acne vulgaris does not affected by educational level, this is probably explained the reflection of education on the prevention of the infectious dermatosis. The same condition reported in developing countries.

Prevalence rate according to occupation: In housewives the main skin disorder after pyogenic dermatosis was acne vulgaris and eczema probably due to use of detergents. High percentage of skin disease prevalence among housewives was

found in our study (38.3%) the same trend was found by research in Hail region (Parthasaradhi and Al-Gufai, 1998) 6.18%. Occupational factors are occasionally very important for skin diseases, thus exposure to irritants and contact sensitization in houses and industries account for very large burden of hand dermatitis (Williams, 1992). Manual laborers and employers significantly affected by eczema more than other groups this is probably due to contact dermatitis in workers of the factories present in the area.

House hygiene and animal contact:- House hygiene significantly affects the prevalence rate of infectious dermatoses and eczema. For comparison (Perez, 2001) found dermatoses and eczema have higher rate (7.6 %) among people living in houses with low level of hygiene compared with (4.5 %) in rest of his sample. He also found that daily bathing was significantly less frequent among the population with high rate of infectious dermatoses. Poverty and congested housing facilitate dissemination of parasitic infestation among people in Dhaka-Bangladesh (Khan, 1987). As for animal contact, which was mostly found in rural area, high rates of dermatoses were found (12.9 %) if contact with animal present compared to low rates (7.1%) in the absence of contact with animal, other diseases showed no significant variation. This finding was also found in most of the literature of skin diseases in developing countries.

(44%) of patients prior to the initial flare of psoriasis (Seville, 1989), and recurrent flares of psoriasis attributable to stress have been reported in up to (80%) of patients (Polenghi *et al.,* 1994). Urticaria in our study found to be significantly associated with stress, this result coincided with other studies who reported isolated cases of acute urticaria (Longly *et al.,* 1994) and angio-neurotic edema (Haustein, 1990) resulting from stressful situations such as earthquakes and dental procedures.

Comparative frequency of common dermatoses: The study of skin diseases in developing countries seems to repeat a similar pattern. The comparative frequency of common dermatoses in Ninevah (Iraq), Karachi (Pakistan), and Ibadan (Nigeria) seems to have similar pattern for infectious groups, while this pattern was reversed in European countries. In London (England) the frequencies of pigmentary disorders and eczema constitute the main groups while the pyoderma and others found to have lower frequencies.

4.3 Health service attendance Vs community survey:- A comparison between hospital attendance and the community prevalence of skin diseases was presented by this study. The results show that only (25%) of skin diseased patients attend hospitals. The difference was statistically significant. The results also show that (35%) of patients with infectious

Table 4.1. Comparative frequency of common dermatoses in four countries.

Disease order	Ninevah (Iraq)	Karachi (Pakistan)	Ibadan (Nigeria)	London (England)
1	Acne vulgaris	Scabies	Fungal Infection	Viral Infection
2	Eczema	Eczema	Pigmentary disorders	Eczema
3	Pyoderma	Pyoderma	Eczema	Pigmentary disorder
4	Fungal Infection	Fungal Infection	Viral Infection	Pyoderma
5	Viral Infection	Acne vulgaris	Pyoderma	Pruritus
6	Pigmentary disorders	Pruritus	Acne vulgaris	Fungal Infection
7	Urticaria	Viral Infection	Pruritus	Urticaria
8	Miliaria	Urticaria	Urticaria	Acne vulgaris
9	Scabies	Pigmentary disorders	Scabies	Scabies
10	Pruritus	Miliaria	N.M	N.M

Adopted with rearrangement from (Grossman, 1987).

Smoking and skin diseases prevalence:- The risk for papuloscaly diseases that include psoriasis was higher in ex-smokers (4.2%) and current smokers (1.4%) than in people who had never smoked (1.0%) p-value 0.046. Similar to other studies (Naldi *et al.,* 1999) found that the risk for psoriasis was higher in ex-smokers and in current smokers than in patients who had never smoked. Urticaria, tumours and hair disorders were all have higher prevalence rates (2.2%, 3.6% and 2.5%), respectively in smokers and also in ex-smokers (4.2%, 4.2% and 1.4%), respectively than that in non smokers (1.1%, 1.4% and 1.4%), respectively p-value < 0.004, 0.001 and 0.009.Skin tumours were also found to be significantly to have higher rate in smokers than non-smokers.

Stress and skin disease prevalence:- Stress found to be significantly affecting the rate of papulo-scaly diseases, urticaria, skin tumours, and hair disorders. A large number of skin diseases, including atopic dermatitis and psoriasis, appear to be precipitated or exacerbated by psychological stress (Garg *et al.,* 2001). Nevertheless, the specific pathogenic role of psychological stress remains unknown. Recent studies provide the first link between psychological status and cutaneous permeability function in humans and suggest a new pathophysiological paradigm, i.e., stress-induced derangement in epidermal function.Major stress has been noted to occur in

dermatoses attend hospitals while only (20%) of patients with non-infectious dermatoses attend hospitals. This may be due to the acute nature of infection force the patient to seek help in health institutions. The comparison is not very accurate because of the denominator of the hospital attendance was not clearly defined. Some of the patients prefer private services others prefer self-remedy and traditional medicine. Still we can have clear picture about the difference between those who have skin disorders in the community and those who attend the health services centers for medical care.

4.4 Factors influencing the parent's choice of health care:- To investigate the health-seeking behavior of urban and rural communities in Ninevah governorate, the factors of age, sex, educational level and residence of the parents were studies. The children's' choice was not detrimental because it is mainly affected by the parent's choice. A total of 1747 parents were involved in the investigation, and they were asked about the main types of service providers in the community from which people with skin problems obtain help. The various source including self-remedy, traditional therapist, GPs and dermatologist sources (Willams, 1997). The highest percentage of choices was GPs of the PHC centers (47.6%) which is available and near-by the patient house. (Horn, 1986) and (Steele, 1984) and (Julian, 1999) report that 19% of all GP

consultations were skin disease problems that constitute high percentage of attendance this probably due to the system of health care in the U.K. The rate of self-remedy reported to be higher especially in chronic conditions (Funnell, 1995). Dermatologist was preferred by (42.0%) of the parents who go directly without referral, this was probably affected by the economic status of the family. The percentages of traditional and self-remedy were low compared with the choice of modern medical services. No significant difference has been found in the choice of services in relation to age and sex, but the educational levels and rural urban residence have significant difference where graduate level mainly prefer dermatologist and self remedy. Traditional medicine found to be preferred by urban (11.4%) more than rural (7.2%) parents, probably due to availability of the herbalist in urban areas are more than rural areas.

Conclusion

1. The overall prevalence of skin diseases is very high in the community that we have surveyed.
2. Pyogenic dermatoses are more common in rural areas.
3. Atopic dermatitis is common, decreasing in prevalence after the first three years of life.
4. Housewife was mostly affected by common skin diseases compared to other groups of population.
5. Hygienic condition of the houses and crowding affect the prevalence of skin diseases specially infectious dermatoses.
6. Animal contact increases the prevalence of infectious dermatoses and eczema.
7. The prevalence of skin disease increases with the decrease level of socioeconomic status.
8. Papuloscaly disorders, skin tumours and hair disorders were high among smokers and stressed persons.
9. There were clear differences between community prevalence and hospital attendance data for a number of skin diseases.
10. These data give an indication of the magnitude of the frequency of the disease and the potential impact on health services in our community.
11. General practitioners and dermatologists constitute the major choice of health care providers for skin diseased patient, while self-remedies and traditional medicine were the minor one.

Recommendations

1. Educational programs directed toward the public in general at those caring for preschool age and school children that provide information on simple preventive measures, which practical and reduce the morbidity of skin disease in predisposed children.
2. Improve personal hygiene and hygienic condition of the houses will reduce the morbidity of skin disease.
3. Separation of houses from the breading stables of animals may reduce the frequency of some infectious dermatoses acquired from animals.
4. Self-remedy and traditional medicine constitutes important sources of medical care in developing communities, special programs to improve this to lower the burden on the health services.
5. The preset survey record a comprehensive picture regarding prevalence of skin diseases so that our data could be used as bases to plan interventions at community level.

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