An-Najah National University
Faculty of Graduate Studies

Prevalence of Asthma and Allergy and Their Risk Factors Among An–Najah National University Students - Nablus - Palestine

By
Wafa Allam Theeb Minawi

Supervisor
Dr. Mohammad Musmar

Co-supervisor
Dr. Samar Ghazal/ Musmar

Submitted in Partial Fulfillment of the Requirements for the Degree of Master in Public Health, Faculty of Graduate Studies, at An – Najah National University, Nablus, Palestine.

2005

Prevalence of Asthma and Allergy and There Risk Factors Among An–Najah National University Students-Nablus-Palestine

By
Wafa Allam Theeb Minawi

This Thesis was defended successfully on 5/9/ 2005 and approved by:

Committee Members	Signature
1. Dr. Mohammad Musmar (Supervisor)	
2. Dr. Samar Ghazal/ Musmar (Co-supervisor)	
3. Dr. Qasem Al maani (External Examiner)	
4. Dr. Sulaiman khalil (Enternal Examiner)	

TO

MY PARENTS

SISTERS, BROTHERS, AND FRIENDS

WITH LOVE AND RESPECT

Acknowledgment

I would like to express my special, deep thanks to my supervisor Dr. Mohamed Musmar and co-supervisor Dr. Samar Ghazal \ Musmar, for their supervision, guidance, support and help throughout this study.

I am also grateful to An – Najah University staff and students, Arabic computer Technicians, volunteers and managers who continue to make this study possible.

Table of Contents

Lists of Tables

Lists of Figures

Glossary

- Allergen: a foreign substance that triggers an allergic response in a susceptible person.

- Allergies: are hypersensitivity reactions of the immune system to specific substances called allergens.

- Asthma**:** a eversible obstruction of airway due to bronchial hyperactivity, associated with inflammation of the airway.

- Atopy: refers to the inherited predisposition to allergic disease.

- BMI: body mass index.

- Chest tightness: A symptom of asthma caused by over inflation of the lungs due to the difficulty in pushing air out through obstructed air passages.

- ECRHS: The European community respiratory health survey.

- Eczema: is an inherited skin sensitivity that can be easily irritated by many factors.

- IgE: The immune system makes immunoglobulin type E (IgE) antibodies against that specific allergy producing substance, or allergens.

- ISAAC**:** international study of asthma and allergies in childhood.

- NHIS: national health interview survey.

- NSAIDs: non-steroidal anti – inflammatory drug.

- Peak expiratory flow (PEF): is the maximum flow achieved during

Expiration delivered with maximal force starting from the level of maximal lung inflation.

- Peak flow meter: a small, portable monitoring device that measures the amount of effort to force air out of the lungs.

- PFTs: Pulmonary function tests.

- Prevalence: the prevalence of a disease is the number of cases defined population at specified point time (R.Beaglehole, et al).

- Rhinitis: is inflammation of the membrane tissue in the nose , causing sneezing, a runny nose , and a blocked nose**.**

- The Forced Expiratory Volume in 1 second (FEV1) is the volume of air expired in the first second. This is an important predictor of outcomes in patients with COPD.

- Triggers: An Irritating substance or condition to which a person reacts when they are exposed.

- Wheeze: a symptom of asthma caused by the whistling sound made when air is pushed past an obstruction or narrowed area of an airway.

- Persian: study were to derive equations for the prediction of normative spirometry values for a large population of Persians in Isfahan..

Prevalence of Asthma and Allergy and Their Risk Factors Among An–Najah National University Students - Nablus - Palestine

By
Wafa Allam Theeb Minawi
Supervisor
Dr. Mohammad Musmar
Co-supervisor
Dr. Samar Ghazal/ Musmar

Abstract

Asthma and allergic conditions have become more prevalent during the past three decades. Asthma causes significant morbidity and mortality and has resulted in a towering public health burden. Inhalant allergic conditions such as seasonal and perennial allergic rhinitis are also quite common. The effect of asthma and allergy on an individual's quality of life and the extent to which it may restrict daily activities is often overlooked. Controlling allergies can significantly decrease health care cost as the purpose of asthma and allergy treatment is to manage the disease in order to live as normal a life as possible and this also can be done by providing community and professional education.

The purpose of this study, a first of its kind in this age group in Palestine, is to estimate the prevalence of asthma and allergy among young adult population in Palestine represented by An- Najah University students.

The study sample consisted of around 1000 randomly selected students from all colleges of the University**.** The researcher collected the data through student group interview. Self reported questionnaire were filled, then PEF measurement was done based on the expert panel report 2.The results were recorded and the level of error was corrected for by using equation for PEF derived by Millar et al 1992. Predicted values were calculated for each individual with the Persian equations & Nunn and

Gregg equations**.**

All data of the questionnaire and PEF measurement for the study sample were entered into the computer and computed using SPSS program and applying Chi–square test, with 95 % level of significant (P value = 0.05).Although some results were inconsistent with the literature, especially those related to global asthma and allergy risk factors, we had important positive results.

The following points worth reporting:

- Physical diagnosis asthma prevalence was 0.33% and the prevalence of ever wheezing was 0.46%, the prevalence of allergic rhinitis, skin allergy, latex rubber allergy, food allergy, drug allergy and insect sting allergy were 3.1 % 2.5% 0.26% 0.88% 0.67% and 2.5% respectively.

- The prevalence of asthma and allergy in Palestine was markedly lower than that of Israel; however, our results were close to another study carried out in Duzce in Turkey.

- Our results indicate male predominance for those who have asthma & skin allergy.

- Upon the distribution of allergic disease for study samples according to their residence, the results show that the highest percentage of asthmatic subjects were from villages, and the highest percentage for those who have skin allergy were from the camps.

- Prevalence of asthma in our study doesn't appear to be related to the social or environmental factor.

- Neither gender nor residence & environmental factors have statistically

significant relationship with allergic rhinitis.

- Poor housing conditions of refugee camps dampness (which encourages the growth of moulds, dust, mites, ect.) might explain the double percentage of skin allergy in refugee camps than other places.

- Adult Palestinian have minimally lower peak expiratory flow value and prediction equations based on European population may not perform well for them .Adoption of Persian equation for PEF seems to be more accurate for young adult Palestinians.

- Further studies on large scale for asthma and allergy in Palestine, and the proper use & value of PEF for Palestinians are called for.

CHAPTER ONE

LITERATURE REVIEW

AND AIM OF THE STUDY

Literature Review
And Aim of the Study

1.1. Definitions of Asthma and Allergy

Allergies are hypersensitivity reactions of the immune system to specific substances called allergens, the most severe form of allergy is anaphylactic shock, which is a medical emergency, (www.hon.ch\library). Asthma has been defined as reversible obstruction of airway due to bronchial hyperactivity, associated with inflammation of the airway, (Tatter Field et al, 2002). Asthma and allergic conditions have become more prevalent during the past three decades, (Eupton et al, 2000).As one of the United States most common chronic conditions, asthma causes significant morbidity and mortality and has resulted in a towering public health burden. In the United States, asthma was primary reason for 10.4 million office visits and 1.8 million emergency department (ED) visits in year 2000,(CDC 2000-2001). Inhalant allergic conditions such as seasonal and perennial allergic rhinitis are also quite common; they affect as many as 40 to 50 million people in the United States and often accompany asthma,

(Nayak, 2003).

1.2. Pathophysiology of Asthma and Allergy

Although links between allergy and asthma have been known for many years, they were recently reemphasized. In fact, estimates show that 60 to 78 percent of people who have asthma also suffer from allergic rhinitis, which is implicated as a trigger for asthma attacks among adults and children. Controlling allergic rhinitis appears to help control the symptoms of asthma, (Nayak 2003). However, more focused linkage studies have identified some common chromosomal linkage between atopic dermatitis

(AD) and asthma. The AD linkages do correspond with known asthma loci, indicating that AD shares genetic determinants with asthma, (Foister et al 1998,and Beyer et al 2000). Allergy comes about when the immune system, which is there to protect us from harmful invaders like viruses and bacteria, reacts to a normally harmless substance like pollen. The immune system makes immunoglobulin type E (IgE) antibodies against that specific allergy – producing substance, or "allergens", these IgE antibodies attach to the surfaces of two types of immune system cells: mast cells and basophiles. When these IgE antibodies encounter the allergen they were manufactured to recognize–like the pollen grain–they attack it and trigger the cells to release packets of chemicals they contain, those chemicals include histamine and other compounds that cause the symptoms like runny nose itchy eyes and sneezing that you know as an allergy, (MFMER, 2004).

1.3. Common Types of Allergies

The following are different types of allergies described in the medical literature, (cross et al 1998):

- Asthma
- Rhinitis – both seasonal (hay fever) and perennial
- Food allergy
- Stinging insect allergy
- Anaphylaxis
- Eczema
- Allergic Conjunctivitis
- Drug allergy

1.4. Prevalence of asthma and allergy

The European community respiratory health survey (ECRHS) which was the first study to assess the geographical variations in asthma and allergy among adults , has shown that there are large geographical differences in the prevalence of asthma, atopy and bronchial responsiveness, with high prevalence rate in English speaking countries and low prevalence rates in the Mediterranean region and Eastern Europe, **(**Janson et al, 2001**).**

1.4.1. Asthma and allergy prevalence worldwide

- In 1998 international study of asthma and allergies in childhood (ISAAC) steering committee conducted study to investigate worldwide prevalence of asthma, allergicrhino conjunctivitis, and atopic eczema. A total of 463801 children aged 13-14 years in 155 collaborating centers in 56 countries results showed differences of between 20 fold and 60 fold between centers in the prevalence of symptoms of allergy. For asthma symptoms, the highest 12-month prevalence were from centers in the UK, Australia, New Zealand and republic of Ireland, followed by centers in North, central and South America. The lowest prevalence was from centers in several eastern European countries, Indonesia, Greece, China, Taiwan, Uzbekistan, India, and Ethiopia. For allergic rhino conjunctivitis, the centers with the highest prevalence were scattered across the world. The centers with lowest prevalence were similar to those for asthma symptoms. For atopic eczema, the highest prevalence came from scattered centers including some from Scandinavia and Africa that were not among centers with the highest asthma prevalence, the lowest prevalence rates of atopic eczema were similar in centers as for asthma symptoms. (ISAAC, 1998).

1.4.2. Allergy prevalence in the Middle East countries

- According to a study on the prevalence of asthma in children living in villages ,cities and refugee camps in Palestine, in autumn of 2000, the crude prevalence rate for wheezing –ever," wheezing in the previous 12 month, and physician –diagnosed asthma" were 17.1, 8.8, 9.4 % respectively, with urban area having higher prevalence rate than rural areas. Within urban areas, refugee camps had higher prevalence rate than cities, the prevalence of asthma and asthma symptoms in Palestine appears to be close to that of Jordan, but is much lower than Israel, (El–Sharif et al, 2002).

- Another study was carried out on the differences in the prevalence of asthma and current wheeze between Jews and Arabs, showed that the prevalence of asthma and current wheeze was significantly higher in Jewish children compared with Arab children. The asthma prevalence was 7.8% for Jewish children and 4.9% for Arab children, (Shohat et al, 1997).

- A study of prevalence of self – reported allergic conditions in adult population in Israel showed that allergic conditions were higher in the Israeli Arab population and those with low income and low education Level, (Shahar and Lorber, 1999).

- Screening for asthma and associated risk factors among urban schoolchildren in Abha city, Saudi Arabia showed that the prevalence of asthma in schoolchildren in Abha is greater than that reported from most developing countries and closer to the rates reported in developed Countries, (Al Shehri et al, 2000).

- Prevalence of asthma symptoms was surveyed in Omani school children,

the results showed that the estimated mean national 12-month prevalence of any wheeze, night waking with wheeze, speech limiting wheeze and exercise wheeze were respectively 7.8%, 3.5%, 3.2% and 6.4% for the (6 - 7) year age group and 8.9% 2.9%,4% and 19.2% for the 13-14 year age group. Both age groups reported high Prevalence of night cough (19.6 % and 20.9% in the younger and the older children respectively). The prevalence of self – reported asthma diagnosis was higher in the older age (20.7%) vs. (10.5 %), in the younger age group, the diagnosis of asthma was more common in boys, (Riyami et al, 2001).

- A cross –section study on the Frequency of allergic rhinitis in school – age children (7-18) in Tehran showed that 23.5% of screened children had allergic rhinitis (AR).The total prevalence for asthma was 3.5%, and 7.2% in AR subjects, the prevalence 7.2% in the AR subjects. The prevalence of cautanous allergy also was 35.8% in children with AR. The positive history of atopy (AR, asthma or cautanous allergy) in the first-degree relative was detected in 47.9%, of (AR) cases, (Ghazi et al, 2003).

1.4.3. Asthma and allergy prevalence in Western countries

- International study of asthma and allergies among children in 2 Canadian cities. (Hamilton Saskatoon) showed that The prevalence of eczema was slightly higher in Saskatoon in both age groups, 6-7 years old and 13- 14 years old (Habbick et al,1999).

- Results from the national health interview survey (NHIS) in the United States indicate that gender and age affect the prevalence of asthma. This study showed that: In children, the prevalence of asthma is higher in boys than girls. The male – to –female ratio of asthmatic is 3:2 among children

ages 6-11 and increases to an 8:5 ratio among those ages 12-17. In adults, and particularly among those ages 45-74, the gender ratio reverses. In this age –groups, asthma is more prevalent in Women, (Mannino et al, 1998).

- A study on the prevalence of asthma and other atopic diseases in Australian children showed that the prevalence of wheeze was Significantly higher in boys (27.4%) than girls (21.7%). Children born in Australia were more likely to report current wheeze than those born elsewhere, (Robertson et al, 1998).

- A study about prevalence of asthma and allergy (part of ISAAC study) in Scandinavia and eastern Europe showed that the prevalence of wheezing among the 13-14 year old children was high in Finland and Sweden, low in Estonia Latvia and Poland , and very low in Albania, Romania, Russia, Georgia and Uzbekistan (except Samarkand). The prevalence of itching eyes and flexural dermatitis varied in a similar manner between the three regions. The regional differences were less pronounced among the 6-7 year old children in the seven participating centers. The highest prevalence of rhinitis was recorded in April –July in Scandinavia and during the winter months in the other countries. The prevalence of atopy related disorders was higher in Scandinavia than in Estonia, Latvia and Poland, which in turn had a higher prevalence than five other countries of Eastern Europe with a culture less similar to Western Europe, (Jorksten et al, 2004).

1.4.4. Asthma and allergy prevalence in China

- An (ISAAC) study about prevalence of asthma and allergy in Hong Kong school children at age (13-14) year showed that the prevalence rates of asthma ever, wheeze ever, and current wheeze were 11,20 and 12%,

respectively, and were greater in boys. Rhinitis affected slightly over half of the subjects (52%) and eczema was reported by a sixth (15%), while current rhinitis and current eczema were present in 44% and 3.6% of children, respectively. Parental education and passive smoking were not important factors when compared to previous epidemiology data obtained in 1992, the prevalence rates for asthma ever and wheeze ever had increased by 71 and 255%, respectively, in Hong Kong school children. The severity of asthma and respiratory symptoms showed a similar increasing trend, (Leung et al, 2004).

1.4.5. Asthma and allergy prevalence in Africa

International (ISAAC) study of asthma and allergies in 6-7 year old carried out in Nigeria primary school children demonstrated a high prevalence of atopic conditions among children in Ibadan, Nigeria, with more than three fifths of the children who had current wheezing also showing symptoms of other atopic diseases, (Falade et al, 2004). In review all the pervious studies, the prevalence of asthma and allergy are generally lower in Middle East than in more developed countries and there are not enough comprehensive studies about asthma and allergies prevalence in Arab countries, including Palestine.

1.5. Causes and triggers of asthma and allergy

The tendency to have asthma and other atopic disease is inherited, probably on several genes. The increase in prevalence of asthma over the past two to three decades is unlikely to be explained by a change in genetic constitution and more likely reflects environmental changes leading to condition being activated in an increased number of genetically susceptible people. International comparisons of prevalence suggest a correlation with

the process of "westernization" or modernization, (Taylor 1995). Perhaps the rapid increase in vehicular traffic that has occurred in recent years, and its associated emissions, has been one of the major contributory factors to sharp rise in the prevalence of allergic disease. The finding from various experimental and epidemiological studies, (Peterson, Saxon 1996), has supported this prevalence.

1.5.1. Out door allergens (such as tree, grass, weed pollens and mold spores)**.**

A study was carried out in the southern part of Switzerland in 1990 - 1993 to determine the spectrum of cutaneous sensitivity to a large amount of pollens and several perennial allergens. At the top of allergens list were grasses – pollens (72 % of the patient had sensitivity). Of real interest in this study area are, besides the classical allergy – inducing pollens, those of chestnut, parietaria, olive tree, ash tree, and cupressaceous (for example cypress). Chestnut pollens represent about 30% of the airborne pollens in this region, 30% of the patient had sensitivity against dust mites. And 20 % against cats. Sensitivity against mould spores was 2- 9 %, (Gilardiet et al 1994).The exact prevalence of fungal allergy is not known. Studies based on skin tests suggest that at least 3-10 % of adults and children worldwide are affected by fungal allergy, (Bush et al 2001, Kurupet et al 2000).

1.5.2. Indoor allergens

(Such as house dust mites, cockroaches, animal dander, painting, environmental tobacco smoke, volatile organic compound). Home dampness at least maintains currently symptomatic asthma, allergic rhinitis and atopic dermatitis, and increase the susceptibility to common colds and possibly to other respiratory infections, (Kilpelainen et al 2001).

- **Cockroaches**: increasing interest has been developing about the role of cockroach allergens in asthma and allergy. The presences of anti – cockroach IgE has been shown to be a risk factor for acute asthma in a number of recent studies. It tends to be most important in asthmatics living in poor inner city accommodation, (Rosentreich et al 1997).

- **Animal dander**: Hypersensitivity in proximity to animals has also been known for a long time. A variety of animals can lead to sensitization, cats produce three main allergens: FeId 1 is a protease,and is found on the fur, within sebaceous glands, and in saliva. FeId 1 survives well in the domestic environment, and has been detected in homes 10 years after a cat was last present, (Peat et al 1991).

- **Indoor exposure to formaldehyde, volatile organic compound** and **house dust mite** significantly increased the risk of having asthma, (Rumchev 2004).

- **Environmental tobacco** smoke (ETS) contains over 4000 compounds including several carcinogens, irritants, and toxic agents. There is convincing evidence of parental smoking causing asthma in children, but the evidence on (ETS) exposure and development of adult asthma is limited, (Jaakkola 2000). This question is of major public health relevance, as the occurrence of both (ETS) exposure and asthma is relatively common in working place, (Thorn et al 2001). A study conducted on the effect of (ETS) and asthma in adulthood, indicating an increased risk of asthma in relation to (ETS), (Jaakkola et al 2004).The same study provides evidence of the effect of (ETS) exposure on development of asthma in adulthood, both workplace and home (ETS) exposure seem to be of importance. The adverse effect of cumulative workplace exposure seems to be strong, but

from a preventive point of view it is also important that past – year (ETS) exposure has a great effect on people's risk developing asthma and this study indicates that (ETS) is an important preventable cause of asthma in adulthood, (Jaakkola et al 2004).

1.5.3. Smoking

There has been well – known association between tobacco smoking and chronic obstructive pulmonary disease. The Piipari study, within its design aspects, suggests smoking to be an underestimated contributing factor to asthma development, (Piipari et al 2004). A review paper, further strengthens the argument that smoking produces adverse effects in the airway of asthmatic individuals, (Thomson et al 2004).

1.5.4. Diet and drugs

The occurrence of asthma and allergy are related to lifestyle factors, dietary pattern may be one of the contributing factors. Analysis of the first nutrition and health survey in Taiwan indicates that protein – rich and fat – rich foods of animal origin were associated with a higher prevalence of asthma in teenagers, (Huang et al, 2001). According to Thorn, antioxidant nutrients, especially vitamin C and E, Selenium, and Zinc appear to be necessary in asthma treatment, (Thorn 2001). There is a convincing evidence that body mass index (BMI) has increased in the last 10-30 years in developed countries. A rise in the prevalence of asthma in these countries seems to have occurred over the same time period, (Turn bull et al 2004). BMI has been associated with asthma symptoms and severity in a large number of studies of adults, (Scachter et al 2001 and Jarvis et al 2002) and children (Castro et al 2001), although in some populations the associations is limited to girls (Fegueroa et al 2001), and women, (Chen et

al 2002). An ecological analysis was performed to measure international association between paracetamol sales and atopic disease prevalence in children and adults. Published data from ISAAC and ECRHS were used. (Paracetamol sales were high in west European countries, and were positively associated with asthma symptoms, eczema and allergic rhinoconjunctivitis in children (ISAAC) and with wheeze diagnosis asthma, rhinitis and bronchial responsiveness in adults (ECRHS), (Newson et al 2000).

A limited number of worldwide studies have provided estimate of the prevalence of aspirin intolerant asthma (AIA) that ranges from 1-2 up to 20%, (Hedman et al 1999). The prevalence of respiratory symptoms triggered by aspirin, Non –Steroidal Anti – Inflammatory Drugs (NSAIDs) use was found to be 10 –11 % in patients with asthma and 2.5% in non – asthmatic, (Vally et al 2001).

1.5.5. Environmental and occupational exposure

In subsequent analyses of combine ECRHS data set, a higher risk factor for asthma was found in farmers, painters, plastic workers, cleaners and agricultural workers. Working as a cleaner increased the risk of asthma by > 30%. After creating a job exposure matrix, asthma was found to be associated with high dose exposure to biological and mineral dust, as well as exposure to gases and fumes. The proportion of asthma attributed to occupational exposure was estimated to be 5-10%, (Kongevinas et al 1999). Air pollutants can be broadly broken into photochemical oxidants (ozone and NO_x), sulphur dioxide and SO2 particulate complexes, acid aerosols (such as sulphuric and nitric acid) and particulates. Several epidemiological studies revealed a concomitant increase in the prevalence

of allergic disease with the number of vehicles on the road, during the past 40 years. The global vehicular fleet has expanded 10- fold, and investigators have predicted that the number of vehicles will increase even further during the next 20-30 years. Estimation by the United Nations indicates that more than 600 million people who live in cities and towns world wide are exposed to unhealthy and dangerous levels of motor – vehicle –generated air pollutants, (Braun – Fahrland et al 2004).

1.5.6. Genetic factor

ADAM33 was the first major novel gene associated with airway remodeling and airway hyper responsiveness in asthma. ADAM33 were located at chromosome 20 p13. There are other regions which were Previously identified on chromosome 5q31-33, 9q, 11q, 12q, 14q, 20q, 21q. Identification of ADAM33 will open new ways of treating asthma, the potential benefit may be – identification of persons at risk of asthma, and provide opportunity for early prevention such as allergen avoidance or early introduction of medication; Protein products of these genes are potential drug targets, opening the way to causative rather than symptomatic treatment in the form of anti–inflammatory and bronchodilator drugs, (Dr. S.K. Agarwal and Dr. J.K. samaria 2002).

Deficiency of platelet - activating factor (PAF) acetylhydrolase is another important factor. There are evidences that several genotypes contribute to PAF acetlyhdrolase and predispositions to asthma, including a novel compound mutation (279F\Q281R) which results in the loss of PAF acetylhdrolase activity and that expression of the Q281R cDNA resulted in the production of protein without enzymatic activity, (Stafforini et al 1999).

1.5.7. Family history

A study confirmed earlier data that parental history of asthma and allergy is most strongly associated with early – onset persistent asthma and suggested that among genetically predisposed children, an early – life environmental exposure, maternal smoking during pregnancy, favors the development of early – onset asthma that persists into later early childhood, (James et al 2001).

1.5.8. Rhinitis

A higher prevalence of asthma in subjects with reported nasal allergy was found in several analyses of local data. The association between perennial rhinitis and asthma was analysed using the combined European Community Respiratory Health Survey (ECRHS) database. Subjects with perennial rhinitis were more likely to have current asthma and bronchial hyper responsiveness (BHR) than subjects without perennial rhinitis.The association between perennial rhinitis and asthma remained significant after adjustment for possible confounders such as atopy, and was found in both atopic and non atopic subjects, rhinitis was also found to be an independent risk factor for onset of asthma, (Laynaert et al 1999).

1.5.9. Gender

Females had a lower risk of asthma with onset before 15 year of age but a higher risk of adult onset asthma than males, (Demarco et al 2000).

1.5.10. Socioeconomic status

The association between socioeconomic status and respiratory health has received little analysis; kigevinas reported that in the Spanish centers, bronchitis was more common in unemployed than employed subjects were,

even after adjusting for smoking, lung function and indoor risk factor, (Kigevinas et al 1998).

1.5.11. Disease and infection

The role of0 current or recent infections have been analyzed on local data from three centers. In Uppsala, subjects with serological signs of a current or recent Chlamydia pneumonia infection were more likely to have reported wheeze than subjects without infections. A correlation was also found between titers of Chlamydia pneumonia immunoglobulin – an (IgE) antibodies and bronchial responsiveness (Ferrari et al 2000). No association was found between tuberculin reactivity and total serum IgE and specific serum IgE levels, (Omenaas et al 2000).

1.5.12. Childhood risk factor

Delaying the introduction of milk other than breast milk until at least 4 months of age may protect against asthma and atopy later in childhood. These findings are relevant to our understanding of the cause of childhood asthma and also to public health. Although further studies and analyses are required to confirm these benefits and to understand better the mechanisms concerned, public health interventions promoting an increased duration of exclusive breast-feeding may help to reduce the morbidity prevalence of childhood asthma, (Odd et al 1999). Exposure of children younger than 1 year, compared with aged 1-5 years, to stables and consumption of farm milk was associated with lower frequencies of asthma, hay fever and atopic sensitization, (Riedler et al 2001).

1.6. Asthma

Asthma is a chronic respiratory disease characterized by episodes of

attacks or inflammation and narrowing of small airway in response to asthma "trigger". Asthma attacks can vary from mild to life – threatening and involves shortness of breath, cough, wheezing, chest pain or tightness, or a combination of these symptoms. Many factors can trigger an asthma attack, which include allergens, infections, exercise, abrupt changes in the weather, or exposure to airway irritants, such as tobacco smoke, and diseases such as gastro esophageal reflux disease. Symptom pattern can vary as duration, severity and frequency, (The Cleveland clinic 2004).

1.6.1. Types of asthma

1. Work – related asthma

In 1995, the American college of chest physicians published a consensuses statement classifying types of asthma found in the work place. Occupational asthma is defined as a disease characterized by variable airflow limitation and \ or bronchial hyper – responsiveness due to causes and conditions attributable to a particular working environment and not to stimuli encountered outside the work place. Work – aggravated asthma is defined as concurrent asthma worsened by nontoxic or physical stimuli in the work place, (Yeung 1995).

2. Exercise–induced asthma (EIA), or exercise–induced bronchospasm

Defined as a condition in which exercise or vigorous physical activity triggers acute bronchospasm in persons with heightened airway reactivity. It is observed primarily in persons who are asthmatic but can also be found in patients with atopy, allergic rhinitis, or cystic fibrosis, and even in healthy persons. (EIA) is often a neglected diagnosis, and the underlying asthma may be silent in as many as 50% of patient, except with exercise.

Exercise, particularly running and cold weather exercise, induces asthmatic reactions in about 17 million Americans, (J Resp Dis 2002).

3. Asthma in pregnancy

Asthma is the most common condition that affects the lung during pregnancy; about 4 percent of pregnant women have asthma. With good asthma treatment during pregnancy, most women can breathe easily, stay healthy, have a normal pregnancy, and give birth to healthy baby, (Annesi et al 2001).

1.6.2. Complications of Asthma:

In most stages, asthma is a reversible condition, which means symptoms and airway flow obstruction significantly improve with treatment. Conversely, in a small percentage of asthmatics, the airway obstruction doesn't reverse, and these patients end up with chronic obstructive pulmonary disease (COPD), chronic bronchitis (CB) or Emphysema, (Silva, 2004**)**.Complications associated with most medications used for asthma are relatively rare, however, in those patients requiring long – term corticosteroid use, complications may include osteoporosis, immuno suppression, cataracts, weigh gains, psychiatric disorders, diabetes, a vascular necrosis, (Djukanovic 1992). The risk of these complications is far less with inhaled corticosteroids than with oral corticosteroids. Nevertheless, in patients with moderate or severe asthma whose disease has been well controlled with high – dose inhaled corticosteroids, every efforts should be made to reduce the dose to as low as possible while maintaining good asthma control and minimizing the risk of exacerbations, (Djukanovic 1992)**.**

1.6.3. Disability

Asthmatics adapt their lifestyle to accommodate their asthma. In addition, they do not lead a "normal" life, (CDC, 1998). Over 12.7 million working days are lost due to asthma each year. 42 % of people with asthma say that traffic fumes stop them from walking and shopping in congested areas. 40% of people with asthma avoid smoky pubs and restaurants, up to 56 % of people with asthma are sensitive to pet allergens, and up to 90% of people with asthma are sensitive to house dust mites, (Asthma UK2004). 61% of all asthma patients and 73% of children report that they limit sports participation or exercise, find it difficult to sleep through the night, and make unplanned trips to physicians, (CDC 1998)**.**

1.6.4. Asthma mortality

Asthma mortality is associated with multiple factors, including delay in care, poor compliance, and lack of access to health care, theophylline toxicity, and overuse of B – agonist medications, (Siptzer et al 1992)**.** Speculation about the recent decline in asthma deaths has pointed to the more judicious use of prophylactic treatment, particularly inhaled steroids, (Goldman et al 2000).On average, 1 .400 people die from asthma each year in the UK, (Asthma UK 2004). The asthma mortality rate in Israel during the years 1980 to 1997 was low, stable, and there was no difference in the asthma death rate and place of death between Jews and Arabs, suggesting that in this population, genetic predisposition is not likely to be a risk factor for mortality, (Picard et al 1997).

1.6.5. Asthma management

A patient's history includes frequency and severity of symptoms that occur with activities of daily living.The expert report 2 was issued in 1997

further refined effective asthma management based on the following components: (1) Objective measure of lung function (2) Environmental control measures (3) Comprehensive pharmacologic therapy, and (4) Patient education. See table 1. (National asthma education and prevention program: expert panel report 2: 1997).

Table (1) Graphics Guide to Asthma Severity

Indication	**Disease Level**		
	Mild	**Moderate**	**Severe**
Symptoms with activity	With heavy exercise only , e.g. running or cycling.	With mild exercise, e.g. climbing stairs rabidly, carrying groceries	With minimal exercise. e.g. walking on level quickly.
Nocturnal awakenings	1–2 per month.	1 – 2 per week.	More than twice per wk.
Lung functions	Normal most of the time. AM and PM peak flows vary less than 10 percent among and within days.	FEV1 * 60 to 75 percent of predicted. AM peak flow less than 85 percent of PM peak flow; wide day to day variability.	FEV1<60 percent of predicted. Peak flows rarely more than 70 percent of predicted with large day to day variability.
Medication use	Intermittent beta agonists.	Inhaled steroids (low does) regularly, beta agonists as needed.	Multiple asthma medications on a regular basis.
			Including inhaled steroids at moderate to high dose.

1.7. Rhinitis

Rhinitis is inflammatio1.n of the membrane tissue in the nose, causing sneezing, a runny nose, and sense of nasal obstruction. There are two major causes of rhinitis: an allergy called "allergic rhinitis ", and an over activity of the nerves in the nasal tissue called "vasomotor rhinitis", (Scoppa, 1996).

1.7.1. Classification of rhinitis

1. Atopic rhinitis: there are three types of atopic rhinitis.

A) Seasonal allergic rhinitis (also known as hay fever). This is triggered by allergy to pollens, including trees in spring, grasses in summer, and weeds in fall, symptoms include sneezing, itching, tickling in the nose, runny or stuffy nose, and watery or itchy eyes. Seasonal rhinitis is diagnosed primarily by medical history, (Durham, 1998)**.**

B) Perennial rhinitis (year – round) **with allergic triggers**

These triggers include indoor allergens such as mold, house dust mite, cockroach and animal dander. Foods commonly eggs, cows milk and peanut can be triggers. Symptoms are the same as seasonal allergic rhinitis but are experienced throughout the year, (MacKay and Durham, 1998).

C) Perennial rhinitis with non – allergic triggers, this type of rhinitis

Is not well understood. Although not triggered by allergy, it's an allergic like condition with increased eosinophils (a special type of white blood cell associated with allergy) in the lining and secretions of the nose. Symptoms are the same as perennial rhinitis with allergic triggers, diagnosis is determined from negative skin tests and a nasal smear test positive for eosinophlis, nasal polyps can be a complication of this condition, (MacKay and Durham, 1998).

2. Vasomotor rhinitis

Vasomotor rhinitis is caused by over activity of nerves in the nasal tissue, this can occur when emotionally upset, irritated by certain air temperature and humidity conditions (chilly weather, dry air from air – conditioning,

sudden changes in temperature or humidity)**,** during pregnancy, and during bacterial and viral infections, it can also be induced by drugs such as alcohol, anti hypertensive agents, aspirin, oral contraceptives, chemicals (cosmetics, smoke, noxious fumes) and from over use of decongestant nasal drops or sprays.

Food induced rhinitis (gustatory rhinorrhea) may occur during consumption of hot and spicy foods, (MacKay and Durham1998). The national institute of allergy and infectious disease, (NIAID) estimates that**"** the number of people suffering from allergic rhinitis may be as high as 35 million. Allergic rhinitis may not seem dangerous in it self, but it can play a role in other diseases like asthma, and sinusitis, (NIAID 2002).

1.7.2. Complications of Allergic Rhinitis

Allergic rhinitis has a strong association with asthma, (Laynert et al, 1999). Another commonly associated condition is nasal polyps, which are growths of skin in the nasal tract that can cause obstruction and loss of smell and sinus and ear infection, (Dr. Josef Smith, 2005).

Allergic rhinitis also results in bad breath, a husky voice and sore throats, it worsens snoring and the tendency to sleep apnea in adults, it causes abnormal development of the mouth and teeth from chronic mouth breathing. The result is often in a high arched palate, crowded teeth and high dental costs, and results in eye infections because people rub itchy eyes. Some will even become allergic to eye drops of the preservative in the bottle, (Spector, 1999).

1.8. Food allergies

Food allergies are an abnormal response of the body to a certain food. It is important to know that this is different than a food intolerance, which does

not affect immune system, although some of the same signs may be present, (Bindsley, 1998). Allergic reactions to food are IgE – mediated or non – IgE mediated, which in turn, lead to a spectrum of clinical symptoms observed in persons with allergic reactions to food, (Altman and Chiaramont 1996). Only about 1.5 percent of adults and up to 6 percent of children younger than 3 years in the US– (about 4 million people) has a true food allergy, according to researchers who have examined the prevalence of food allergies (Altman and Chiaramont 1996). It is critical for people who have allergies to identify them, and to avoid foods that cause allergic reactions. Some foods can cause severe illness and, in some cases, a life threatening allergic reaction (anaphylaxis) that can constrict airways in the lungs, severely lower blood pressure, and cause suffocation by the swelling of the tongue or throat. An estimated 150 American die each year from severe allergic reactions to food, (Sampson, 1998). Peanuts, tree and shellfish are usually implicated in food – induced anaphylactic reactions while risk factor for food – induced anaphylaxis include (1) the presence of asthma , especially in patients with poorly controlled disease ; (2)previous episodes of anaphylaxis ; and (3) a delay or lack of immediate use of emergency medications (e.g. epinephrine, antihistamines) to treat the allergic reaction (Sampson, 1998). According to the national institute of allergy and infectious disease, it does not take much of the food to cause a severe reaction in highly allergic people. In fact, as little as 1/44.000 of a peanut kernel can cause an allergic reaction for severely allergic individuals, (Bindsley 1998). Allergic symptoms may begin within minutes to an hour after ingesting the food. Symptoms may include: vomiting, diarrhea, cramps, hives, swelling, eczema, itching or swelling of the lips, tongue, or mouth, itching or tightness in the throat,

difficulty breathing, wheezing, asthma, loss of consciousness and death, (James 1996).

1.9. Stinging insect allergy

Insect stings usually cause transient local inflammation; however, allergic hypersensitivity can result in more severe local reactions or generalized systemic reactions. Large local reactions are usually late – phase IgE mediated allergic reactions, with severe swelling (eight to 10 inches in diameter) developing over 24 to 48 hours and resolving in two to seven days. Systemic reactions also are IgE mediated and may cause one or more signs and symptoms of anaphylaxis, including generalized urticaria, angioedema, throat tightness, dyspnea , dizziness, and hypotensive shock, (Yunginger,1998).The stinging insects that commonly cause severe allergic reactions include bees (honey bees, bumblebees), vespids (Vespidae family : yellow jackets, hornets, wasps), and fire ants (solenopsis genus), (Yunginger, 1998).

Systemic reactions to insect stings are estimated to occur in 3 percent of adults; approximately 1 percent of children have medical history of severe sting reactions, (Golden 2003). Venom skin tests and immunotherapy are indicated in patients with a history of systemic allergic reaction to an insect sting, patients with a history of systemic sting reactions and positive venom skin tests have been found, on average, to have a 50 percent risk of experiencing another systemic reaction to a challenge sting (i.e. high risk of anaphylaxis), (Golden 2000).

Morbidity and mortality from insect sting anaphylaxis can be virtually eliminated by appropriate patient education about the risk of recurrent

reactions and the use of preventive and protective measures. Epinephrine is the treatment of choice for acute anaphylaxis, venom immunotherapy is recommended for use in patients who are at risk for severe systemic reactions to future insect stings, (Golden 2003).

1.10. Anaphylaxis

Anaphylaxis is a term used to describe serious and rapid allergic reactions usually involving more than one part of the body, which if severe enough, can cause death, (Anaphylaxis campaign 1997).

1.10.1 Common causes of Anaphylaxis:

1) Food: especially nuts, some kinds of fruit, fish and less commonly Spices, (Sampson, 1998).

2) Drugs: especially penicillin, anaesthetic drugs, some intravenous infusion liquids, and contrast media used during **X** – rays. Aspirin and NSAIDs can produce very similar reactions, (Med, 1993).

3) Latex: Mainly in rubber, latex gloves, catheters, other medical products, but also in many things encountered in daily life. Sufferers are nearly always health care workers, mainly nurses, or have other occupational contact with latex, (Anaphylaxis campaign 1997).

4) Bee or wasp (yellow jacket) sting when these cause faintness, difficulty in breathing, or rash or swelling of a part of the body, which has not been, stung, (Golden 2000).

5) Idiopathic anaphylaxis (Anaphylaxis campaign 1997).

6) Exercise may precipitate such reactions in some (exercise–induced

anaphylaxis), and so may exercise after food, sometime apparently irrespective of what the food is, but in other people after specific foods. This is called "exercise – induced food – dependant anaphylaxis ".

Individuals at risk for experiencing exercise – induced anaphylaxis are those with a history of personal or family atopy, (anaphylaxis campaign 1997).

1.10.2. Signs and Symptoms of Anaphylaxis

- Faintness and unconsciousness due to very low blood pressure
- Swelling (angioedema)
- Swelling in the throat, causing difficulty in swallowing or breathing.
- Asthma symptoms
- Vomiting
- Cramping abdominal pains
- Diarrhea
- Tingling feeling in the lips or mouth if the cause was a food such as nuts.
- Death due to obstruction to breathing or extreme low blood pressure (anaphylactic shock), (Allergy clin immunol, 1998).

1.11. Eczema

Eczema, or dermatitis as it is sometimes called, is an inherited skin sensitivity that can be easily irritated by many factors including, stress, water, some foods, irritants like soap and chemicals, allergic reactions, cats, wool, infections and many others factors. Individuals with eczema often have a family history of allergies, asthma, eczema, and hay fever.

Eczema patients are more likely to have severe reactions to bee, some drugs like penicillin and some foods. The severity can range from hot, dry and itchy skin to open, broken, and bleeding sores. Eczema affects more than 10 million Americans, (Wuthrich, 1996). Atopic dermatitis often occurs with allergies and frequently runs in families in which other family members have asthma or hay fever. It usually begins in infancy and may vary in severity during childhood and adolescence. It tends to become less of problem in adulthood, unless patients were exposed to allergens or irritants in the workplace. The exact cause of this disorder is unknown, (www. hon. html).

1.11.1. Complications:

Loss of sleep and energy, social isolation and difficulty with aspects of daily living can lead to severe disability, (Greaves, 2000)**.**

1.11.2. Management

Because atopic dermatitis (AD) may be the entry point for the development of subsequent allergic disease, it is essential that clinicians across a spectrum of disciplines recognize that AD management must include comprehensive concerns about asthma, allergic rhinitis, and food allergy. Physician education and dissemination of the least clinical findings are needed to raise awareness of the importance of AD management. The proper treatment of AD may prevent the progression of greater IgE production and the reaction in the skin, lungs, and nose, (Hanifin, 1999).

1.12. Allergic conjunctivitis

It is defined as irritation of the conjunctiva that covers the eye ball and the inside of eyelids which lead to itchy, redness, swollen or even watery hurt

eye.This allergic reaction usually is caused by animal skin and secretions, grass and ragweed , air pollution and smoke, skin medicine, perfumes, and cosmetics, and viral and bacterial infections, (Stephen ,1998).

1.12.1. Management

Identification and avoidance of the allergens that cause symptoms is a protective way against allergic conjunctivitis. (Stephen, 1998).

1.13. Drug allergies

According to a recent study published in the journal of the American medical association, there are approximately 550.000 serious allergic reactions to medications per year in hospitals throughout the United States, (Lazarou, 1998).

It is unclear how prevalent drug allergies are among the general population but allergic reactions to medications cause the highest number of documented deaths from anaphylaxis each year. Penicillin alone is responsible for about 5.440 cases of fatal anaphylaxis each year, which account for an estimated 75% of the known annual US anaphylaxis deaths. Most deaths occur in people who have no medical history of allergic reactions. A voiding medication that triggers allergic reactions is still a mainstay in protecting patients against anaphylaxis, (Nugent JS et al, 2003).

1.14. Asthma and Allergy according to Palestinian Ministry of Health

Table (2) the number of cases of asthma and allergy according to Palestinian Ministry of Health records are as follows: (Palestinian ministry of health, Nablus**):**

Year	Age	Asthma, COPD,CB, Emphysema	Rhinitis	Sinusitis
2003	15-24	174	23	29
2004	15-24	127	31	22

Death due to asthma and allergy were not recorded.

The differences of cases between tow years were due to the current intifada, where our people are exposed to different kinds of war gases, destruction, tire burning due to Israeli occupation which in turn affect the health of population, and could be an obstacle for higher education, and health care provision, which be explained by political circumstance, and its reflection of closuring between cities**.**

1.15. Cost of allergy

Allergic conditions cost the NHS one billion pound (£) a year according to a new report. The study by scientists at Edinburgh University and St George's hospital medical school in London revealed that 39% of children and 30% of adults have been diagnosed with an allergy, including asthma. Treating allergies accounted for 10% of primary care prescribing bills, according to the researches, and overall amounted to more than one billion of the NHS budget, when the costs of GP consultation, hospital stays and medicines are included, (Asthma UK 2004). "The study underline the urgent need for a concerted effort to understand the causes and treatments of asthma and allergy, and to provide better standard of care for those who are in need ", (Dr Matt Halls worth, 2005).

1.16. Prevention

The asthma and allergy research institutes objectives aimed to promote prevention and best practice in asthma and other allergic and respiratory diseases by providing community and professional education. (Asthma and Allergy research 2004).

The first step in management once allergy has been diagnosed is allergen avoidance. Nowadays most people spend more than 90% of their lives indoors. Over the past 30 years, the home environment has changed enormously with the introduction of soft furnishings, fitted carpets, and central heating. Indoor ventilation has decreased – the rate at which indoor air is exchanged for fresh air now 10 times lower than it was 30 years ago, with a considerable increase both in humidity and in concentrations of indoor pollutants and airborne allergens. As exposure to allergens is an important cause of symptoms in sensitized patients, reducing exposure should improve disease control, (Wood Cock and Custoric, 1998).

1.16.1. Strategies for reducing exposure to allergens

- Remove upholstered furniture from the bedroom. Wash bedding and nightclothes in hot water (at least 130 F°) at least once a week.

- Decrease household humidity to less than 50 percent removes humidifiers and check air conditioning units regularly for mold contamination.

- Encase mattress, box spring and pillow in mite – proof covers minimize dust, and pollen – collecting surfaces (e.g. shelving, stuffed animals, and books).

- Minimize use of indoor ceiling fans.

- Use blinds or washable curtains with shades and clean them often. And apply an acaricide such as benzyl benzoate, or denaturing agent, such as tannic acid (3%). to carpet, especially in the bedroom.

- If possible, remove carpet from the bedroom.

- Avoid vacuuming when dust – sensitive persons are at home.

- Keep pets outside or at least out of bedrooms and of upholstered furniture.

- Give pets their own washable beds and wash the beds often.

- Bathe or shower before bedtime to remove pollen from hair and body.

- Remove visible mold from walls and floors using a solution of water and chlorine bleach, or product that contains chlorine or other fungicides.

- To control insects particularly cockroaches, wash dishes promptly. Keep garbage closed containers outside of the home, remove or repair sources of water (e.g. leading faucets, standing water in basements). Wipe up food spills and keep food in tightly sealed containers.

- Stop smoking, (National asthma education and prevention program ,2002)

1.16.2. Benefit of Allergy Prevention

The effect asthma and allergy on an individual's quality of life and the extent to which it may restrict daily activities is often overlooked. Yet, it is an important part of understanding this condition and the benefits that

effective treatment can bring.

Controlling allergies can significantly decrease health care cost as follows:

1) Allergies are the 6 th leading cause of chronic disease in the United States costing the health care system $ 18 billion annually, (AAAAI 1996 - 2001).

2) Health care provider visits for contact dermatitis and other eczemas, which include atopic dermatitis, are 7 million per year. (CDC 1996).

3) In 2002, approximately 14 million office visits to health care providers were attributed to allergic rhinitis, (CDC 2004).

4) An estimated 75% of admissions for asthma are avoidable and as many as 90% of the deaths (1.400) from asthma are preventable, (Asthma UK 2004).

1.17. Treatment

The purpose of asthma and allergy treatment is to manage the disease in order to live as normal a life as possible. This requires being well educated about the disease and being an active player in managing it, (Asthma and Allergy research 2004). A number of different types of medicines are useful in treating asthma, but not all asthma medicines are appropriate for every patient. Table (3) summarizes different methods of treatment for allergies, (Cross et al 1998).

The successful treatment of asthma with immunosuppressive agents, such as cyclosporine A, and use of monoclonal antibody in the other chronic inflammatory conditions has suggested the use of a monoclonal antibody to CD4 in patients with severe steroid–dependent asthma. This approach

seems to be the sunrise in a new era in the treatment of allergic disorders, (Kon et al, 1998).

Table (3) Summery Of Approach for Treating Common Allergic Disorders

RHINITIS	CONJUNCTIVITIS	ASTHMA	ECZEMA	FOOD ALLERGY \ ANAPHYLAXIS
Allergen avoidance.	Allergen avoidance.	Allergen avoidance.	Allergen avoidance.	Allergen avoidance (may be life saving).
Antihistamine tablets or nasal spray.	Antihistamine tablets.	Bronchodilator inhaler as required.	Soap substitute and regular use of emollients.	Specialist referral (for all cases of anaphylaxis) and need for dietetic support.
Corticosteroid nasal spray (cromoglycate first line in children).	Cromoglycate or nedocromil eye drops.	Corticosteroid inhaler (cromoglycate or nedocromil are alternatives for patients with mild disease).	Corticosteroid skin creams and ointments	Consider need for standby adrenaline (refer to allergist).
Short course(e.g. prednisolone 20mg \day for 5 days , peak season).	Never use corticosteroid eye drops without advice \ supervision ophthalmologist.	Consider adding regular long acting inhaled bronchodilator (or theophylline tablets.	Antibodies for exacerbations.	
For severe hay fever to allergist for consideration for immunotherapy.		Prednisolone tablets once daily in morning in lowest possible dose courses may be required at any time for exacerbations.	Referral to dermatologist for consideration of skin wraps , behavioral therapy , and (rarely) prednisolone tablets.	Consider immunotherapy (In allergy to bee or wasp venom) refer to allergist.

1.18. Public health challenges

Asthma, allergic rhinitis, and atopic dermatitis are leading causes of chronic diseases in developed countries, (Eupton et al 2000). Prevention and treatment of asthma and allergy, mortality, morbidity and disability caused by asthma resulted in a towering public health challenges for the United States, (Asthma UK 2004). These challenges are considered global and can be adopted in the Middle East region; including Palestine, as such studies indicate that there are numerous problems and major gabs in the provision of optimal health care in the Middle East region because;

1) There are few (standard management protocols and clinical practice guidelines on the management of asthma, particularly in primary health Care)**,** (Partridge and Alwan, 1997).

2) Inadequate education, make patients deny the diagnosis of asthma and are not prepared to accept it, with serious negative implications for the prospects of good control and favorable prognosis.

3) Lack of compliance seems to be a major problem in the region. Although unaffordable treatment costs are undoubtedly a major factor, insufficient education and impaired communication are probably the most important causes.

4) Standardization and initiation of epidemiological studies to assess the size of the problem of asthma throughout the region are needed and this may involve use a standardized methodology to obtain information about the prevalence of asthma in different regions.

5) Basic health care requirements for people are often inadequate in many countries of the regions and national initiatives for the prevention and

control of this problem are generally lacking, serious steps for adoption of strategies for the primary health care of asthma must be taken.

6) The increase in prevalence of asthma over the past two to three decades is unlikely to be explained by a change in genetic constitution and more likely reflects environmental changes leading to condition being activated in an increased number of genetically susceptible people, environmental factors should have been systematically investigated to decrease the rise of allergic disease.

7) People are not empowered to share responsibility in managing and monitoring their problem, and there are few organized educational programmes for those affected and their families. In most countries of the region, educational material for people with asthma and their families is either unavailable or grossly deficient. There may be no access to the essential tools for treatment such as drugs, especially at the primary health care level. In many countries, the cost of treatment is too high for people to afford, leading to discontinuation of treatment and poor follow – up. The lack of appropriate health care at the primary health care level probably leads to under diagnosis, especially among children.

8) Physicians being reluctant to label patients as asthmatic. Doctors falsely reassuring mothers that their children will grow out of asthma and negative cultural attitudes, sometimes also shared by pharmacists and other health care professionals, towards the use of inhalers, (Partridge and Alwan, 1997).

1.19. Aim of the study

- The purpose of this study is to estimate the prevalence of asthma and allergy among young adult population in Palestine represented by An-Najah University students in Nablus.

- To investigate the relationship between asthma and allergy and risk factors related to these diseases among the study population.

- To find the most common triggers that may cause or worsen symptoms of asthma and allergy among the study group.

- To explore the profile of students who have asthma or allergy.

- To estimate a peak expiratory flow for Palestinian young adult depending on Persian prediction equations and spotting the light about the need for a local reference value for Palestinian adult.

- To inform authorities on health condition among young adult population in Palestine.

1.20. Research hypothesis:

- Prevalence of asthma and allergy among An – Najah University students to be relatively high.

- Presence of asthma and allergy risk factors among An-Najah University student to be high.

- There is association between risk factors and asthma, allergy among An-Najah University students.

- Adoption of Nunn & Gregg equation for PEF may perform well for Palestinian adult.

CHAPTER TWO

METHODOLOGY

Methodology

2.1. Introduction

Nablus district is located in the northern part of the West bank, it is bounded by Jenin from the north; Tulkarm from the west; Ramallah and Jericho from the south and the Jordan river from the east, (ARIJ 1996). The geographical position of Nablus district in the northern part of west bank gives it a comparatively a low temperature range, (Nablus municipality, 2002)**.** Located in Nablus, An–Najah National University which is currently the largest University in the West Bank, with 16 colleges and 12500 enrolled students, (Public relation Department 2005).

2.2. Population of the Study

The study population was chosen from An–Najah university in Nablus. The study sample consisted of total 1000 randomly selected students from all colleges of the University whether scientific, humanitarian, or community college. The percentage of students in the sample was representing the percentage of students in each college. The age of the students was at range of (18-27). Both males and females were included in almost equal percentage.

2.3. Data Collection

Data were collected during the period of the first of September 2004 to the end of December 2004, using structured interview and lung function measurement by measuring the peak flow meter. Doctor Shashi Kumar has designed our questionnaire that was adopted and used in the interview. It was translated, evaluated, and reviewed by specialized physicians. A pretest was carried out on 30 students to find the capacity of student to

understand the questionnaire wording then the questionnaire layout was modified after the pilot testing. A total of 1116 questionnaire forms were distributed, the total response rate in this study was 90 % (1007) questionnaire were returned.

2.3.1. Questionnaire Component

The questionnaire spotted lights on several parts that play important role in triggering asthma and allergy, refer to appendix (1) for full information about questionnaire. The following are important components of the questionnaire:

1. Sociodemographic Questions

Q1. Was about social history including age, sex, college, weight, sport, and smoking.

Q2. Was about environmental history including residence, trees, allergen, inside the home, type of cooling, type of heating, indoor animal and type of pillow.

2. Asthma And Allergy History

(Q3-Q11): Were about triggers that cause or worsen the subject symptoms including exercise, respiratory infections, weather changes, foods. The symptoms included nasal, sinus, eyes, chest, eczema, asthma and allergy problem (frequency and severity), and health problem other than asthma and allergy**.**

3. Family History

Q12: covers the presence of family history for allergy.

2.3.2. Experimental Part: Peak Flow Meter

Pulmonary function tests (PFTs) are used for confirmation of diagnosis, staging, and predicting prognosis in patients with COPD and asthma. The standard PFTs is the forced expiratory spirogram in which a patient inhales to maximal lung capacity (Total lung capacity) and exhales forcibly as much as possible (to residual volume). Values of exhaled lung volume versus time are recorded, (Jenkinson and martin 2003).

Peak expiratory flow (PEF) is the maximum flow achieved during an expiration delivered with maximal force starting from the level of maximal lung inflation. The value obtained may differ depending upon the physical properties of the instrument used to measure it, (Eur Respir J 1997)**.** In October 1990, mini peak flow meters were made available on prescription in the United Kingdom, in response to several years of campaigning by the medical profession and the national asthma campaign for the wider use of what was regarded as a crucial instrument in asthma control. The device has been thoroughly validated as an accurate measure of peak expiratory flow rate, which is highly correlated with other measures of pulmonary function; predictive values for flow rate have been calculated. Furthermore, the device is inexpensive, simple to use, and easy for patients to understand. While spirometry remains the usual method of assessing pulmonary function in hospital practice, peak flow meters have become widely used in the management of patients by general practitioners. Many patients are being given peak flow meters to take home, or are acquiring them themselves, and the British thoracic society has recommended the use of home recording for good asthma management**.**

There is good evidence that PEF, measured with a hand – held peak flow

meter, is both reliable and reproducible. A recent report suggests that PEF may be more reproducible than FEV1, (Quanjer et al 1997).

2.4. Procedure

An agreement was obtained from An – Najah public health department, to facilitate the researcher's work including students interviewing and PEF measurements. The rate of researcher's visit to the university was four visits each week, interviewing and measuring PEF for about 26 students each day. The purpose of the study was explained to each group: First, the researcher interviewed group of students and asked them to fill the questionnaire, then PEF measurement was done between about noon and early evening to reach maximal values**,** (Brand et al 1997). Based on the expert panel report 2 (guideline for the diagnosis and management of asthma 1997) as follows: The student was asked to

- Stand up
- Slide indicator to base of meter
- Take in deep breath
- Place mouthpiece in mouth and seal lips around it.
- Blow out as hard and fast as he/she can (one quick blow)
- Process was repeated 2 more times
- The highest number of the three efforts was recorded.

Since PEF is influenced by a subject's sex, ethnic origin, age, stature, pathophisiological and physical factors, the results were recorded**,** and level of error was corrected for by using the following equation for PEF derived by (Miller et al 1992).

$PEF_{Corrected} = 0.00090 \text{ X } (PEF_{recorded})^2 + 0.373 \text{ X PEF recorded} + 47.4$

The following new revised prediction equations for PEF which was revised by Nunn and Gregg are applied to get predicted value and then calculate percent of predicted value by dividing corrected value/ predicted value *100.

Men:

Ln (PEF) = 0.755 ln(age) - 0.021 age - 104.1/ht + 5.16

Women:

Ln (PEF) = 0.486 ln(age) - 0.016 age - 76.8/ht + 5.43

Where ln(x) is the natural logarithm of x, age is in years and ht is height (cm), (Nunn and Gregg 1989).

Moreover, as Lung function is known to vary with ethnicity. It is, therefore, important to establish normative values relevant to the ethnic characteristics of local populations (Yap et al, 2001). In this study we used equations for normative lung function values for the Persian population (Golshan et al ,2003), Which in comparison with reference equations based on European or USA populations, Persian reference values are more biologically and technically suitable for the interpretation of PEF results for Palestinian populations.

Predicted values were calculated for each individual with the equations used in the persian study, and the equations of Nunn and Gregg.

Table (4) Derived predicted equations for PEF measuring by Golshan et al, 2003.

Parameter	<21 yrs	≥21 yrs
$PEF^{¶}_{female}$	0.05460H+0.16758A–4.86417	0.06402H–0.0390A–1.607
Lower limit of normal	0.042137H+0.16758A–4.86417	0.051H–0.0390A–1.607
$PEF^{¶}_{male}$	0.07238H+0.246A–7.720	0.07759H–0.0435A–1.369
Lower limit of normal	0.058H+0.246A–7.720	0.061H–0.0435A–1.369

PEF: peak expiratory flow, H: height in cm, A: age in years, ¶: flows are in $L \cdot s^{-1}$

2.5. Data Analysis

All data of questionnaire and experimental part for 1000 students sample were entered into the computer and computed using SPSS program and applying Chi – square test, with 95 % level of significant (P value = 0.05).

2.5.1. Analysis of Descriptive Studies

Tables containing descriptive studies were obtained, such as sex, age, residence, BMI, environmental, social and living environment.

2.5.2. Analysis of Medical History

Tables for medical history were obtained, such as asthma and allergy history, asthma and allergy triggers, and PEF measurement.

2.5.3. Analysis of Relationship

Relationship between risk factors, triggers, and some disease with asthma and allergy among An–Najah University students were obtained, also relation ship between sex, age, BMI, residence, smoking, sport practicing and asthma with PEF measurement were obtained.

CHAPTER THREE

RESULTS

Results

3. The result of the study includes three main categories:

- Profile of the study population: anthropometric characteristics, general, health, social and living environment and risk factors profiles.
- PEF measurements.
- Relationships.

3.1. Profile of the study population

3.1.1. Anthropometric characteristics and General profile

Table (5) Gender, age, colleague, sports practicing

Gender	**Frequency**	**Percent%**
Male	448	44.8
Female	511	51.1
Missing system	41	4.1
Total	**1000**	**100**
Age	**Frequency**	**Percent %**
17.5-20	546	54.6
20.5-22	333	33.3
22.5-24	66	6.6
More than 24	25	2.5
Missing system	30	3
Total	**1000**	**100**
College	**Frequency**	**Percent%**
Scientific	348	34.8
Humanitarian	649	64.9
Missing system	3	0. 3
Total	**1000**	**100**
Sport practicing	**Frequency**	**Percent%**
Yes	514	51.4
No	428	42.8
Missing system	58	5.8
Total	**1000**	**100**

Table 5 shows the distribution of samples as follows:

- 44.8%of the study sample were males, 51.1% were females.
- 54.6% of the study sample was in (17.5-20) years old, 33.3 % were in (20.5-22) years old, 6.6 % were (22.5-24) & 2.5 were more than 24 years old.
- 34.8% were from Scientific College & 64.9% were from humanitarian college.
- 51.4%of the study sample practicing sports & 42.8% not practicing sports.

Table (6) Body mass index measurements profile of the study population

BMI categorized	**Frequency**	**Percent%**
Normal weight (less than 25)	723	72.3
Over weight (25 -29.9)	132	13.2
Obese 30 and more	22	2.2

- 2.2% of the study sample were obese, 13.2% were over weight, while 72.3 % had normal weight.

3.1. 2. Social profile

Table (7) Marital status, job, smoking, smokers in the house

M. Status	**Frequency**	**Percent%**
Married	43	4.3
Single	949	94.9
Missing system	8	0.8
Total	**1000**	**100**
Job	**Frequency**	**Percent%**
Employee	18	1.8
Worker	10	1
Not working	936	93.6
Missing system	36	3.6
Total	**1000**	**100**
Smoker	**Frequency**	**Percent%**
Yes	176	17.6
No	811	81.1
Missing system	13	1.3
Total	**1000**	**100**
Smoker in house	**Frequency**	**Percent%**
Yes	554	55.4
No	366	36.6
Missing system	80	8
Total	**1000**	**100**

- 4.3% of the study population was married & 94.9 % were single.
- 1.8%of the study population was employees, while 1% was worker & 93.6 % were not working.
- 17.6%of the study population were smokers, while 81.1%were not.
- 55.4%of the study population had smokers in house, while 36.6%didnot.

3.1.3. Place of living profile

The place of living profile of the study population included **(**place of living, living in university dormitories, how old is my house, the lay out of my house, kind of trees, kind of building, kind of heating instrument, kind of cooling instrument, kind of animals livings in house, kind of animals livings around the house, kind of pillow used, # of family in house, #. of rooms in house**).**

Table (8) (place of living, living in university dormitories, how old is my house, the lay out of my house, kind of trees, kind of building, kind of heating instrument, kind of cooling instrument, kind of livings in house, kind of livings around the house, kind of pillow, covering of the ground, no. of family in house, no. of rooms in house).

Place of Living	**Frequency**	**Percent%**
Camps	38	3.8
Village	550	55
City	410	41
Missing system	2	0.2
Total	**1000**	**100**
Living in Univ. dormitories	**Frequency**	**Percent%**
Yes	461	46.1
No	511	51.1
Missing system	28	2.8
Total	**1000**	**100**
How old is my house	**Frequency**	**Percent%**
Less than 20	602	60.2
20-50	324	32.4
More than 50	63	6.3
Missing system	11	1.1
Total	**1000**	**100**
The lay out of house	**Frequency**	**Percent%**
Factories	19	1.9
Fields	172	17.2
Crowded population	160	16
Quiet place	926	62.9
Missing system	20	2
Total	**1000**	**100**
Kind of tree	**Frequency**	**Percent%**
wooded	146	14.6
Fruitful	424	42.4
Roses	198	19.8
Other	201	20.1
Missing system	31	3.1
Total	**1000**	**100**
Kind of building	**Frequency**	**Percent%**
Stone building	534	53.4
Asbestos building	31	3.1
Block building	410	41
Missing system	25	2.5
Total	**1000**	**100**
Type of Heating	**Frequency**	**Percent%**
Electricity	194	19.4
kerosene	119	11.9
Gas	418	41.8

Coal	208	20.8
Central heating	30	3
Conditioner	13	1.3
Space heaters	8	0.8
Missing system	10	1
Total	**1000**	**100**
Cooling instrument	**Frequency**	**Percent%**
Fan	671	67.1
Conditioner	58	5.8
Windows of the house	265	26.5
Missing system	6	0.6
Total	**1000**	**100**
Animals living in a house	**Frequency**	**Percent%**
Cat	113	11.3
Dog	16	1.6
Birds	90	9
Chicken	108	10.8
Goats	52	5.2
Pigeons	128	12.8
Other	23	2.3
Nothing	451	45.1
Missing system	19	1.9
Total	**1000**	**100**
Animals living near the house	**Frequency**	**Percent%**
Cat	224	22.4
Dog	58	5.8
Horses	41	4.1
Chicken	126	12.6
Cows And Goats	228	22.8
Other	25	2.5
Nothing	165	16.5
Missing system	23	2.3
Total	**1000**	**100**
Kind of Pillow	**Frequency**	**Percent%**
Cotton	382	38.2
Spring	274	27.4
Feathers	48	4.8
Wool	243	24.3
Other	42	4.2
Missing system	11	1.1
Total	**1000**	**100**
# of family in house	**Frequency**	**Percent%**
3 and less	56	5.6
4-6	291	29.1
7and more	694	69.4
Missing system	9	0.9

Total	1000	100
# of rooms in house	**Frequency**	**Percent%**
2 and less	2	4.8
3	284	24.8
4	313	31.3
5	204	20.4
6 and more	180	18
Missing system	8	0.8
Total	**1000**	**100**
Cover of the floor	**Frequency**	**Percent%**
Carpets	751	75.1
Moqutte	141	14.1
No thing	101	10.1
Missing system	7	0.7
Total	**1000**	**100**

- 3.8%of the study sample was living in a camp, 55 % were living in a city & 41 % were living in a village.
- 46.1% of the study sample live in university dormitories, 51.1 % did not.
- 60.2% of the study lives in relatively new houses (less than 20 years). 32.8% live in houses 20-50years old, &3.6% live in old houses (>50 years old).
- 1.9% of the study sample had their houses near factories, 17.2% near fields, 16% in crowded population & 62.9% in quiet living place.
- 14.6%of the study sample had wooded trees around their houses, 42.4% had fruitful trees, 19.8 %had roses &20.1 % had other kinds.
- 53.4%of the study sample lived in stone building, 3.1% in Asbestos building & 41 %in block building.
- 19.4%of the study sample use electricity for heating, 11.9% used kerosene, 19.8 % used gas, 20.8% used coal, 3% used central heating, 1.3% used conditioner & 0.8 % used space heaters**.**
- 67.1%of the study sample use fan for cooling, 5.8 % used conditioner & 26.5 % used windows**.**
- 11.3%of the study sample have cats in their home, 1.6 % have dog, 9 % have birds, 10.8 % have chickens, 5.2% have goats, 12.8% have pigeons, 2.3% have other kinds of animals &around 45.1% have no animals at home**.**
- 22.4%of the study sample have cats around the house, 5.8 % have dog, 4.1 % have horses, 12.6 % have chickens, 22.8% have goats and cows, 2.5 % have other kinds of animals & 16.5%have no animal around their houses.
- 38.2%of the study sample use cotton pillow, 27.4 % use spring, 48 % use feather, 24.3 % use wool, & 4.2 % use other types of pillows.
- 5.6%of the study sample had family member of three and less**,** and the majority (69.4%) had a large family of 7and more members.
- 4.8%of the study sample have2 and less rooms, 24.8 %have 3 rooms, 31.3 % have 4 rooms, 20.4 % have 5 rooms & 18 % having 6 rooms.
- 75.1% of the study sample use carpets for covering the floor, 14.1% of the study sample use moquette, and 10.1% of the study sample use nothing to cover their floor.

3.1.4 Health Profile

3.1.4.1. Triggers of asthma and allergy (only those who have asthma and allergy symptoms answered these questions)

Table (9) Triggers that worsen or cause symptoms of the study sample.

Triggers	Types Of Allergy	Frequency	Percent %
Grass, trees	Rhinitis	209	20.9
	Asthma	17	1.7
	Skin allergy	60	6.0
House dust	Rhinitis	467	46.7
	Asthma	69	6.9
	Skin allergy	17	1.7
Animals	Rhinitis	95	9.5
	Asthma	34	3.4
	Skin allergy	107	10.7
Respiratory infections	Rhinitis	497	49.7
	Asthma	106	10.6
	Skin allergy	3	0.3
Exercise	Rhinitis	68	6.8
	Asthma	109	10.9
	Skin allergy	13	1.3
Night time	Rhinitis	119	11.9
	Asthma	36	3.6
	Skin allergy	32	3.2
Strong odors	Rhinitis	406	40.6
	Asthma	75	7.5
	Skin allergy	37	3.7
Cosmetics	Rhinitis	201	20.1
	Asthma	51	5.1
	Skin allergy	22	2.2
Emotional upset	Rhinitis	145	14.5
	Asthma	69	6.9
	Skin allergy	60	6.0
Smoke	Rhinitis	338	33.8
	Asthma	152	15.2
	Skin allergy	12	1.2
Tire burning , war gases	Rhinitis	491	49.1
	Asthma	117	11.7
	Skin allergy	17	1.7
Cold air	Rhinitis	148	14.8
	Asthma	63	6.3

	Skin allergy	8	0.8
Weather changes	Rhinitis	342	34.2
	Asthma	123	12.3
	Skin allergy	35	3.5
Drugs	Rhinitis	99	9.9
	Asthma	25	2.5
	Skin allergy	61	6.1
Foods, food additives	Rhinitis	39	3.9
	Asthma	27	2.7
	Skin allergy	83	8.3
Latex	Rhinitis	40	4.0
	Asthma	14	1.4
	Skin allergy	158	15.8
Menstrual cycle, pregnancy	Rhinitis	11	1.1
	Asthma	6	0.6
	Skin allergy	46	4.6
Morning time	Rhinitis	116	11.6
	Asthma	40	4.0
	Skin allergy	7	0.7
Auto exhaust	Rhinitis	339	33.9
	Asthma	122	12.2
	Skin allergy	16	1.6
Insect. Mold	Rhinitis	183	18.3
	Asthma	39	3.9
	Skin allergy	172	17.2

these percentages of triggers for those who have symptoms of the total study sample, the rest of percentage don't have symptoms.

Table 9shows results for the triggers that worsen or cause symptoms of population samples as follows:

- The triggers that have large effect on health of population sample for rhinitis were respiratory infections (49.7%), tire burning and war gases 49.1%, house dust 46.7%, strong odors 40.6%, auto exhaust 33.9%, smoke 33.8%, weather changes 34.2%, grass and trees 20.9%, and cosmetics 20.1%. Other triggers that have lesser effect on Rhinitis are: insect and mold 18.3%, cold air 14.8%, emotional upset 14.5%, night times 11.9 %, morning time 11.6%, drugs9.9%, animals 9.5%, exercise 6.8%, latex 4% foods 3.9%, menstrual cycle and pregnancy 1.1%.

- The triggers that have large effect on health of population sample for asthma were smoke 15.2 %, weather changes 12.3%, auto exhaust 12.2%, tire burning and war gases 11.7%, exercise 10.9%, respiratory infection 10.6 %. Triggers with less effect on asthma were: strong odors 7.5 %, house dust 6.9%, emotional upset 6.9 %, cold air 6.3 %, cosmetics 5.1%, morning time 4%, insect and mold 3.9%, night time 3.6 %, animals 3.4%, foods and food additives 2.7%, drugs 2.5%, grass and trees 1.7 %, latex 1.4%, menstrual cycle and pregnancy 0.6 %.

- The triggers that have large effect on health of population sample for skin allergy were insect and mold (17.2%), latex 15.8%, animals 10.7%, foods and food additives 8.3%, drugs 6.1%, emotional upset 6.0 %, menstrual cycle and pregnancy 4.6%, strong odors 3.7 %, weather changes 3.5%, night time 3.2 %, cosmetics 2.2%, triggers with less effect were: house dust, tire burning and war gases 1.7%, exercise 1.3%, auto exhaust 1.6%, smoke 1.2 %, cold air

0.8 %, morning time 0.7%, grass and trees 0.6%, respiratory infection 0.3 %.

Percentage of asthma and allergy

Table (10) Percentage of Asthma, wheezing, rhinitis, skin allergy, latex allergy, food allergy, drug allergy, insect sting allergy.

Types of Allergy	Frequency	Percent %
Asthma	41	4.1
Ever wheezing	58	5.8
Allergic Rhinitis	381	38.1
Skin allergy	316	31.6
Latex rubber allergy	33	3.3
Food allergy	110	11.0
Drug allergy	84	8.4
Insect sting allergy	311	31.1

- 4.1% of study sample stated that they have asthma, 5.8 % had ever wheezing, 38.1% had allergic rhinitis, 31.6% had skin allergy, 3.3% had latex rubber allergy, 11.0% had food allergy, 8.4 % had drug allergy and 31.1 % had insect sting allergy.

3.1.4.3. Prevalence rate of asthma and allergy

Prevalence rate of asthma and allergy types were calculated as follows (R.beaglehole):

$$\mathbf{P} = \frac{\text{Number of people with the disease or condition at a specific time}}{\text{Number of people in the population at risk at the specified time}} (\times 10)^{n}$$

The number of An–Najah University students in the year 2004 was 12500 students (Mr. Rafi daraghmeh).

Table (11) Prevalence rate for asthma and allergy

Types of Allergy	Frequency	Prevalence rate
Asthma	41	0.33
Ever wheezing	58	0.46
Allergic Rhinitis	381	3.1
Skin allergy	316	2.5
Latex rubber allergy	33	0.26
Food allergy	110	0.88
Drug allergy	84	0.67
Insect sting allergy	311	2.5

- Prevalence rate for asthma and allergy among An–Najah University students were 0.33 % for asthma , 0.46% for ever wheezing , 3.1% for allergic rhinitis, 2.5 % Skin allergy, 0.26 % for latex rubber allergy, 0.88 % food allergy, 0.67 % drug allergy and 2.5% insect sting allergy.

Table (12) Distribution of allergic diseases according to the study sample gender

Total	**Asthma**			
	No	Yes	Gender	
448	421	27	Count	Male
100.0%	94.0%	6.0%	%	
510	498	12	Count	Female
100.0%	97.6%	2.4%	%	
958	919	39	Count	Total
100.0%	95.9%	4.1%	%	
Total	**Allergic Rhinitis**			
	No	Yes	Gender	
448	272	176	Count	Male
100.0%	60.7%	39.3%	%	
511	319	192	Count	Female
100.0%	62.4%	37.6%	%	
959	591	368	Count	Total
100.0%	61.6%	38.4%	%	
Total	**Skin Allergy**			
	No	Yes	Gender	
448	288	160	Count	Male
100.0%	64.3%	35.7%	%	
510	370	140	Count	Female
100.0%	72.5%	27.5%	%	
958	658	300	Count	Total
100.0%	68.7%	31.3%	%	

Table 12 shows the distribution of allergic diseases among both sexes for the study sample, the results indicate male predominance for those who have asthma; 6 % for male & 2.4% for female, similar results were seen for those who have skin allergy; with the percentage of 35.7%, 27.5% respectively. The results show slightly higher shift for the males among those who have allergic rhinitis.

Table (13) Distribution of allergic diseases according to the study sample Residence

Asthma				**Total**
Residence		Yes	No	
Camp	Count	0	38	38
	%	0%	100.0%	100.0%
Village	Count	27	522	549
	%	4.9%	95.1%	100.0%
City	Count	14	396	410
	%	3.4%	96.6%	100.0%
Total	Count	41	956	997
	%	4.1%	95.9%	100.0%
Allergic Rhinitis				**Total**
Residence		Yes	No	
Camp	Count	17	21	38
	%	44.7%	55.3%	100.0%
Village	Count	215	335	550
	%	39.1%	60.9%	100.0%
City	Count	149	261	410
	%	36.3%	63.7%	100.0%
Total	Count	381	617	998
	%	38.2%	61.8%	100.0%
Skin Allergy				**Total**
Residence		Yes	No	
Camp	Count	23	15	38
	%	60.5%	39.5%	100.0%
Village	Count	200	349	549
	%	36.4%	63.6%	100.0%
City	Count	92	318	410
	%	22.4%	77.6%	100.0%
Total	Count	315	682	997
	%	31.6%	68.4%	100.0%

Table 13 shows the distribution of allergic diseases for the study sample according to their residence. The results show that: 4.9% of village residents and 3.4% of city residents had asthma; however, there were not any cases from the refugee camps.

- Regarding allergic rhinitis, 44.7% of camp residents claimed that they have AR, 39.1% of village residents and 36.3% of city residents had AR.
- The highest percentage of skin allergy was among camp residents. About 60 % of camp residents, 36.4 % of village residents, and 22.4% of city residents of the study sample claimed that they have skin allergy.

3.2. Peak Expiratory Flow Result

Peak expiratory flow measurement were taken for study samples then prediction percent was calculated by using equations based on European or USA populations (Nunn and Gregg) and equations for normative lung function values for the Persian population (Golshan et al, 2003).

3.2.1. Comparison between Persian percent prediction, Nunn, and Gregg percent prediction equations.

Table (14) Male group comparison between Persian percent prediction, Nunn, and Gregg percent prediction equations.

Parameter	Types of prediction equation	Percent Prediction categories	Frequency	Percent%
Male<21	**Persian**	PP < 50	3	1.3
		PP (50 -79.9)	27	11.6
		PP ≥ 80	185	79.4
		Total	215	92.3
		Missing System	18	7.7
		Total	**233**	**100.0**
Male<21	**(Nunn And Gregg)**	PP < 50	65	27.9
		PP (50 -79.9)	102	43.8
		PP ≥ 80	48	20.6
		Total	215	92.3
		Missing System	18	7.7
		Total	**233**	**100.0**
Male≥21	**Persian**	PP < 50	0	0
		PP (50 -79.9)	0	0
		PP ≥ 80	183	88.0
		Total	183	88.0
		Missing System	25	12.0
		Total	**208**	**100**
Male≥21	**(Nunn And Gregg)**	PP < 50	51	24.5
		PP (50 -79.9)	81	38.9
		PP ≥ 80	51	24.5
		Total	183	88.0
		Missing System	25	12.0
		Total	**208**	**100.0**

* Correlation is significant at p value = 0.01*

PP < 50 (danger), PP 50 -79.9 (caution), PP ≥ 80 (normal lung function)

- Persian percent predictions of PEF for males who are less than 21 years old were: 1.3% less

than 50 (danger), 11.6 % between 50 -79.9 (caution), 79.4 % were ≥ 80 (normal lung function).

- While 88.0%, of male, who are more or equal to 21years old were normal and there were no danger or caution cases, when Persian equation was applied.
- Nunn and Gregg percent prediction of PEF for males who are less than 21 years old were 27.9% less than 50 (danger), 43.8 % between 50 -79.9 (caution), 20.6 % were ≥ 80 (normal lung function).
- Nunn and Gregg percent prediction of PEF for males who are more or equal to 21 years old were 24.5 % less than 50 (danger), 38.9 % between 50 -79.9 (caution), 24.5 % were ≥ 80 (normal lung function).

Table (15) Female group comparison between Persian percent prediction, Nunn, and Gregg percent prediction equations.

Parameter	Types of Prediction Equations	Percent Prediction Categories	Frequency	Percent%
Female < 21	**Persian**	PP < 50	1	0.3
		PP (50 -79.9)	46	15.2
		PP ≥ 80	217	71.6
		Total	264	87.1
		Missing system	39	12.9
		Total	**303**	**100.0**
Female < 21	**(Nunn And Gregg)**	PP < 50	78	25.7
		PP (50 -79.9)	168	55.4
		PP ≥ 80	18	5.9
		Total	264	87.1
		Missing system	39	12.9
		Total	**303**	**100.0**
Female ≥21	**Persian**	PP < 50	22	11.1
		PP (50 -79.9)	123	61.8
		PP ≥ 80	31	15.6
		Total	176	88.4
		Missing system	23	11.6
		Total	**199**	**100.0**
Female ≥21	**(Nunn And Gregg)**	PP < 50	46	23.1
		PP (50 -79.9)	118	59.3
		PP ≥ 80	12	6.0
		Total	176	88.4
		Missing system	23	11.6
		Total	**199**	**100.0**

* Correlation is significant at p value = 0.01

PP < 50 (danger), PP 50 -79.9 (caution), PP ≥ 80 (normal lung function)

- Persian percent predictions of PEF for females who are less than 21years old were: 0.3% less than 50 (danger), 15.2%between 50 -79.9 (caution), 71.6% were ≥ 80 (normal lung function).
- While 15.6% of females who are more or equal to 21 years old were normal and 61.8% between 50 -79.9 (caution), 11.1% less than 50 (danger).
- Nunn and Gregg percent prediction of PEF for females who are less than 21 years old were: 25.7 % less than 50 (danger), 55.4% between 50 -79.9 (caution), 5.9 % were ≥ 80 (normal lung function).
- Nunn and Gregg percent prediction of PEF for females who are more or equal to 21 years

old were 23.1 % less than 50 (danger), 59.3% between 50 -79.9 (caution), 6.0 % were ≥ 80 (normal lung function).

- Note: missing value was relatively high in Q 9 & Q10 because nearly 100 subjects didn't record their height which considered as important variables for prediction equations of PEF.

3.3. Relationships Results

To study the relationship between asthma, allergy and other variables such as (Gender, smoking, smoking at home, Living place, the tree and grass around the house, Kind of building that I live in, Kind of heating source, Kind of cooling source, Kind of animals in house, Kind of animal around the house, Kind of pillow used, # of family in my house, # of rooms in my house, sports Practice, Heart problems ,Diabetes, Weight loss, Deep sleeping, Chronic respiratory infections, Chronic abdominal pain, Nasal polyps, Anxiety, Thyroid disorder, Skin disorder, Sleep apnea, Chronic diarrhea, Migraines, Anemia and Glaucoma),we computed the Chi square between them , the results were as shown in the tables below.

3.3.1. Allergic Rhinitis & social, environmental, health profile

Table (16) Allergic rhinitis& social, environmental, health profile relationships

Variables Name	Chi Value	P Value
Gender	0.296	0.587
Are you smoker	0.225	0.635
Are their smoker in your house	1.06	0.303
Living place	1.473	0.47
The tree and grass around the house	0.957	0.81
Kind of building that I live in it	3.4	0.18
Kind of heating source	5.97	0.42
Kind of cooling source	1.74	0.41
Kind of animals in house	6.75	0.455
Kind of animal around the house	5.07	0.53
Kind of pillow I use	4.97	0.29
# of family in my house	24.9	0.07
# of rooms in my house	9.58	0.65
Sports practice	4.65	0.3
Heart problems	0.17	0.67
Diabetes	0.022	0.881

Weight loss	7.2	0.007
Deep sleeping	10.4	0.001
Chronic respiratory infections	27.9	0.000
Chronic abdominal pain	7.6	0.006
Nasal polyps	25.7	0.000
Anxiety	10.37	0.001
Thyroid disorder	0.01	0.9
Skin disorder	1.37	0.24
Sleep apnea	5.1	0.023
Chronic diarrhea	8.5	0.004
Migraines	8.09	0.000
Anemia	5.47	0.019
Glaucoma	0.663	0.41

- Their was statistically significant relationship (p value < 0.05) of allergic rhinitis and weight loss, deep sleeping, chronic respiratory infections, chronic abdominal pain, nasal polyps, anxiety, sleep apnea, chronic diarrhea, migraines, anemia .
- Their was no statistically significant relationship (p value > 0.05) between allergic rhinitis and gender, smoking, smoker at home, living place, the tree and grass around the house, kind of building that I live in, kind of heating source, kind of cooling source, kind of animals in house, kind of animal around the house, kind of pillow I use, # of family in my house, # of rooms in my house, practice a sports, heart problems, diabetes, thyroid disorder, skin allergy, glaucoma.

3.3.2. Asthma& social, environmental, health profile

Table (17) Asthma & social, environmental, health profile relationships

Variables Name	Chi Value	P Value
Gender	8.2	0.004
Are you smoker	5.6	0.018
Are their smoker in your house	1.31	0.252
Living place	3.04	0.219
The tree and grace around the house	4	0.259
Kind of building that I live in it	0.19	0.90
Kind of heating source	3.85	0.69
Kind of cooling source	2.55	0.27
Kind of animals in house	6.57	0.47
Kind of animal around the house	2.7	0.83
Kind of bellow I use	0.783	0.94
# of family in house	23.18	0.10
# of rooms in house	2.3	0.99
Practice a sports	0.18	0.66
Heart problems	8.47	0.004
Diabetes	0.13	0.71
Weight losing	0.02	0.86
Deep sleeping	1.3	0.24
Chronic respiratory infections	16.6	0
Chronic abdominal pain	0.14	0.707
Nasal polyps	35	0.06

Anxiety	0.99	0.31
Thyroid disorder	6.27	0.01
Skin disorder	0.003	0.957
Sleep apnea	0.13	0.71
Angina	18.56	0
Chronic diarrhea	5.6	0.017
Migraines	1.66	0.19
Anemia	0.05	0.81
Glaucoma	6.28	0.012

- Their was statistically significant relationship (p value < 0.05) of asthma and gender, smoking, heart problems, chronic respiratory infections, osteoporosis, thyroid disorder, angina, chronic diarrhea, glaucoma.
- Their was no statistically significant relationship (p value > 0.05) of asthma & smoker in house, living place, the tree and grass around the house, kind of building that I live in, kind of heating source, kind of cooling source, kind of animals in house, kind of animal around the house, kind of pillow I use, # of family in my house, # of rooms in my house, practice a sports, allergy test, diabetes, weight loss, deep sleeping , chronic abdominal pain, nasal polyps, anxiety, skin allergy, sleep apnea, migraines, anemia.

3.3.3. Skin allergy& social, environmental, health profile

Table (18) Skin allergy & social, environmental and health profile relationships

Variable Name	Chi Value	P Value
Gender	4.68	0.03
Are you smoker	0.232	0.63
Are there smoker in your house	1.17	0.278
Living place	18.7	0
The tree and grass around the house	1.98	0.57
Kind of building that I live in it	5.1	0.07
Kind of heating source	6.7	0.34
Kind of cooling source	0.35	0.838
Kind of animals in house	9.93	0.192
Kind of animal around the house	6.4	0.37
Kind of pillow I use	6.5	0.164
# Of family in house	37.9	0.002
# Of rooms in house	3.2	0.993
Practice a sport	2.9	0.086
Allergy test	12.9	0
Heart problems	9.57	0.002
Diabetes	0.82	0.36
Weight losing	3.9	.04
Deep sleeping	10.45	0.001
Chronic respiratory infections	3.8	0.05
Chronic abdominal pain	11.13	0.001
Nasal polyps	4	0.045
Anxiety	20.4	0
Thyroid disorder	8.8	0.003

Skin disorder	124.4	0
Sleep apnea	7.9	0.005
Angina	10.8	0.001
Chronic diarrhea	9.7	0.002
Migraines	24.8	0
Anemia	0.67	0.41
Glaucoma	4.8	0.028

- Their was statistically significant relationship (p value < 0.05) of skin allergy and gender, living place, # of family in house, allergy test, heart problems, deep sleeping , chronic abdominal pain, nasal polyps, anxiety, osteoporosis, thyroid disorder, skin allergy, sleep apnea, chronic diarrhea, migraines, glaucoma, ulcer kidney stone and Chronic respiratory infections
- Their was no statistically significant relationship (p value > 0.05) skin allergy and smoking, smoker in house, the tree and grass around the house, kind of building that I live in it, kind of heating source, kind of cooling source, kind of animals in house, kind of animal around the house, kind of pillow I use, # of rooms in house, practice a sport, diabetes and anemia.

3.3.4. BMI categorized & Persian percent prediction for male categorized

To test the relation between both variables Pearson chi – square was computed, the results were shown in the tables below.

Table (19) BMI categorized & Persian percent prediction for male less than 21 categorized

BMI Categorized	Persian Percent Prediction For Male Less Than 21 Categorized			
	Less than 50 (Dangerous)	(50-79.9) (Caution)	80 and more (Normal)	**Total**
Normal (< 25) % within BMI categorized	5 1.6%	49 15.3%	266 83.1%	320 100.0%
Overweight (25-29.9) Count % within BMI categorized	0 0	4 5.5%	69 94.5%	73 100.0%
Obese (30 & over) Count % within BMI categorized	0 0	1 7.1%	13 92.9%	14 100.0%
Total Count **% within BMI categorized**	5 1.6%	53 13.3%	348 85.5%	407 100.0%

Pearson chi – square = 7.095, p value = 0.131

Bars as shown below demonstrated this table

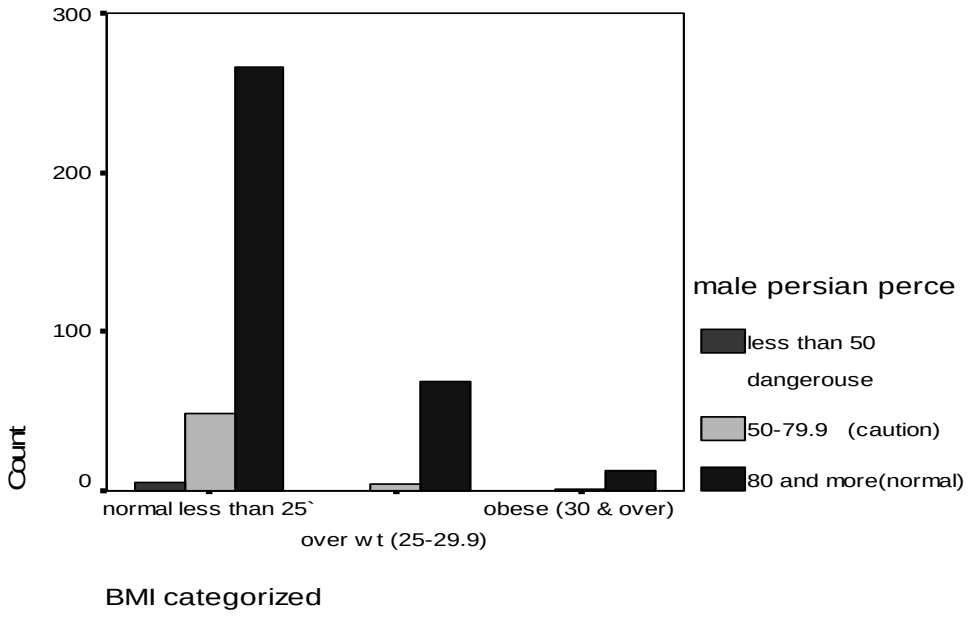


Figure 1. BMI & Persian percent prediction for male less than 21

Table (20) BMI categorized & Persian percent prediction for male equal or more than 21 categorized

BMI Categorized	Persian Percent Prediction For Male Equal Or More Than 21 Categorized			
	Less Than 50 (Dangerous)	(50-79.9) (Caution)	80 and More (Normal)	**Total**
Normal < 25 % Within BMI Categorized	1 0.3%	1 0.3%	318 99.4%	320 100.0%
Overweight (25-29.9) Count % Within BMI Categorized	0 0	0 0	73 100.0%	73 100.0%
Obese (30 & Over) Count % Within BMI Categorized	0 0	0 0	14 100.0**%**	14 100.0%
Total Count **%Within BMI Categorized**	1 0.2%	1 0.2%	405 99.5%	407 100.0%

Pearson chi – square = 0.546, p value = 0.969

Bars as shown below demonstrated this table

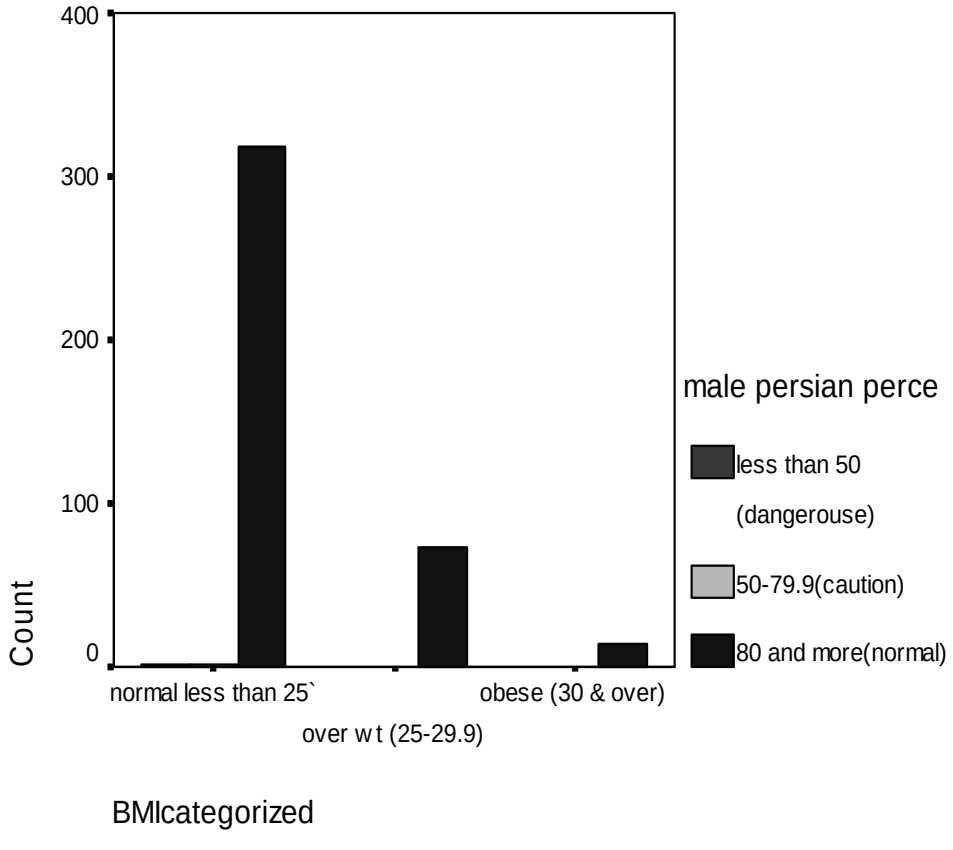


Figure 2. BMI & Persian percent prediction for male equal or more than 21

3.3.5. Sport practicing & Persian percent prediction for male categorized

To test the relation between both variables Pearson chi–square was computed, the results were shown in the tables below.

Table (21) Sport practicing & Persian percent prediction for male less than 21 categorized

Sport Practicing		Persian percent prediction for male less than 21 categorized			Total
		Less than 50 (Dangerous)	(50 -79.9) (Caution)	80 and more (Normal)	
Yes	**Count**	3	35	231	269
	%	1.1%	13.0%	85.9%	100.0%
No	**Count**	1	16	111	128
	%	0.8%	12.5%	86.7%	100.0%
Total	**Count**	4	51	342	397
	%	1.0%	12.8%	86.1%	100.0%

Pearson chi – square = 0.121, p value = 0 .941

Bars as shown below demonstrated this table

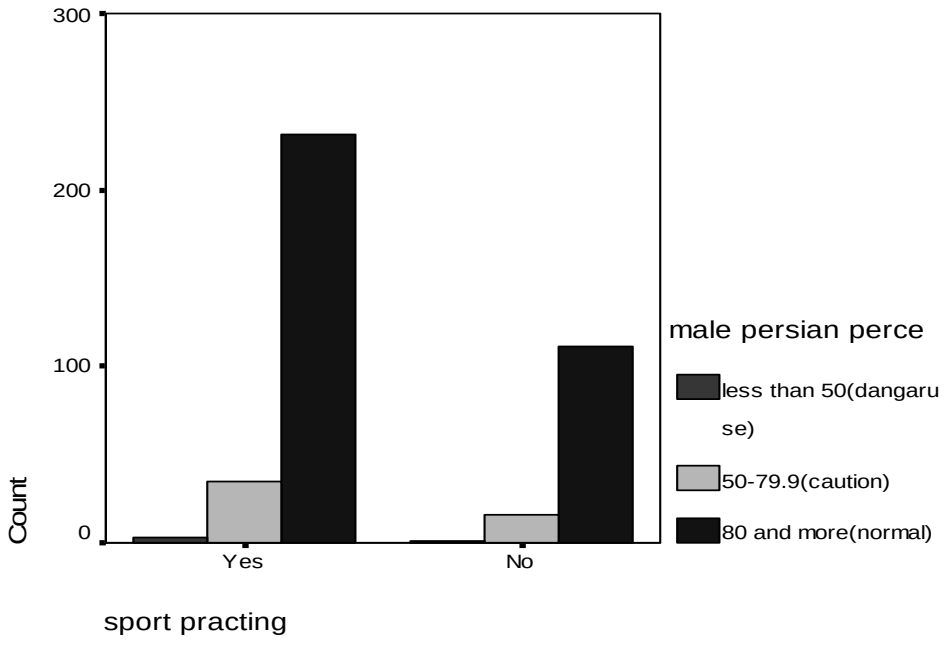


Figure 3. Sport practicing & Persian percent prediction for male less than21

Table (22) Sport practicing & Persian percent prediction for male equal or more than 21 categorized

Sport Practicing		Persian percent prediction for male equal or more than 21 categorized		Total
		Less than 50 (Dangerous)	80 and more (Normal)	
Yes	**Count**	1	268	269
	%	0.4%	99.6%	100.0%
No	**Count**	0	128	128
	%	0	100.0%	100.0%
Total	**Count**	1	396	397
	%	o.3%	99.7%	100.0%

Pearson chi – square = 0.472, p value = 0 .49

Bars as shown below demonstrated this table

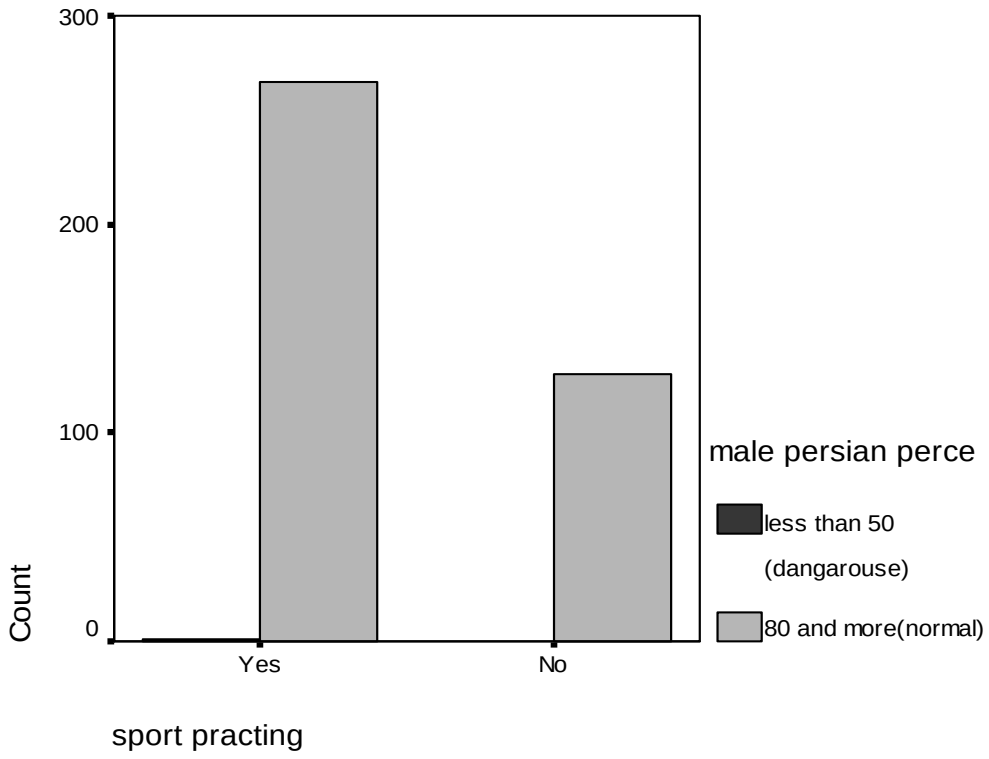


Figure 4. Sport practicing & Persian percent prediction for male equal or more than 21

3.3.6. Smoking & Persian percent prediction for male categorized

To test the relation between both variables Pearson chi – square was computed, the results were shown in the tables below.

Table (23) Smoking & Persian percent prediction for male less than 21 categorized

Smoking		Persian percent prediction for male less than 21 categorized			Total
		less than 50 (Dangerous)	(50 - 79.9) (Caution)	80 and more (Normal)	
Yes	**Count**	0	22	117	139
	%	0	15.8%	84.2%	100.0%
No	**Count**	5	33	238	276
	%	1.8%	12.0%	86.2%	100.0%
Total	**Count**	5	55	355	415
	%	1.2%	13.3%	85.5%	100.0%

Pearson chi – square = 3.609, p value = 0.165

Bars as shown below demonstrated this table

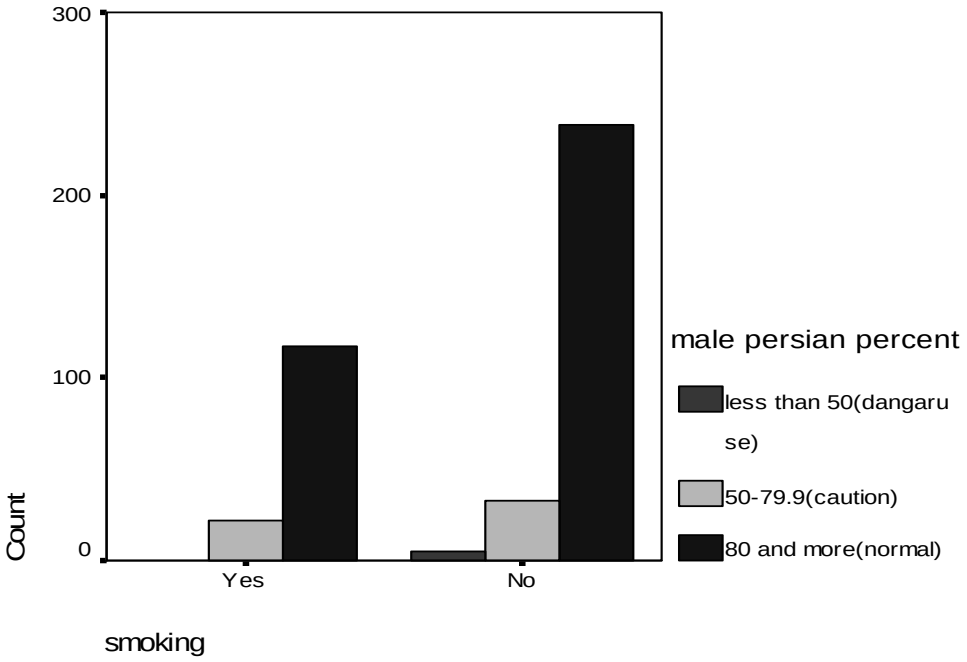


Figure 5. Smoking & Persian percent prediction for male less than 21

Table (24) Smoking & Persian percent prediction for male equal or more than 21 categorized

Smoking		Persian percent prediction for male equal or more than 21 categorized			Total
		less than 50 (Dangerous)	(50-79.9) (Caution)	80and more (Normal)	
Yes	**Count**	0	0	139	139
	%	0	0	100.0%	100.0%
No	**Count**	1	1	274	276
	%	0.4%	0.4%	99.3%	100.0%
Total	**Count**	1	1	413	415
	%	0.2%	0.2%	99.5%	100.0%

Pearson chi – square = 1.012, p value = 0 .603

Bars as shown below demonstrated this table

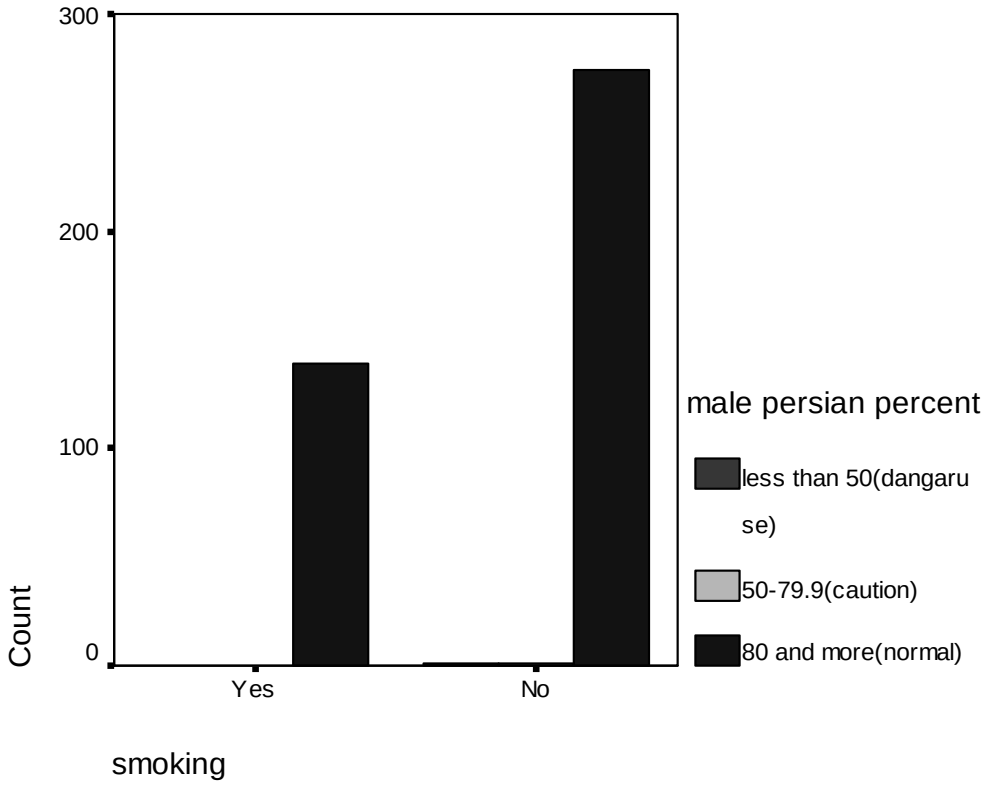


Figure 6. Smoking & Persian percent prediction for male equal or more than 21

3.3.7. Residence & Persian percent prediction for male categorized

To test the relation between both variables Pearson chi – square was computed, the results were shown in the tables.

Table (25) Residence & Persian percent prediction for male less than 21 categorized

Residence		Persian percent prediction for male less than 21 categorized			Total
		Less than 50 (Dangerous)	(50 - 79.9) (Caution)	80 and more (Normal)	
Camp	Count %	0 0	5 31.3%	11 68.8%	16 100.0%
Village	Count %	5 1.8%	34 12.5%	233 85.7%	272 100.0%
City	Count %	0 0	15 11.3%	118 88.7%	133 100.0%
Total	**Count** **%**	5 1.2%	54 12.8%	362 86.0%	421 100.0%

Pearson chi – square = 7.916, p value = 0.095

Bars as shown below demonstrated this table

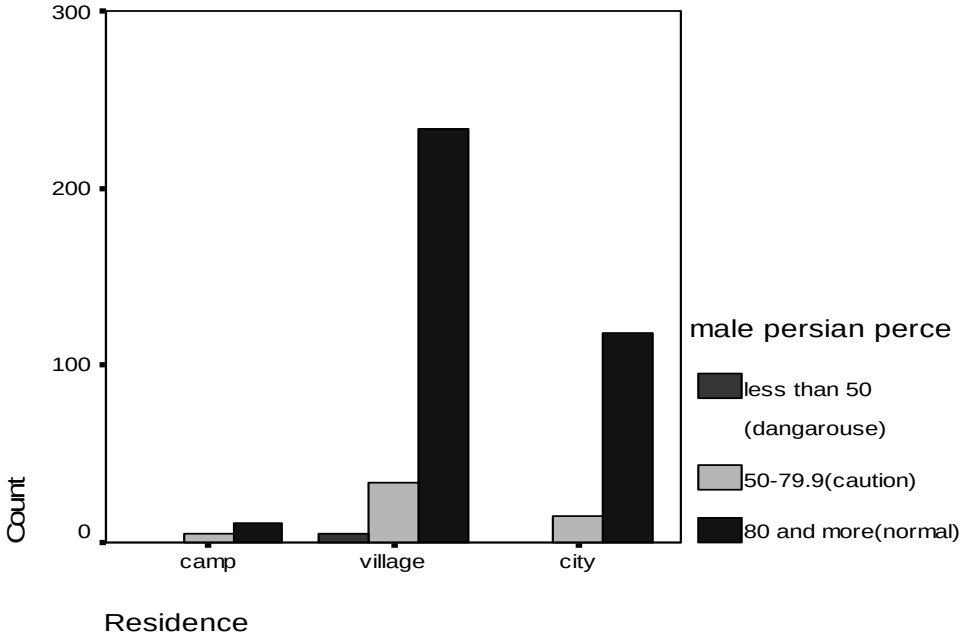


Figure 7. Residence & Persian percent prediction for male less than 21

Table (26) Residence & Persian percent prediction for male equal or more than 21 categorized

Residence		Persian percent prediction for male equal or more than 21 categorized			Total
		Less than 50 (Dangerous)	(50-79.9) (Caution)	80 and more (Normal)	
Camp	**Count**	0	0	16	16
	%	0	0	100.0%	100.0%
Village	**Count**	1	1	270	272
	%	0.4%	0.4%	99.3%	100.0%
City	**Count**	0	0	133	133
	%	0	0	100.0%	100.0%
Total	**Count**	1	1	419	421
	%	0.2%	0.2%	99.5%	100.0%

Pearson chi – square = 1.101, p value = 0.894

Bars as shown below demonstrated this table

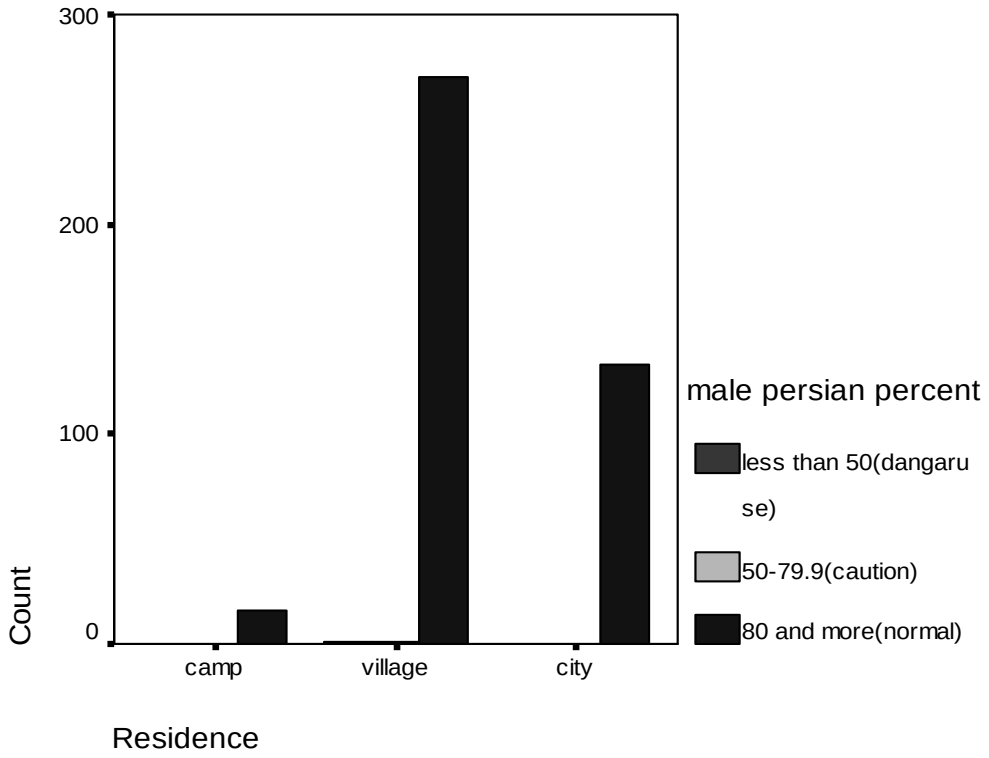


Figure 8. Residence & Persian percent prediction for male equal and more than 21

3.3.8. Asthma & Persian percent prediction for male categorized

To test the relation between both variables Pearson chi – square was computed , the results were shown in the tables below.

Table (27) Asthma & Persian percent prediction for male less than 21 categorized

Asthma		Persian percent prediction for male less than 21 categorized			Total
		Less than 50 (Dangerous)	(50 - 79.9) (Caution)	80 and more (Normal)	
Yes	**Count**	0	4	21	25
	%	0	16.0%	84.0%	100.0%
No	**Count**	5	51	341	397
	%	1.3%	12.8%	85.9%	100.0%
Total	**Count**	5	55	362	422
	%	1.2%	13.0%	85.8%	100.0%

Pearson chi – square = 0.504, p value = 0.777

Bars as shown below demonstrated this table

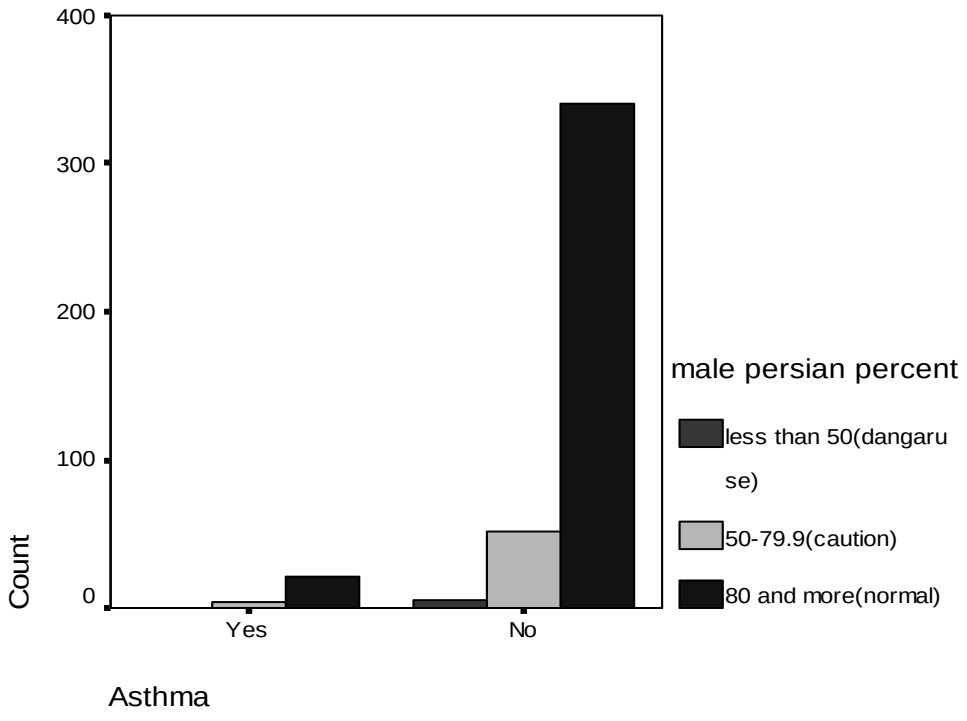


Figure 9. Asthma & Persian percent prediction for male less than 21

Table (28) Asthma & Persian percent prediction for male equal or more than 21 categorized

Asthma		Persian percent prediction for male equal or more than 21 categorized			Total
		Less than 50 (Dangerous)	(50-79.9) (Caution)	80and more (Normal)	
Yes	**Count**	0	0	25	25
	%	0	0	100.0%	100.0%
No	**Count**	1	1	395	397
	%	0.3%	0.3%	99.5%	100.0%
Total	**Count**	1	1	420	422
	%	0.2%	0.2%	99.5%	100.0%

Pearson chi – square = 0.127, p value = 0.939

Bars as shown below demonstrated this table

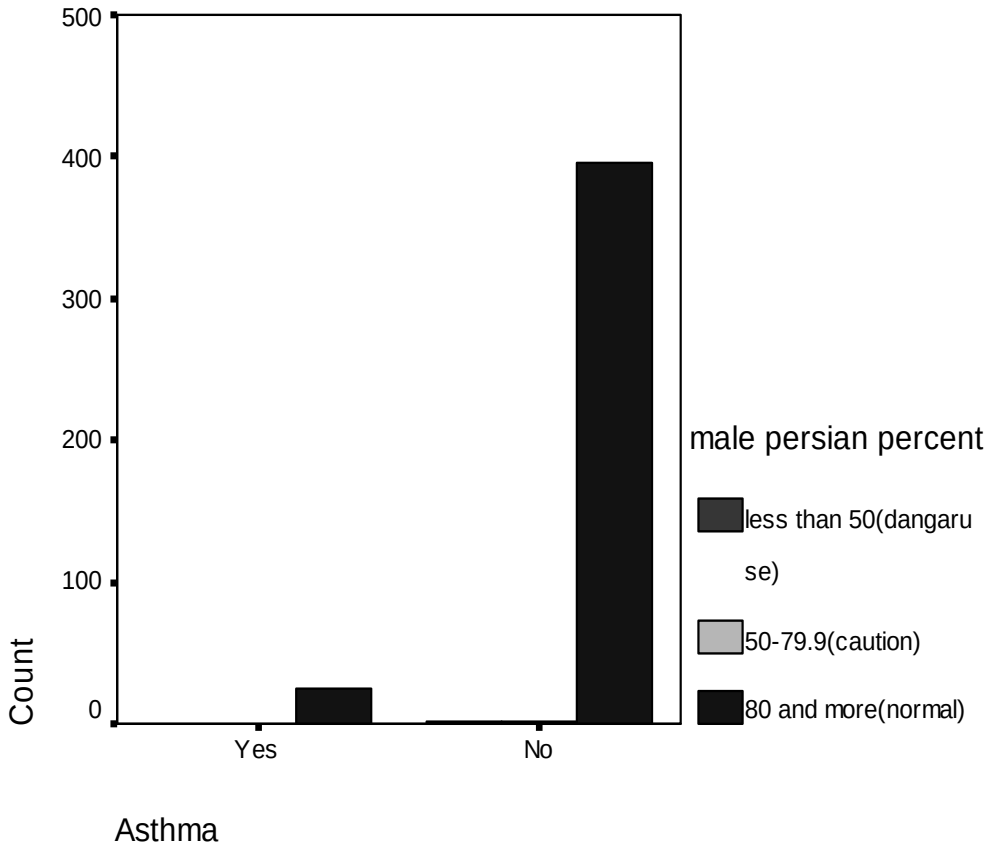


Figure 10. Asthma & Persian percent prediction for male equal or more than 21

3.3.8. BMI & Persian percent prediction for female categorized

To test the relation between both variables Pearson chi–square was computed, the results were shown in the tables below.

Table (29) BMI & Persian percent prediction for female less than 21 categorized

Body Mass Index		Persian percent prediction for female less than 21 categorized			Total
		Less than 50 (Dangerous)	(50-79.9) (Caution)	80 and more (Normal)	
Normal less than 25	**Count**	2	73	296	371
	%	0.5%	19.7%	79.8%	100.0%
Over weight (25 - 29.9)	**Count**	0	7	46	53
	%	0	13.2%	86.8%	100.0%
Obese (30 & over)	**Count**	0	0	5	5
	%	0	0	100.0%	100.0%
Total	**Count**	2	80	347	429
	%	0.5%	18.6%	80.9%	100.0%

Pearson chi–square = 2.807, p value = 0.591

Bars as shown below demonstrated this table

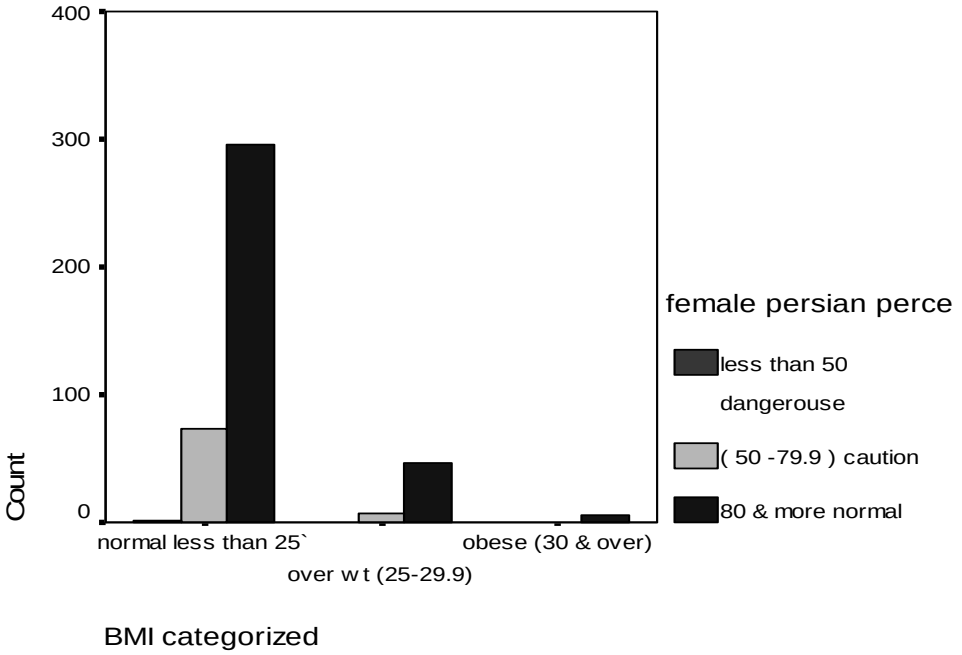


Figure 11. BMI & Persian percent prediction for female less than 21

Table (30) BMI & Persian percent prediction for female equal or more than 21 categorized

BMI categorized		Persian percent prediction for female equal or more than 21 categorized			Total
		Less than 50 (Dangerous)	(50-79.9) (Caution)	80and more (Normal)	
Normal less than 25	**Count**	62	256	53	371
	%	16.7%	69.0%	14.3%	100.0%
Over weight (25-29.9)	**Count**	5	36	12	53
	%	9.4%	67.9%	22.6%	100.0%
Obese (30 & over)	**Count**	0	3	2	5
	%	0	60.0%	40.0%	100.0%
Total	**Count**	67	295	67	429
	%	15.6%	68.8%	15.6%	100.0%

Pearson chi – square = 6.426, p value = 0.170

Bars as shown below demonstrated this table

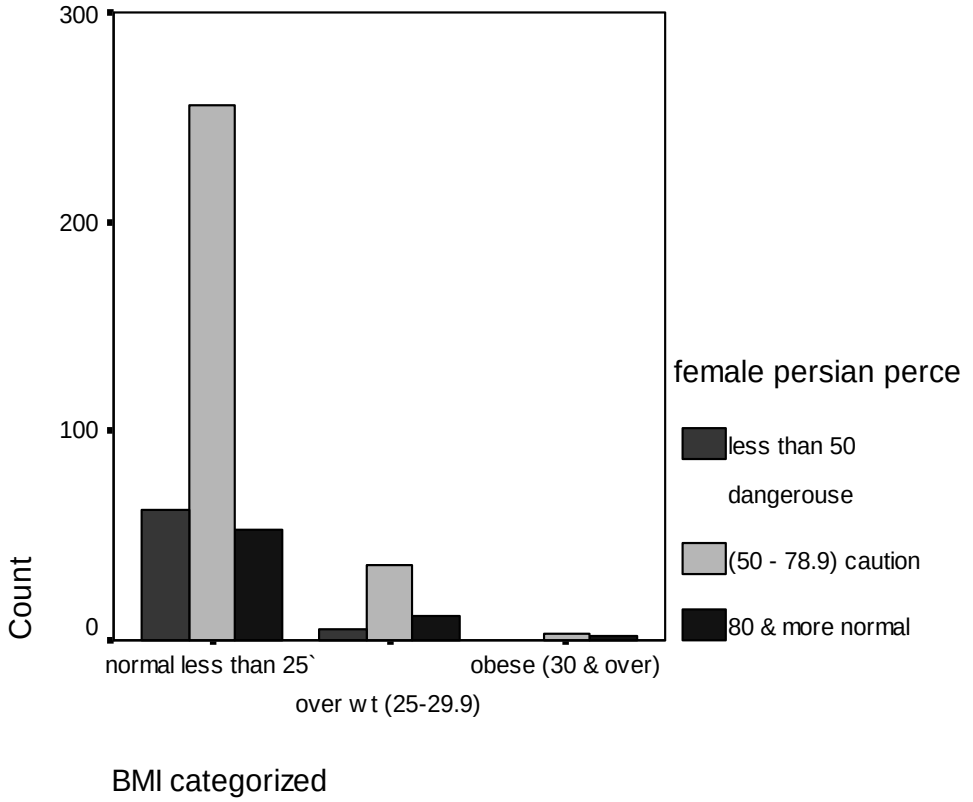


Figure 12. BMI & Persian percent prediction for female equal or more than 21

3.3.9. Sport practicing & Persian percent prediction for female categorized

To test the relation between both variables Pearson chi – square was computed, the results were shown in the tables below.

Table (31) Sports & Persian percent prediction for female less than 21categorized

Sport practicing		Persian percent prediction for female less than 21 categorized			Total
		Less than 50 (Dangerous)	(50-79.9) (Caution)	80 and more (Normal)	
Yes	**Count**	0	27	151	178
	%	0	15.2%	84.8%	100.0%
No	**Count**	2	48	190	240
	%	0.8%	20.0%	79.2%	100.0%
Total	**Count**	2	75	341	418
	%	0.5%	17.9%	81.6%	100.0%

Pearson chi – square = 3.215, p value = 0.200

Bars as shown below demonstrated this table

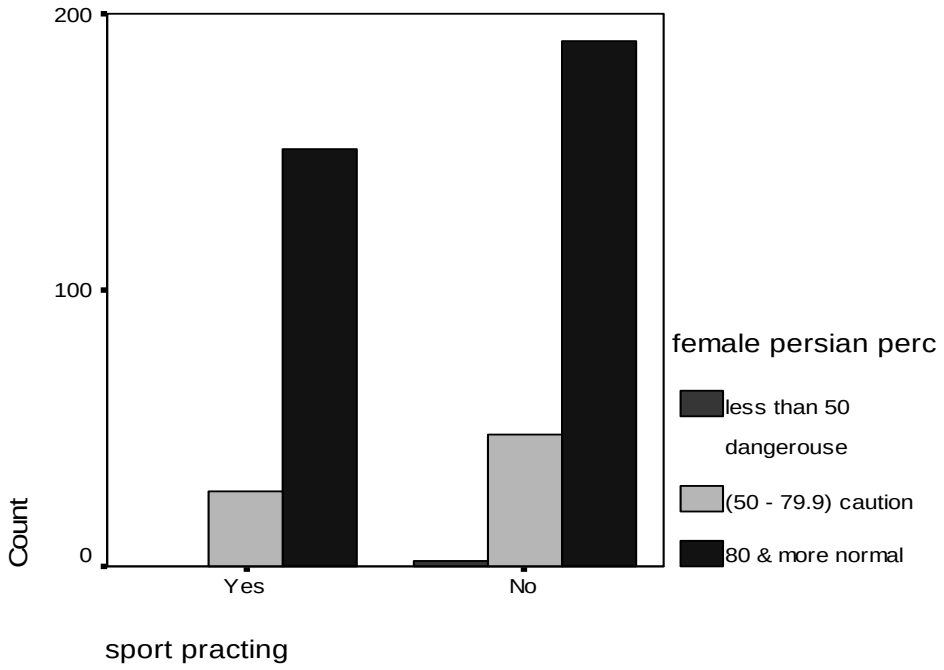


Figure 13. Sport practicing & Persian percent prediction for female less than 21

Table (32) Sports & Persian percent prediction for female equal or more than 21 categorized

Sport Practicing		Persian percent prediction for female equal or more than 21 categorized			Total
		Less than 50 (Dangerous)	(50-79.9) (Caution)	80 and more (Normal)	
Yes	**Count**	24	123	31	178
	%	13.5%	69.1%	17.4%	100.0%
No	**Count**	38	163	39	240
	%	15.8%	67.9%	16.3%	100.0%
Total	**Count**	62	286	70	418
	%	14.8%	68.4%	16.7%	100.0%

Pearson chi–square = 0.484, p value = 0.785

Bars as shown below demonstrated this table

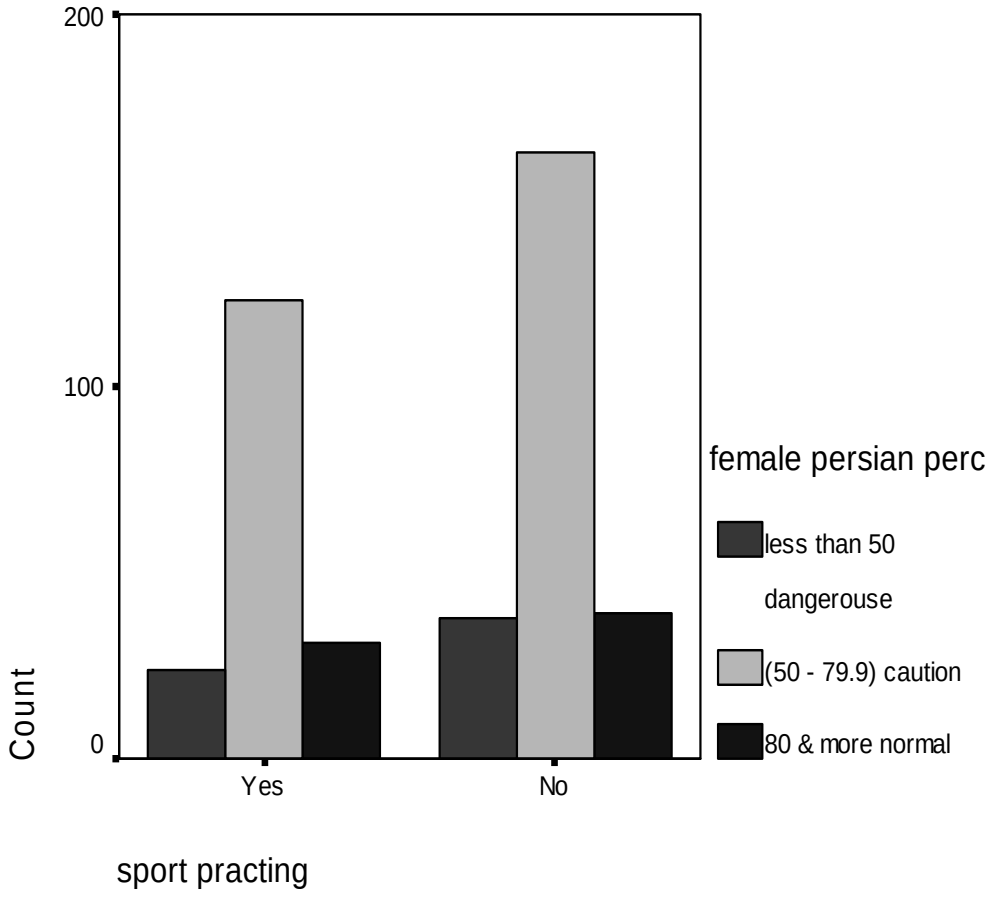


Figure 14. Sport practicing & Persian percent prediction for female equal or more than 21

3.3.10. Residence & Persian percent prediction for female categorized

To test the relation between both variables Pearson chi – square was computed, the results were shown in the tables below

Table (33) Residence & Persian percent prediction for female less than 21 categorized

Residence		Persian percent prediction for female less than 21 categorized			Total
		Less than 50 (Dangerous)	(50-79.9) (Caution)	80 and more (Normal)	
Camp	**Count**	0	2	16	18
	%	0	11.1%	88.9%	100.0%
Village	**Count**	2	38	161	201
	%	1.0%	18.9%	80.1%	100.0%
City	**Count**	0	41	180	221
	%	0	18.6%	81.4%	100.0%
Total	**Count**	2	81	357	440
	%	0.5%	18.4%	81.1%	100.0%

Pearson chi – square = 3.091, p value = 0.543

Bars as shown below demonstrated this table

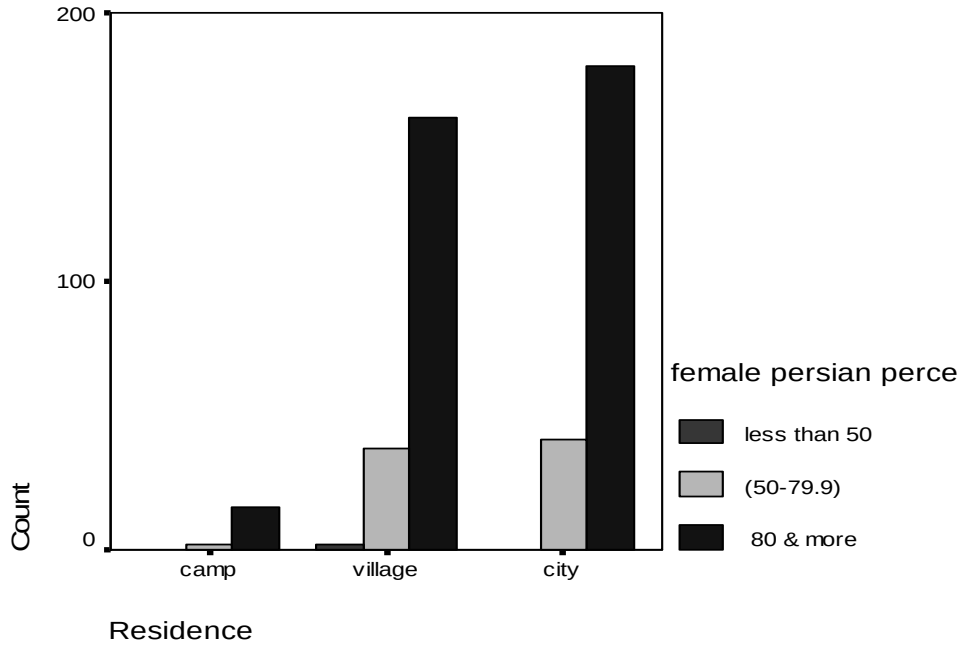


Figure 15. Residence & Persian percent prediction for female less than 21

Table (34) Residence & Persian percent prediction for female equal or more than 21 categorized

Residence		Persian percent prediction for female equal or more than 21 categorized			Total
		Less than 50 (Dangerous)	(50-79.9) (Caution)	80 and more (Normal)	
Camp	**Count**	2	12	4	18
	%	11.1%	66.7%	22.2%	100.0%
Village	**Count**	33	135	33	201
	%	16.4%	67.2%	16.4%	100.0%
City	**Count**	33	153	35	221
	%	14.9%	69.2%	15.8%	100.0%
Total	**Count**	68	300	72	440
	%	15.5%	68.2%	16.4%	100.0%

Pearson chi – square = 0.867, p value = 0.929

Bars as shown below demonstrated this table

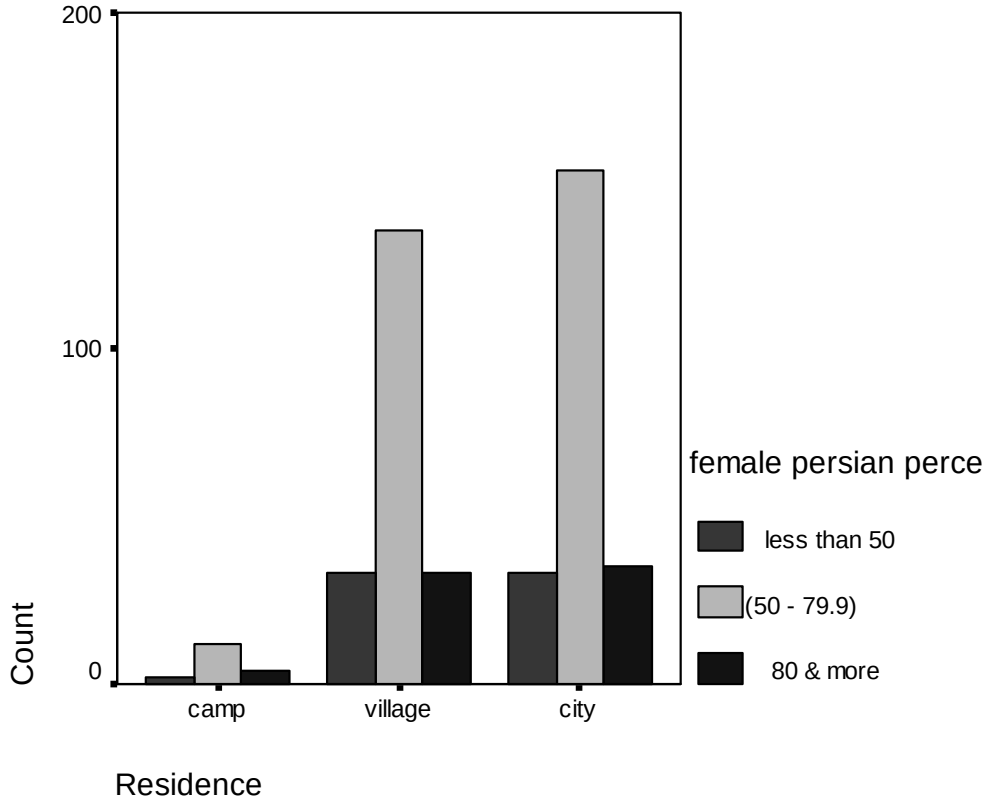


Figure 16. Residence & Persian percent prediction for female equal or more than 21

3.3.11. Smoking & Persian percent prediction for female categorized

To test the relation between both variables Pearson chi – square was computed, the results were shown in the tables below

Table (35) Smoking& Persian percent prediction for female less than 21 categorized

Smoking		Persian percent prediction for female less than 21 categorized			Total
		Less than 50 (Dangerous)	(50-79.9) (Caution)	80 and more (Normal)	
Yes	**Count**	0	3	6	9
	%	0	33.3%	66.7%	100.0%
No	**Count**	2	78	346	426
	%	0.5%	18.3%	81.2%	100.0%
Total	**Count**	2	81	352	435
	%	0.5%	18.6%	80.9%	100.0%

Pearson chi-square = 1.341, p value = 0.511

Bars as shown below demonstrated this table

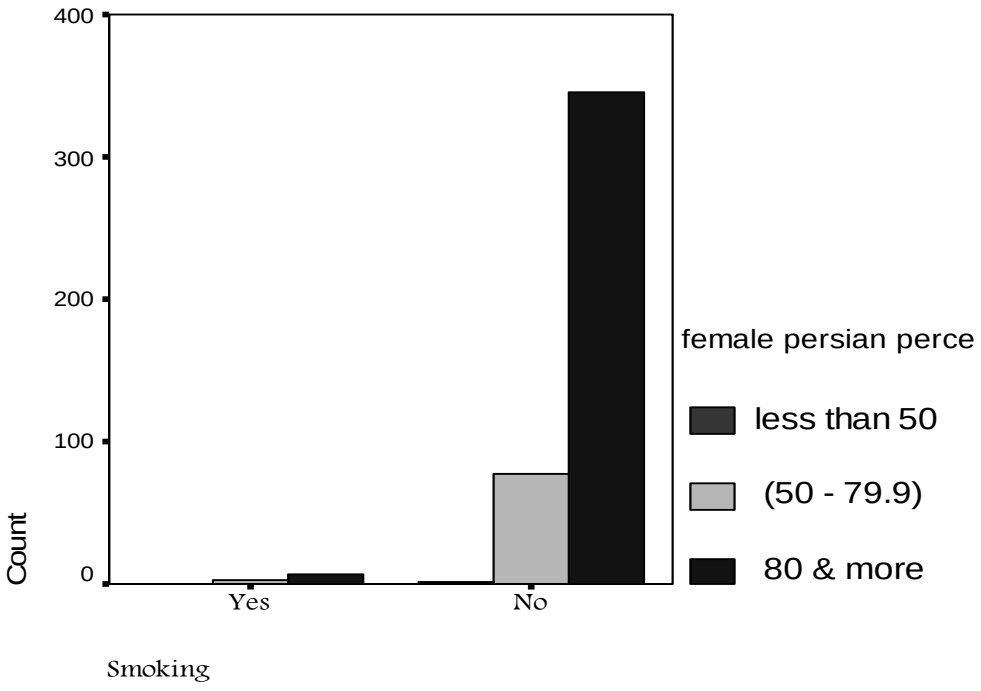


Figure 17. Smoking & Persian percent prediction for female less than 21

Table (36) Smoking & Persian percent prediction for female equal or more than 21 categorized

Smoking		Persian percent prediction for female equal or more than 21 categorized			Total
		Less than 50 (Dangerous)	(50-79 .9) (Caution)	80 and more (Normal)	
Yes	**Count**	2	6	1	9
	%	22.2%	66.7%	11.1%	100.0%
No	**Count**	66	289	71	426
	%	15.5%	67.8%	16.7%	100.0%
Total	**Count**	68	295	72	435
	%	15.6%	67.8%	16.6%	100.0%

Pearson chi – square = 0.421, p value = 0.810

Bars as shown below demonstrated this table

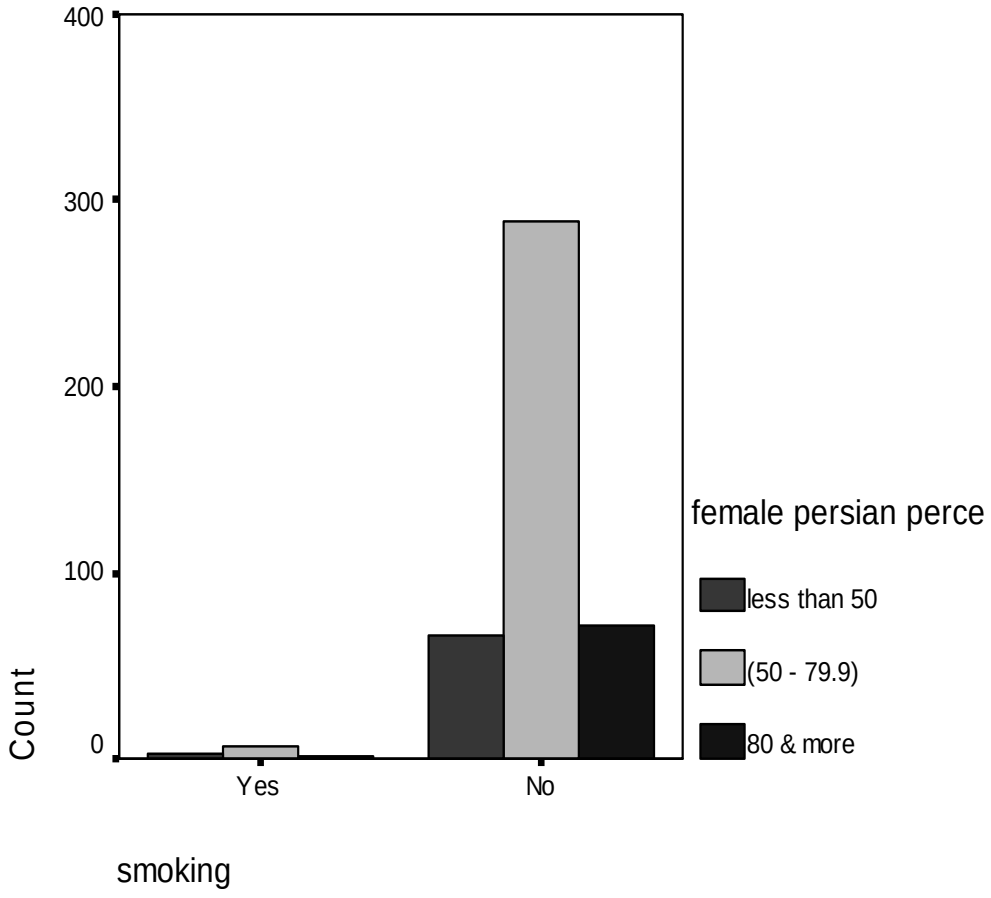


Figure 18. Smoking & Persian percent prediction for female equal or more than 21

3.3.11. Asthma & Persian percent prediction for female categorized

To test the relation between both variables Pearson chi–square was computed, the results were shown in the tables below

Table (37) Asthma & Persian percent prediction for female less than 21 categorized

Asthma		Persian Percent Prediction For Female Less than 21 Categorized			Total
		Less than 50 (Dangerous)	(50-79.9) (Caution)	80 and more (Normal)	
Yes	**Count**	0	7	4	11
	%	0	63.6%	36.4%	100.0%
No	**Count**	2	74	352	428
	%	0.5%	17.3%	82.2%	100.0%
Total	**Count**	2	81	356	439
	%	0.5%	18.5%	81.1%	100.0%

Pearson chi–square = 15.320, p value = 0 .000

Bars as shown below demonstrated this table

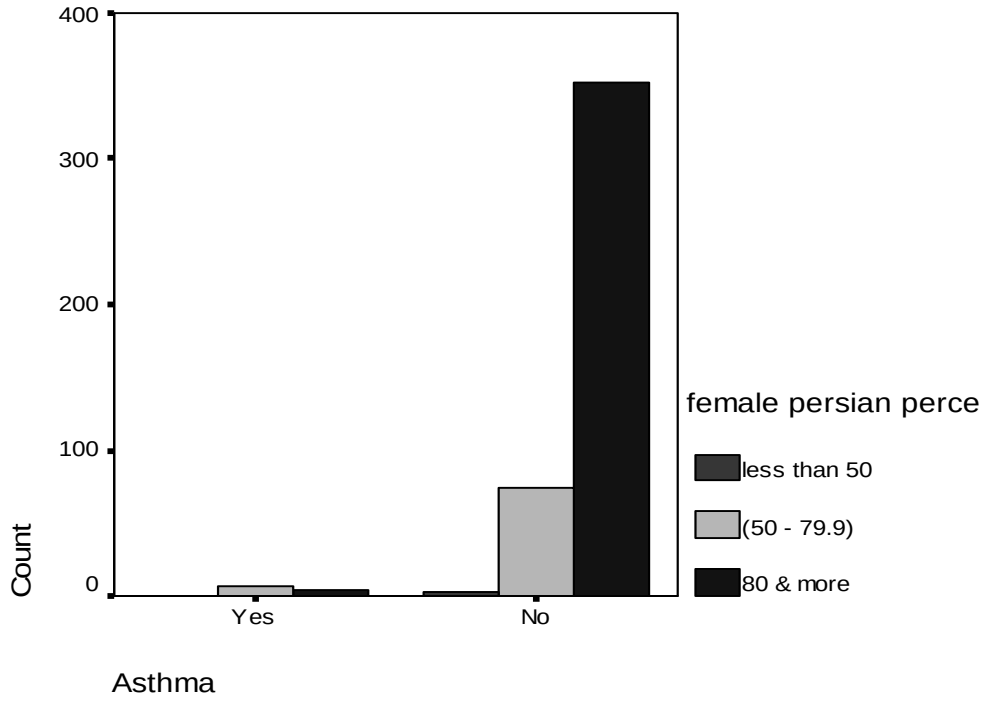


Figure 19. Asthma & Persian percent prediction for female less than 21

Table (38) Asthma & Persian percent prediction for female equal or more than 21 categorized

Asthma		Persian percent prediction for female equal or more than 21 categorized			Total
		Less than 50 (Dangerous)	(50 - 79.9) (Caution)	80 and more (Normal)	
Yes	**Count**	7	3	1	11
	%	63.6%	27.3%	9.1%	100.0%
No	**Count**	61	297	70	428
	%	14.3%	69.4%	16.4%	100.0%
Total	**Count**	68	300	71	439
	%	15.5%	68.3%	16.2%	100.0%

Pearson chi–square = 20.019, p value = 0.000

Bars as shown below demonstrated this table

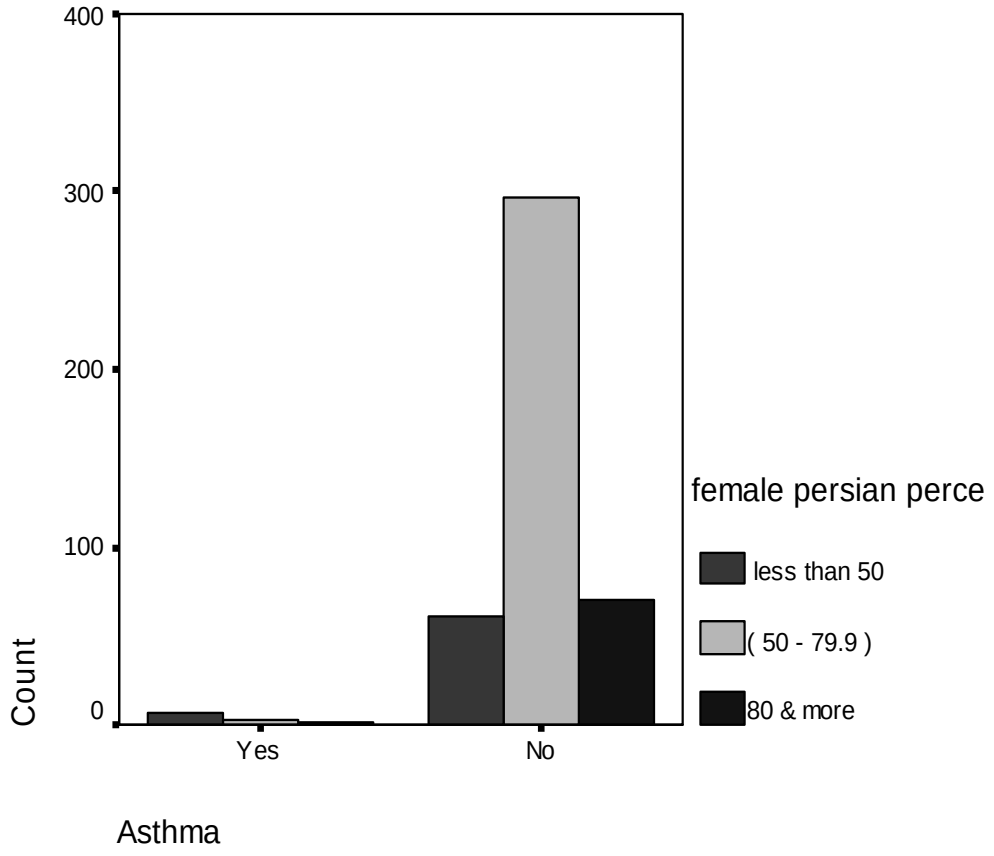


Figure 20. Asthma & Persian percent prediction for female equal or more than 21

CHAPTER FOUR

DISCUSSIONS

Discussion

Palestine, as a country in transition shifting from traditional to a modern society, has several unique features; the population is young with 46% being aged < 15 years (Census result summery 2001), an increase in the fertility rate, socioeconomic changes, and rural – urban migration. other special important changes imposed on Palestinian society is the different political, social economical, and environmental changes associated with current AL Aqsa Intifada, people have been exposed to different kinds of war gasses, tire burning fumes , building destruction ,and so on. The aim of this study is to assess the prevalence of asthma and allergy among An Najah University students and their possible risk factors, and in addition to test the value of using PEF in our target population.

4.1. Social profile

The researcher studied the social profile of the study sample through answers for related questions Q1-Q2 in the questionnaire (appendix 1) to have and idea about the social pattern of An Najah University students, which might be helpful in this study.

4.1.1. Socio demographic profile

In our study sample, we have a fair mix of males and females, most of the students were 20 years old or less , just 2.5% were older than 24. These results reflect the profile of under graduate students at An Najah University who are usually 18–20 years old. The percentages of the students in the sample from each college were representing the percentage of number of students in each college to the total students at the university. this table also shows that nearly half of the target population practice sport

while 42.8% didn't, and this indicate poor physical activity among this young aged students, (See table 5).

The majority of the students in the study sample had normal BMI (72.3%), 13.2 % were over weight, and only 2.2 % were obese, this result shows that students at An Najah University in general don't have weight problem, although there is convincing evidence that BMI has increased the last 10-30 years in developed countries (Turn bull et al 2004).

More than 90% of our samples were single & unemployed; this is an expected pattern for undergraduate students in Palestine and most of Arabic countries.

Regarding smoking, 17.6% of students in the target population were smokers, and 55.4% of the students in the study sample were exposed to environmental tobacco smoke in their houses, (See table 7).Effort need to be done by the university & health authorities to educate students about smoking risk.

When the target population were distributed according to their residence, the lowest percent of the student in the study sample were from refugee camps (3.8%), 46.1% of the target population were living in dormitories, which can be explained by political circumstances after AL Aqsa Intifada with closure & check points that makes transportation between Palestinian cities very difficult, (See table 8).

In regards to houses conditions, the results show that 60.2 % of the student in the study sample lived in houses < 20 years of ages, similarly most of the houses of students in the study sample were laid out in quiet places, the highest percentage of the student were living in stone houses, while the

lowest percent (3.1%) were living in asbestos building. Although the percent of asbestos building is low, it indicates an important need for raising awareness among students about asbestos & its hazardous effects on the lungs.

Regarding houses of study population, 41.8% of the students use gas for heating, 20.8% use coal, and 11.9% use kerosene. These results reflect the pattern of available sources for heating in Palestine.

The highest percent of the students in the study sample did not have any kind of animals in their houses. While 12.8 % had pigeons, 11.3% had cats, and 9% had chicken. These results indicate that acquiring pets is not very popular in Palestine, (See table 8).

Most of the target populations were using pillows made from cotton (38.2%), just 4.8% were using pillows made from feathers, and 24.3% were using pillows made from wool. Health education should be done for those who have asthma about minimizing dust by encasement mattress, box spring ad pillow by proof covers.

The lowest percentage (5.6%) of the target population had small size family (3 and less), while the highest percentage (69.4%) had large size family (7 and more); these results indicate a high fertility rate in Palestine.

The highest percent of the target population had 4 rooms in their houses, the lowest percent (4.8%) had 2 and less rooms .this reflects that majority of students at the university come from middle class, (see table 8).

About the planting around the target population houses, 42.4 % of the students in the study sample mentioned that fruitful trees were planted

around their houses, while 14.6% had wooded trees, these results reflect Palestinian tradition of planting trees around their houses.

4.2. Triggers that worsen or cause symptoms for population sample

The triggers that have large effect on health of population sample for allergic rhinitis were respiratory infections, tire burning and war gases, house dust, strong odors, auto exhaust, smoke and weather changes (49.7%, 49 .1 %, 46.7%, 40.6 %, 33.9%, 33.8%, 34.2%), respectively.

For asthma, the triggers were smoking, weather changes, auto exhausted, tire burning and war gases, exercise and respiratory infections (15.2%, 12.3%, 12.2%, 11.7%, 10.9% 10.6 %) respectively. While the triggers that have large effect on our study sample for skin allergy were insect and mold, latex, animals and food (17.2%, 15.8%, 10.7 %, 8.3%), respectively. And the rest has fewer effects as triggers for symptoms of asthma and allergy, (see table 9).

These results indicate that war gases and tire burning play an important role in worsening asthma and rhinitis symptoms that points the effect of political conflict and the use of war gases and tire burning on the health of our society.

An important observation in this study is that triggers that worsen asthma symptoms were nearly the same, which worsen the rhinitis symptoms. Different international studies have confirmed that allergic rhinitis is implicated as a trigger for asthma attacks among adults and children, so controlling allergic rhinitis appear to help control the symptoms of asthma, (Nayak 2003).

The effect of house conditions on asthma and allergy such as house dust

mite and home dampness in addition to indoor exposure to volatile organic compound were confirmed by other similar studies indicating that triggers at least maintain currently symptomatic asthma, allergic rhinitis, and atopic dermatitis, further more they increase susceptibility to common colds and possibly to other respiratory infections, (Kilpelainen et al 2001).

The effect of trees on triggering asthma and allergy were supported by several studies. Gilardiet et al, 1994 carried a study in southern part of Switzerland analyzing the effect of tree, mold spore, weed pollens in causing an inflammatory reaction, which found these factors to induce classical allergy.

Our study results show frequency smoking effect on asthma and allergic rhinitis. Several other studies pointed out that smoking produce adverse effect on airway of asthmatic individuals. (Thomson et al 2004), and exercise induces asthmatic reactions in about 17 million American, (J Resp Dis 2002).

The frequency percentage of effect of auto exhaust on asthma and allergic rhinitis indicate the crowding of vehicular traffic in small closed districts, this traffic problem and its associated emissions has been one of the major contributory factors to cause sharp rise in the prevalence of allergic disease, (Peterson and Saxon 1996).

Our results pointed to very strong effect of insect and molds in triggering skin allergy see table 9. Other studies pointed out that Sensitivity against mold spores was 2-9 %, (Gilardiet et al 1994) and stinging insects cause severe allergic reactions including generalized urticaria, angioedema, (Yunginger,1998).

4.3. The prevalence of asthma and allergy

In our study, the prevalence of asthma diagnosis was 0.33%, and the prevalence of ever wheezing was 0.46%, the prevalence of allergic rhinitis, skin allergy, latex rubber allergy, food allergy, drug allergy and insect sting allergy were 3.1 % 2.5% 0.26% 0.88% 0.67% and 2.5% respectively.

It is of notice that, while asthma prevalence is relatively low, allergic rhinitis and skin allergy are much higher. Similar findings were reported in some of the ISAAC studies in which higher prevalence rates for eczema were observed in countries with lower asthma prevalence rates, ISAAC 1998.

These results are consistent with findings of Janson et al which showed that atopy and bronchial responsiveness with high prevalence rate in English speaking countries and low prevalence rates in the Mediterranean region and eastern Europe, (Janson et al 2001).

Our Results were very close to a study carried out in Duzce in Turkey. Their results showed that the prevalence of childhood asthma diagnosed by physicians was 6.4%, AR was 3.35%, and eczema was 2.8%, (Uyan et al 2003).

Furthermore, in Jordan, a neighboring country with very similar social, cultural& environmental conditions, where a high percentage of the population are of Palestinian origin, the reported wheezing prevalence was 8.3%, but physician – diagnosed asthma was 4.1 %, (Abuekteish et al 1996). The difference in the physician – diagnosed asthma between the two countries might be due to variations in health prevention strategies including health education, or differences in healthcare provisions and services.

Two important studies on asthma carried out in Ramallah city, in the middle area of the West Bank by (Hasan et al 2000) and (EL Sharif et al 2002), found relatively low prevalence of asthma compared to international studies, although the prevalence rate in these two studies (3.8%, 9.4%) was higher than our results. This may reflect an underestimation of the diagnosis, or might be due to relatively small size of our study samples with respect to other two studies.

However, in Israel, which shares the same outdoor environment, as Palestine the prevalence for asthma and allergy for Israeli Jews and Arabs were markedly higher than that of our results& other two Palestinian studies. The Israeli study showed prevalence rate of asthma 12%, AR 14%, food allergy 7%, insect bite sting 3%, drug allergy 6%, and skin allergy 7%, the same study showed that allergic conditions were higher in the Israeli Arab population and those with low income and low education, (Shahar and Lorber 2001).

Another study was carried out on the differences in the prevalence of asthma and current wheeze between Jews and Arabs, showed that the prevalence of asthma and current wheeze was significantly higher in Jewish children compared with Arab children, (Shohat et al, 1997).

The observed difference in the prevalence of asthma and allergy between population in Palestine and population in Israel might give a clue to the pathogenesis of asthma and allergy, and this might be due to disparity in genetics due to population diversity (Kivity et al 2001), differences in lifestyle (Von et al 1994), including dietary factors (Hijazi et al 2000), or differences in the indoor environment and allergen exposure (Burr et al 1994).

The highest prevalence rate in the middle east was seen in Tehran (23.5%) had rhinitis, and the total prevalence for asthma was 3.5 % in general population and 7.2% in AR subjects, the prevalence of cautanous allergy also was 35.8% in children with AR, (Ghazi et al 2003).

4.4. Relationship

4.4.1. The relationship between allergies and social, environmental, and health profile

4.4.1.1. Allergic rhinitis and social, environmental and health profile relationship.

Our results show statistically significant relationship between allergic rhinitis and weight loss, deep sleeping, chronic respiratory infections, chronic abdominal pain, nasal polyps, anxiety, sleep apnea, chronic diarrhea and migraines at p value < 0.05 (see table 16).

Several studies have shown similar relationship results, (Salzano et al 1992) and (Akcakayan et al 2000).

The gender relationships with AR were not statistically significant (see table 12). A Sweden study also did not find difference between men and women in general population, (Druce et al 1998). However a study in Tehran, found a significant relationship was found between gender and AR, (Ghazi et al 2003).

The relationship between AR and residence and other social and environmental profile were statistically not significant, (see table 13).

The same relationship between allergic rhinitis and social and environmental factor have received little attention. A study carried out in

Tehran showed that environmental and social factors are important risk factors in the incidence of AR, (Ghazi et al 2003). Another study showed significant association between social and environmental factor with AR, (Kilpelainen et al 2001).

AR triggers can be allergic or non allergic in nature, the allergic triggers are house dust mite, pollen, animals, such as dogs and cats, fungal spores and cockroach, particles, the non allergic triggers include smoke and pollution from cooking fuels, wood smoke, smog, viral respiratory tract infections and weather changes (Mackay& Durham 1998). All the above triggers are found in urban, camp and rural environmental albeit to different extents. Individual characteristics seem to play important role in development of AR. These results pointed out to the importance of investigating the influence of interaction between atopic heredity and outdoor and indoor on the disease.

4.4.1.2. Relationship between asthma, social, environmental and health profile

The results show statistically significant association between asthma and gender, smoking, heart problems, chronic respiratory infections, thyroid disorder, angina, chronic diarrhea and glaucoma at p value < 0.05, (see table 17).

Our study confirms that there is a male predominance (see table 12), some studies in adults show that the atopy rate is 20 % higher in men than in women, (Leung et al 1997).

Some studies explained that the higher prevalence of asthma in boys could be a result of their smaller airways relative to lung size compared with

girls, (Tepper et al 1986).

Our results has demonstrated an association between smoking and asthma, several studies confirm that there has been well known association between tobacco smoking and COPD and suggestion for smoking to be an underestimated contributing factor to asthma development (Piipari et al 2004), other studies demonstrated that smoking was associated with increased prevalence of asthma in females, (Toren et al and Chen et al 1999).

However in our study, the number of smoking female was too small to have a statistically significant association with asthma.

Our finding of significant association between asthma and reported other medical disease was demonstrated by several other studies, (Djukanovic 1992 and Ferrari et al 2000).

The relationship between asthma and housing condition, environmental factor were not statistically significant (see table 17), however several other studies have shown a relationship between urbanization and asthma, in Scottland (Austin et al 1994), and in Saudi Arabia, asthma occurred more in children living in urban than those living in rural area (Ezeamuzei et al 2000), and in Palestine (Reuters medical news 2000).

The percentage of asthma in our study is slightly higher in villages (4.9%) in villages, than in cities (3.4%) see table 13.

A similar study (EL Sharif et al 2002), has the same conclusion in this regard and both studies might be explained by the fact that there are no big difference of life style between villages and cities. In both area people are

adopting semi – westernized "lifestyle.

Similar Studies from developed countries (Australia, UK) have found that children living in rural areas have the same rates of asthma as those in urban areas. In fact, a reversal of the picture in developing countries was found. In the USA (California), asthma was reported to be higher in rural areas (27 %) than urban areas (22.7 %), (Shaw et al 1990).

A study carried out in Palestine by EL Shirif et al 2002 indicated that children living in refugee camps in Palestine might be at high risk of developing asthma and asthma symptoms, According to this study, camps may be compared to the deprived inner cities of European or North – American towns (Krieger et al 2000) where a strong association between poverty rates and presence of asthma in children has been shown (Andrew et al 2000). However, our study showed no registered cases of physician diagnosed asthma in refugee camps.

This may be explained by small size of the student sample living in camps, another explanation that more frequent exposure to allergens is actually beneficial for early childhood, (Bour jaily, 2000).

The relationship between asthma and housing condition, animal trees, and environmental tobacco smoke were not statistically significant. However, several studies demonstrate the effect of home dampness, pollen and trees, pets, social economic factors which contributed to the prevalence of asthma and asthma symptoms, (Rona RJ 2000).

For example, a study showed that the prevalence of asthma and allergic disease was significantly lower in children whose homes were heated by coal or wood than in children living with a central heating system,

(Mutiuse et al, 1996).

An individual develops symptoms of allergies depends on the combined influence of a number of factors that can be genetic, environmental, infectious, physical, and /or hormonal (chang 2004).

Our results showed that the Prevalence of asthma does not appear to be related to the social or environmental factor but should be explained to associate with the increase of population susceptibility rather than change in exposure to allergens, (Kivity et al 2001).

4.4.1.3. The relationship between skin allergy, social, and environmental health profile

The relationship between skin allergy and gender, living place, the number of family members in house, heart problems, weight loss, deep sleeping, chronic abdominal pain, thyroid disorder, skin disorder, sleep apnea, chronic diarrhea, migraines, glaucoma, were statistically significant at p value < 0.05, see table 18.

In our study, the percentage of skin allergy was higher among males than among females (see table 12).

However, several studies in other parts of the world show a female predominance (Barian et al 1999). Several studies supporting our results showed that skin allergy might cause considerable physical and psychological disability including discomfort from itching, which may result in sleep loss, and secondary infection, as well as the psychological effects of a visible skin disease, (Sujc et al 1997, Greaves 2000, Snaches 1998 & Siri Carpetner 1999).

In our study, the percentage of skin allergy was found to be higher in the camps and rural area than urban area and the results were 60.5%, 36.4%, 22.4% respectively, (see table 13).

Similar findings were shown in a study carried out where the percentage of skin allergy were found to be higher in the rural area than urban area but allergists, studying children living on small farms have 75% fewer allergies than children without exposure to the environment of the villages, (Bourjaily 2000).

The refugee camps are characterized by poor housing conditions, dampness (which encourages the growth of moulds and house – dust mites), use of polluted fuels for home heating, and cooking without proper ventilation. In the past year, these conditions became even worse due to conditions imposed by Israeli occupation, which led to particularly strenuous circumstances for the refugee camp populations, studies show that home dampness at least maintains currently symptomatic asthma, allergic rhinitis and atopic dermatitis, (kelpelainen et al 2001).

Our finding of strong association between skin allergy and number of family in house confirmed several finding by (Siri Carpetner 1999).

The relationship between skin allergy and environmental factor in our study were not statistically significant (see table 18), although another study showed that the prevalence of asthma and allergic disease was significantly lower in children whose homes were heated by coal or wood than in children living with a central heating system, (Mutiuse et al 1996). The relationship between skin allergy and environmental factor in our study were not statistically significant. This variable didn’t receive enough

attention in similar studies around the world.

4.4.2. PEF relationships

Various factors influence the pulmonary function test, the most important ones being sex, age, race and height. Furthermore, individual factors such as environmental factors, socioeconomic status (Am Rev Respire Dis 1991), physique factor which is conceivable an indicator of respiratory muscle strength, and affected by exercise nutritional habits, overall health status, not by lung function alone, (Liou et al 1996).

4.4.2.1. Comparison between two based equations for PEF, Persian and Nunn and Gregg for the study sample

PEF is the maximum flow achieved during an expiration delivered with maximal force starting from the level of maximal lung inflation. The value obtained may differ depending upon the physical properties of the instrument used to measure it (Eur respire j 1997).

Tables 14 and 15 shows the average PEF scores for our study sample. These scores were calculated applying the Nunn and Gregg prediction equation and then applying the Persian equation.

These tables show that PEF value of An – Najah University students are much closer to the Persian equations compared to the Nunn and Gregg prediction equation references based on European populations, (see tables 14&15). This is quite true when it is applied to males and females whom are less than 21years old, or more and equal to 21 years old.

The highest percentage of values for males in both groups (< 21 or ≥ 21) when applying Persian equations were at normal range, while the highest

percentage of the same group with Nunn and Gregg equations were at caution range. Moreover, the correlation was statistically significant at p value = 0.01 (see table 14).

The highest percentage of values for females < 21 years old were at normal range applying Persian equation ,while the highest percentage of value for females for the same age group were at caution range when Nunn and Gregg equation were applied, see table 15.

However the highest percentage value for females ≥ 21 years old with both based equations were at caution range , and the correlation was statistically significant at p value =0.01.

Several studies have demonstrated ethnic differences in pulmonary functions (Yap et al 2001); prediction equations based on European population may not perform well on other population. A study carried out in Asfahan indicated that adult Persians have minimally lower pulmonary function value, while the values for children are close to USA whites (Golshan et al 2003). Applying European and Persian equations, our study indicates that Persian equations are more biologically and technically suitable for the interpretation of PEF measurement for Palestinian population.

Another study conducted by (Fulambraker et al 2004) showed that spirometric value for Asian Indians living in the United State were lower when compared to the values for whites. These differences have been explained by several factors mostly related to characteristics of body size, shape, and physique factors, which is an indicator of respiratory muscle strength, a factor affected by exercise, nutrition, and overall health status

(Korotzer et al 2000).

4.4.2.2 BMI & PEF Persian percent prediction for males & females

Several previous studies demonstrated strong association between BMI & PEF (Krotzer et al 2000).

Other studies show that weight loss reduces airways obstruction as well as PEF variability in obese patients with asthma, **(**Hakala et al 2000).Another study showed that has PEFR significantly related to height , age, surface area and weight , (Sagher et al 1999).

Our results show that the relationship between BMI & PEF Persian percent prediction for both groups (males & females) were not statistically significant see table (19,20,29 and 30).And this might be explained by that most of our study sample have normal BMI and normal Persian percent prediction value of PEF.

4.4.2.3. Sport practice& PEF Persian percent prediction for males & females

Our results show that the relationship between sport practice& PEF Persian percent prediction for both groups (males & females) were not statistically significant see tables (21, 22, 31, and 32). The pattern of sports practice was different between males and females about 2/3 of males practice sports for only ≈ 40% of females practice sports. However these different didn't affect the PEF value. According to Quanjer, physiological factors determine PEF in subjects whose lungs have not been affected by any pathological condition, (Quanjer et al 1997).

4.4.2.4. Smoking & PEF Persian percent prediction for males & females

PEF is impaired by previous or current smoking, even when unaccompanied by hyper secretion of mucus or any other symptoms (Gregg and Nunn et al 1989).

Our results show that the relationship between smoking & PEF Persian percent prediction for both groups (males & females) were not statistically significant, see tables (23, 24, 35, and 36). The percentage of smokers in this study was relatively small (17.6%), and the effect of cigarette on PEF may need a long time to be clear. Our result were confirmed by another studies showing that there were no significant differences in pulmonary function test results between the smokers and nonsmoker, (Kart et al 2002).

4.4.2.5. Residence & PEF Persian percent prediction for male & female

Several other studies indicate that individual factors such as environmental factors, socioeconomic status influence the pulmonary function test**,** (Am Rev Respire Dis 1991).

The most important environmental factors causing some deviation in pulmonary function test are environmental and industrial pollution. Living in towns and in industrial regions, being exposed to occupational, environmental or indoor pollution, having frequent respiratory illnesses, difficulties in reaching medical centers may all cause changes in pulmonary function test, (Am Rev Respire Dis 1991). Pulmonary function test parameters were found to be significantly low in the low-income

group, (Kart et al 2002).

Our results show that the relationship between residence & PEF Persian percent prediction for both groups (males & females) were not statistically significant whether in camp, village, or city, see tables (25,26,33,34). This may be due to the nature of Palestine as a small country with no significant difference in life style between camp, village and city.

4.4.2.6. Asthma & PEF Persian percent prediction for males & females

Many reports have emphasized the importance of measuring peak expiratory flow (PEF) in general practice. It has been reported to be useful in establishing a diagnosis of asthma and has been widely adopted for monitoring patients with asthma, (WHO Workshop Report 1995). In the consulting room, PEF is used for diagnostic purposes to identify reversible airflow limitation and it is applied at home to assess peak flow variability. PEF measurements might reliably replace forced expiratory volume in one second (FEV_1) in general practice since the correlation of PEF values with FEV_1 values has been found to be high, (Quanjer et al 1997).

Our results show that the relationship between asthma & PEF Persian percent prediction for male groups were not statistically significant, see tables (27, 28), while the relationship between asthma & PEF Persian percent prediction for female groups were statistically significant, see tables (37, 38).The tables show that females have higher percentage of caution than males.

These finding may be explained by several studies showing that; restrictions to PEF results must be applied, because PEF measurements are more effort dependent and may therefore underestimate the degree of

airway obstruction, (Cross et al 1991), and it may sometimes suffice to exclude the presence of airway obstruction at the time of measurement (Quanjer et al 1997). PEF testing to assess airway obstruction has the properties to be a good screening test but it was of less clinical value as a diagnostic test, (Thiadens et al 1999).

4.5. Limitation

- PEF readings well affected by the subject's sex, ethnic origin, age, stature, pathophisiological and physical factors, which is highly dependent on the correct technique. Although the correct technique was explained to the study sample students, these variations couldn't be eliminated.

- Study sample that elected to perform the test and fill the questionnaire were randomly selected and these young group were healthy in general. This reduced the power of our analyses to detect associations of PEF percent prediction value with various variables.

- The self reporting questionnaire was not properly filled and some of questions were not answered leading to relatively high missing values in some questions, despite the fact that researcher was holding group sessions to explain to students all the questions in the questionnaire.

4.6. Conclusion

Palestine, as a country in transition shifting from traditional to a modern society, has several unique features. Although the incidence of asthma is relatively small, there is an increase in the incidence of allergic diseases.

This is the first study regarding the prevalence of asthma and allergy & their risk factors among young adult aged population in Palestine represented by An–Najah University students.

The following are important results of this study:

- The prevalence of asthma and allergy in Palestine was markedly lower than other countries, for instance it was lower than Israel, while the highest prevalence rate in the region was seen in Tehran. Our Result was close to another study carried out in Duzce in Turkey, which ranks Palestine the lowest prevalence rate of asthma and allergy.

- Our results show statistically significant association between asthma and gender, smoking, chronic respiratory infections, with a male predominance.

- Our results show no statistically significant relationship of asthma with social or environmental factors.

- Our results show statistically significant relationship between allergic rhinitis and weight loss, deep sleep, chronic respiratory infections, nasal polyps, anxiety, sleep apnea, migraines but neither gender nor residence & environmental factors have statistically significant relationship with AR.

- The relationship between skin allergy and gender, living place, number of family members in house, weight loss, deep sleeping, skin disorder,

sleep apnea, was statistically significant with male predominance, and the percentage of skin allergy was found to be higher in the refugee camps and rural area than urban area.

- Young adult Palestinian have minimally lower PEF, and prediction equations based on European population may not perform well for them. Persian equations application for PEF value in young adult Palestinians are possibly more accurate.

4.7. Recommendations

During this study, we tried to highlight the need to know more about allergic disease prevalence and its risk factors particularly among young age population, which is considered an important group of the Palestinian society.

These are some recommendations and suggestions for further evaluation; we hope to consider them:

1. Relatively poor asthma and allergy awareness among An – Najah University students, which highlight the need for public health courses to be given to the university students.

2. Increase awareness about allergic disease, symptoms &complications in general population.

3. The need to develop standard management protocol and clinical practice guidelines on management of allergic diseases, particularly primary health care.

4. Action programs for health education to raise awareness about allergic disease, its prevention, control, complications and follow up.

5. The need of standardization and initiation of epidemiological studies to assess the size of problem of asthma and allergic disease throughout the region (Middle East & Arab world).

6. The need to increase the familiarity of physicians with diagnosis of asthma and allergic disease.

7. Empowering people to share responsibility in managing and monitoring

their allergic problem, by organized educational programs for those affected and their families.

8. Further studies regarding the influence of interaction between atopic heredity and environmental factors on the disease.

9. The need of routinely check up of peak expiratory flow for early detection of respiratory symptoms and asthma to decrease the cases of hidden or uncontrolled asthma.

10. The need to adopt our own formal of normal value of PEF.

REFERENCES

References

Abuekteish F, Alwash R, Hassan M, Daoud AS. **Prevalence** of **asthma and wheeze in primary school children in northern Jordan**. *Ann Trop Paediatr* 1996;16:227–231.

Akcakaya et al**. prevalence of bronchial asthma , allergic rhinitis in Istanbul school children.** *Eur J Epidemol* 2000; 16 (8): 693-9.

Al - Shehri et al***: screening for asthma and associated risk factors among urban school boys in abha city ,*** *medical Journal,* Vol.21 (11) 1048-1053; 2000.

AL- Riyam et al**: prevalence of asthma symptoms in Omani schoolchildren,** *SQU Jornal for scientific Research*, 1, 21-27; 2001.

Allergy online – Vienna medical school, Astria. available at ttp\\www.hon.ch\Library\Theme\Allergy\Glossary\Dermatitis.html

Altman DR, Chiaramonte LT**: Public perception of food allergy.** *J Allergy Clin Immunol* 1996 Jun (6): 1247- 51.

American lung association survey**, "highlight the quality of life of asthmatic patients",** 1998.

American thoracic society."**Lung function testing**": selection of reference values and interpretative strategies. *Am J Respir Crit Care Med* 1991; 144:1202-1218.

Andrew AC, Auinger P, Byrd RS, Weitzman M**. "Risk factors for pediatric asthma".** Contributions of poverty, race, and urban residence**.** *Am J Respir Crit Care Med* 2000; 162:873 – 877.

Annesi MI, Moreau D and Strachan D: **In utero and perinatal complications preceding asthma allergy**, 2001; 56, 491– 497.

Asthma and Allergy research, *Eur respire J* 2004; 23: 359-360**.**

Asthma UK**, "report on word asthma day", living on knife-edge;** highlighting the impact of severe asthma on people's lives, 2004.

Austin et al**. prevalence of asthma and wheeze in the highlands of Scotland.** *Arch Dis Child* 1994; 71: 211 - 216.

Bernhisel – Broadbent J**: Allergenic cross – reactivity of foods and characterization of food allergens and extracts.** *Ann Allergy Asthma Immunol* 1995 Oct; 75 (4) 295 -303; quiz 304-7.

Beyer et al**: association and linkage of atopic dermatitis with chromosome 13q12-14 and 5q31-33 markers.** *J Invest Dermatol***.** 2000; 115: 906 - 908.

Bindsley – Jensen C**. "ABC of allergies":** food allergy**.** *BR Med J* 1998; 316: 1299 -1301.

Bjorksten et al**: prevalence of childhood asthma, rhinitis and eczema in Scandinavia and Eastern Europe,** *Eur Respir J* 2004; 24: 734-739, P mid: 9727797.

Bourjaily, Philip "asthma **on the rise in the US**" environmental news network. sept 20, 2000: 1, 2.

Brand PLP, De GooijerA, Postma DS. **Changes in peak expiratory flow in healthy subjects and in patients with obstructive lung disease**. *Eur Respir J* 1997; 10: Suppl.24, 69s–71s.

Braun – Fahrlander C, Gassner M, Grize L, et al**. "Swiss study on childhood allergy and respiratory symptoms";** Air pollution (SCARPOL) team. No further increase in asthma, hay fever and atopic sensitization in adolescents living in Switzerland**.** *Eur Respir J* 2004; 23:407 -13.

Braun – Fahrlander C, Gassner M, Grize L, et al**. No further increase in asthma, hay fever and atopic sensitization in adolescents living in Switzerland.** *Eur respir J* 2004; 23: 407-413.

Burr ML, Limb ES, Andrae S, Barry DM, Nagel F. **Childhood** asthma **in four countries: a comparative survey**. *Int J Epidemiol* 1994; 23: 341–347.

Bush BK, Portnoy JM**. The role and abatement of fungal allergens in allergic disease.** *J allergy Clin immunol* 2001; 107: s 430-440.

Castro – Rodriguez JA, Holberg CJ, Morgan WJ, et al**: Increase in incidence of asthma like symptoms in girls who become over weight or obese during the school years.** *AMJ Respir Crit Care Med* 2001; 163: 1344 9.

CDC. fast stats A-Z**, advanced data from vital and health statistics**, no .346, table 13. august 26, 2004, web: http://www.cdc.gov\nchs \fastats\allergies.htm

CDC. national center for health statistics**. Vital and health statistics series**, 1996: Vol. 13, no. 134.

Census results – Summery **(Population, Housing, Buildings and Establishments)** www.PCBS.org.

Centers for Disease Control**. Forecasted state – specific estimates of self – reported asthma prevalence – United States,** *MMWR Morb Wkly Rep*. 1998; 47: 1022 -1025.

Chan–Yeung M**. "Assessment of asthma in the work place".** ACCP Consensus statement**.** *Chest* 1995; 108: 1084-1117.

Chang C. **hand book of nutrition and immunity**. 2004; pps 153- 186.

Chen Y. Dales R, Tang M, et al**. "Obesity may increase the incidence of asthma in women but not in men":** longitudinal observations from the Canadian national population health surveys. *AM J Epidemiol* 2002; 155-191.

Cross, S. Buck, S. Hubbard, J**: ABC of allergies, allergy in general practice,** *BMJ* 1998; 316: 1584- 1587.

Cross, s. Buck, s. Hubbard, d**. ABC of Allergy,** *BMJ 1998; 316: 1075.*

Cross D, Nelson HS. **The role of the peak flow meter in the diagnosis and management of asthma.** *J Allergy Clin Immunol* 1991; **87**:120-128.

De marco R, Locatelli F, sunyer J, Burney P**. "Differences in incidence of reported asthma related to age in men and women"**: a retrospective analysis of the data to the European Respiratory Health survey **.** *Am J Respir Crit Care Med* 2000; 162: 68 -74.

Djukanovic R, Wilson JW, Britten KM, et al**: Effect of an inhaled corticosteroid on airway inflammation and symptoms in asthma.** *Am Rev Respir Dis* 1992 Mar; 145 (3): 669 – 74.

Dr. J.K. Samaria**. Asthma – Genetic component,** department of chest disease 2002.

Dr. Joseph F. **Smith Medical library** 2005**,** www.chclibrary.org.

Dr. Matt Halls Worth, **National Asthma Campaign,** 2005.

Dr. S.K. Agarwla**. Gene and airways Remodling in asthma,** department of chest disease 2002.

Druce IIM. In: Middleton E, Reed CHE, Ellis EF, Adkinson NF, editors**.**

Allergy Principles and Practice USA: Mosby, 1998:1005-16.

Duran –Tauleria E, Rona RJ**. Geographical and socioeconomic variation in the prevalence of asthma symptoms in English and Scottish children.** *Thorax* 1999; 54: 476 -481.

Durham, S. **ABC of allergies, seasonal allergy,** *BMJ* 1998; 316: 607-610.

Dykewicz et al**. "Diagnosis and management of rhinitis":**complete guidelines of the Joint Task Force On Practice Parameters in Allergy, Asthma and Immunology**.** *AA Allergy Asthma Immunol* 1998 NOV; 81 (5 Pt 2): 478 -518.

EL- Sharif et al**: Asthma prevalence in children living in villages, Cities and Refugee camps in Palestine ,***Eur Respir J*, 19: 1026- 1034; 2002.

Elevated risk of anaphylactoid reaction from radiographic contrast media is associated with both beta blocker exposure an cardiovascular disorders .*Erratum in Arch Intern Med* 1993 NOV 8; 153 (21): 2421.

Ezeamuzie et al**. Asthma in the desert: spectrum of the sensitizing aeroallergens.** *Allergy* 2000; 55: 157 – 162.

F.A. Sagher, M.A. Roushdy and A.M. Hweta . **Peak expiratory flow rate nomogram in Libyan schoolchildren.** *Eastern Mediterranean Health Journal*1999; 5: 560-564.

Falade et al**: prevalence and severity of symptoms of Asthma, Allergic, Rhinoconjunctivitis, and atopic Eczema in (6-7) year old Nigerian primery school children "**the international study of asthma and allergies in childhood"**,** *medical principles and practice* 2004; 13: 20-25.

Ferrari M, Poli a, Olivieri m, et al."**Seroprevalence of Chlamydia**

pneumoniae antibodies in a young adult population sample living in Verona": European community respiratory health survey (ECRHS)**.** Infection 2000; 28: 38-41.

Foister et al**: linkage between atopy and the IgE high – affinity receptor gene at 11q13 in atopic dermatitis families.** *Hum Genet***.** 1998; 102: 236-239.

Formanek, R**. Food allergies, when food becomes the enemy.** *DEC* 2004.

Fulambarker et al. **Reference Values for Pulmonary Function in Asian Indians Living in the United States**. *Chest* 2004; 126: 1225-1233. Gazi et al**: Frequency of allergic rhinitis in school –age children [7-18 years] in Tehran,** *Iranian Journal of allerg , Asthma and immunology***,** Vol. 2. No. 4:181-184, December 2003.

Gilardi S. Torricelli R. peters AG. Wuthrich B**. pollinosis in canton Ticino, A prospective study in locarno. [German].** *Journal suisse de medicine* /124 (42): 1841-7, Oct 1994.

Global Initiative for Asthma. Global strategy for asthma management and prevention. *Publication No. 95 3659. NHLBI/WHO Workshop Report. Bethesda: National Institutes of Health, National Heart, Lung, and Blood Institute, 1995.*

Golden DB**."Stinging insect vaccines":** patient selection and administration of Hymenoptera Venom immunotherapy**.** *Immunol Allergy Clin* North AM 2000; 20: 553-70.

Golden, D. John's Hopkins university school of medicine**, stinging insect allergy,** *BMJ* 2003; 327:1229.

Goldman, M, Rachmiel, M, Gendler, L, et al**. "Decrease in asthma mortality rate in Israel from 1991 – 1995":** is it related to increased use of inhaled corticosteroids? *J Allergy Clin Immunol* 2000; 105, 71-74.

Golshan et al. **spirometric reference values in a large Middle Eastern population**. *Eur Respir J* 2003; 22: 529-534.

Greaves M**. chronic urticaria,** St John's Institute of Dermatology, St John's Hospital, United Medical and Dental School**, London, United Kingdom,** *Allergy Clin Immunol* 2000; 105: 664-72.

Habbick et al**: prevalence of asthma, rhinitis and eczema among children in 2 condition cities "**the international study of asthma and allergies in childhood**"** (*MAJ* 1999;160: 1824-8).

Hakala et al**. Effects of Weight Loss on Peak Flow Variability, Airways Obstruction, and Lung Volumes in Obese Patients with Asthma**" *Chest.* 2000; 118:1315-1321.

Hanifin JM, Toft S**. patient education in the long – term management of atopic dermatitis.** *Dermatol Nurs*.1999; 1: 4.

Hasan MM, Gofin R, Bar-Yishay E. **Urbanization and the risk of asthma among schoolchildren in the Palestinian Authority**. *J Asthma* 2000; 37: 353–360.

Hedman J, Kaprio J, Poussa T, et al**. "prevalence of asthma, aspirin intolerance, nasal polyposis and chronic obstructive pulmonary disease in a population - based study".** *Int Epidemiol* 1999; 28: 717-22.

Hijazi N, Abalkhail B, Seaton A. **Diet and childhood** asthma **in a society**

in transition: a study in urban and rural Saudi Arabia. *Thorax* 2000; 55:775–779.

Hopkin JM**. Mechanisms of enhanced prevalence of asthma and atopy in developed countries.** *Curr Opin Immumol* 1997; 9: 788 -792.

http://www.anaphlaxis.org.uk\whom.html

Huang Sl**; dietary factors associated with physician – diagnosed asthma and allergic rhinitis in teenagers,** clin exp allergy 2001; 31: 256-6.

International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee**. "Worldwide variation in prevalence of symptoms of asthma, allergic rhino conjunctivitis, and a topic eczema":** ISSAC .Lancet 1998; 351: 122532.

ISSAC steering committee**: word wide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema, "**the international study of asthma and allergies in childhood**"***(ISSAC) steering committee***, 1998; 351: 1225-32.

Jaakkola, M. Piipari, R. Jaakkola, N. and Jaakkola, J**: Environmental tobacco smoke and adult – onset asthma,** American college of chest 2004; 125: 1387-1393.

Jaakkola MS**. Environmental tobacco smoke and respiratory disease.** *Eur Respir monogr* 2000; 15: 322-383.

James, W. Avol, E. Rappaport , B. peters, M**: Family history and the risk of early – onset persistent, early – onset transient, and late – onset asthma,** epidemiology 2001; 5: 577 -83.

James JM**: adverse reactions to food**. in: Ziegler EE, filer LJ, eds. present

knowledge in nutrition.7th ed. **Washington,** DC: international life sciences institute; 1996: 604 -11.

Janson et al: **What are the main results so far?** *European community Respiratory health survey*, 18: 598-611, 2001.

Jarvis D, Chin S, Potts J, et al**. "Association of body mass index with respiratory symptoms and atopy":** results from the European Community Respiratory Health Survey**.** Clin Exp Allergy 2002; 32: 831–7.

Join Task Force on Practice Parameters, American Academy of Allergy, Asthma and Immunology, American College of Allergy, Asthma and Immunology, and the joint council of Allergy, Asthma and Immunology**. The diagnosis and management of anaphylaxis.** *J Allergy clin immunol*. 1998; 101 (6 pt 2): S 465–S 528.

Jones, AP, Bentham, G**. Health service accessibility and deaths from asthma in 401 local authority districts in England and Wales,** 1988 – 92**.** *Thorax* 1997; 52, 218– 222.

Kart et al. **Pulmonary Function Parameters in Healthy People in Urban Central Anatolia**.August 2002, Volume 3, Number 2, Page (s) 048-052.

Kilpelainen, M. Terho, E, Koskenvuo, M**: home dampness current allergic disease, and respiratory infections among young adults,** *thorax* 2001; 56: 462 – 467.

Kivity S, Sade K, Abu-Arisha F, Lerman Y, Kivity S. **Epidemiology of bronchial** asthma **and chronic rhinitis in schoolchildren of different ethnic origins from two neighboring towns in Israel**. *Pediatr Pulmonol* 2001; 32: 217–221.

Kogevinas M, Anto JM, Tobias A, et al**. "Respiratory symptoms, lung function and use of health services among unemployed young adults in Spain":** Spanish Group of the European Community Respiratory Health Survey**.** *Eur Respir J* 1998; 11: 1363 -1368.

Kongevinas et al**. "Occupational asthma in Europe and other industrialized areas":** a population – based study. European Community Respiratory Health Survey Study Group**. Lancet** 1999; 353: 1750 – 1754.

Korotzer et al. **Ethnic differences in pulmonary function in healthy nonsmoking Asian – American and European-American**. *Am J Crit Care Med* 2000; 161: 1101-1108.

Krieger JW, Song L, Takaro TK, Stout J**. "Asthma and the home environment of low – income urban children"**: preliminary findings from the Seattle – King County healthy homes project**.** *J Urban Health* 2000; 77: 50 – 67.

kurup vp, Shen HD, Banerjee b**. Respiratory fungal allergy microbes infect** 2000; 2: 1101– 1110.

Lazarou J, et al**. incidence of adverse drug reaction in hospitalized patients.** *JAMA* 1998; 279 (15):1200 -1205.

Leung et al**: prevalence of Asthma and Allergy in Hong Kong school children, "an ISSAC study",** *BMJ* 2004; 328: 386 – 387.

Leung et al**. Allergic sensitization to common environmental allergens in adult asthmatics in Hong Kong.** *Hong Kong medical journal* 1997; 3: 211-217.

Leynaert B, Bousquent J, Neukirch C, Liard R, Neukirch F. **"perennial**

rhinitis an independent risk factor for asthma in nonatopic subjects": results from the European Community Respiratory Health Survey**.** *J Allergy Clin Immunol* 1999; 104: 301 -304.

Liou et al.**Respiratory symptoms and pulmonary function among wood dust – exposed joss stick workers**. *Int Arch Occu Environ Health* 1996; 68:154-160.

Litonjua AA, Carey VJ, Weiss ST, Gold DR**. Race, socioeconomic factors, and area of residence are associated with asthma prevalence.** *Pediatr Pulmonol* 1999; 28: 394 – 401.

MacKay, I. and Durham, S. **ABC of Allergies Perennial Rhinitis** *BMJ* 1998; 316: 843.

Mannino et al**. Surveillance for asthma – United States, 1960 -1995.** *Mortal Rep CDC Surveill Summ***.** 1998; 47: 1-27.

Mayo clinic stuff, Double trouble**:** ***The link between allergies and asthma*****,** mayo foundation for medical education and research *(MFMER)***,** September 20, 2004.

Middleton E Jr, et al**. Allergy:** principles and practice**.** 5th ed. st louis: mosby, 1998; 1063 -72.

Mielck a, reitmeir p, Wjst M**.Severity of childhood asthma by socioeconomic status.** *Int J Epidemiol* 1996; 25: 388-393.

Miller AL Thorn Research**, the etiologies, path physiology and alternative complementary treatment of asthma,** *Altern med Rev* 2001; 6: 20- 47.

Miller MR, Dickinson SA, Hitchings DJ. **The accuracy of portable peak flow meters**. *Thorax* 1992; 47: 904-9.

Mutius et al**. "Relation of body mass index to asthma and atopy in children":** the national health and nutrition Examination study III**.** Thorax 2001; 56: 835.

Mutiuse et al, **"relation of indoor heating with asthma, allergic sensitization, and bronchial responsiveness**": survey of children in south Bavaria *BMJ* 1996 ; 312: 1448 – 1450 June.

National asthma campaign (1997)**: The incidence of asthma in the UK and causal agents**.

National asthma education and prevention program (national heart, Lang, blood institute) second expert panel on the management of asthma guidelines for the diagnosis and management of asthma update on selected topics 2002.

National asthma education and prevention program: expert panel report 2: Guidelines for the diagnosis and management of asthma NIH publication No. 97 - 4051. available at:

http://www.nhlbi.gov\guidlines\asthma\asthgdln.htm.bethesda

National center for health statistics**. Asthma prevalence, health care use and mortality,** 2000 – 2001**.** *center for disease control and prevention* **.** Reviewed June 2004.

Nayak, A**: The asthma and allergic rhinitis link.** *allergy asthma proc* 2003; 24: 595 – 602.

Newman – Taylor A**. Environmental determinants of asthma.** *Lancet***,** 1995; 345: 296 -9.

Newson R, Shaheen S, Burney P**. "Paracetamol sales and atopic disease in children and adults":** an ecological analysis**.** *Eur Respir J* 2000; 16: 817 -823.

Nugent JS et al**." Determination of the incidence of sensitization after penicillin skin testing."** *A A of Allergy, Asthma, and Immunology* 2003; 90 (4): 398 – 403.

Nunn AJ Gregg I. **New regression equations for predicting peak expiratory flow in adults**. *BMJ*. 1989; 298- 1068.

Odd et al**. "Association between breast feeding and asthma in 6 year old children":** finding of a prospective birth cohort study**,** *BMJ* 1999; 319: 815–9.

Om Kon, BS Sihra, Ch Compton , et al **Randomized, Dose – Ranging, Placebo – Controlled Study Of Chimeric antibody to CD4 (Keliximab) in Chronic Severe Asthma.** *Lancet* **.**1998; 352: 1109–1113.

Omenaas E, Jentoft HF, Vollmer WM, Buist AS, Gulsvik A**. Absence of relationship between tuberculin reactivity and atopy in BCG vaccinated young adults.** *Thorax* 2000; 55: 454-458.

Partridge,M, and Alwan, A**. Prevention of Asthma and approaches for enhanced care in the Eastern Mediterranean Region** 1997; 3: 133 -143.

Peterson B, Saxon A**: Global increases in allergic respiratory disease:** "the possible role of diesel exhaust particles"**.** *Ann Allergy Asthma Immunol* 1996; 77 (4): 263-68.

Picard et al**: Rate and place of death from asthma among different ethnic groups in Israel,** shaare zedek medical center**, Jerusalem, Israel,** 2002.

Picard et al**."Rate and Place Of Death from asthma Among Different**

Ethnic Group in Israel": National Trends 1998 to 1997**, Jerusalem,** Israel.

Piipari R, Jaakkola J, Jaakkola N, Jaakkola M**. smoking and asthma in adults.** *Eur Respir J* 2004; 24: 734–739.

Pornoy et al**. "Stinging insect hypersensitivity":** a practice parameter**.** *J Allergy Clin Immunol* 1999; 103 (5 pt 1): 963–80.

Quanjer et al**. Changes in peak expiratory flow in healthy subjects and in patients with obstructive lung disease**. *Eur Respir J* 1997; 10: Supp24, 69s–71s.

Quanjer et al. **Peak expiratory flow: conclusions and recommendations of a Working Party of the European Respiratory Society**. *Eur Respir J* 1997; 10: Suppl. 24, 2s–8s.

Riedler, J. Fahrland, C. et al. "**Exposure to farming in early life and development of asthma and allergy":** across – sectional survey *lancet*, 2001; 358:1129-33.

Robertson et al**: Asthma and other atopic disease in Australian children, "**Australian arm of the international study of Asthma and allergy in childhood**",** *MJA* 1998; 168: 434-438.

Rona RJ. Asthma **and poverty**. *Thorax* 2000; 55: 239–244. at:. www.unsco.org/.

Rosenstreich et al**. The role of cockroach allergy and exposure to cockroach allergen in causing morbidity among inner – city children with asthma.** *N Engl J Med* 1997; 336: 135663.

Rumchev, K**: Indoor environmental risk factor, for respiratory symptoms and asthma in young children,** *BMI* 2004; 89: 423- 426.

Salzano et al**. "Allergic rhinoconjunctivitis: diagnosis and clinical assessment".** *Rhinology* 1992; 30 (4): 265-75.

Sampson HA**: Fatal food – induced anaphylaxis.** *Allergy* 1998; 53

(46 suppl): 125–30.

Scoppa J. **"Rhinitis (allergic and vasomotor)" In:** MIMS Disease. **Sydney.** *IMS publishing*, 1996: 450 -51.

Shahar et al**: prevalence of Self – Reported Allergic conditions in An adult population in Israel,** *IMA J***. Haifa. Israel.** 2001; 3: 190-193.

Shaw RA, et al**. Increasing asthma prevalence in rural New Zealand adolescent population:** 1975 – 1989**.** *Arch Dis Child* 1990 ; 65 : 1319 –23.

Shohat et al**: Differences in the prevalence of Asthma and current wheeze between Jews and Arab "results** from a national survey of schoolchildren in Israel**",** *Ann Allergy Asthma Immunol*, 89: 386-392; 2002.

Silva, G. Sherrill, D. Guerra, S and Barbee, R**: Asthma as a risk factor to COPD in a longitudinal study,** *Chest* 2004; 126: 59 – 65.

Siri Carpetner . **Modern hygiene's dirty tricks**, 1999.

Snaches A, Schammanf, Garcia AJ**. Chronic angioedema,** *Allergy immuno pathol***.** 1998; 26, 4: 195-8.

Specter, S. **Path physiology and pharmacotherapy of allergic rhinitis.** *J Allergy Clin Immunol* 1999; 103: S 377-404.

Spitzer et al**. The use of beta – agonists and the risk death and near death from asthma.** *N Engl J Med* 1992; 326, 501–506.

Stafforini et al**: "Deficiency of platelet activity factor acetyhydrolase is a severity factor for asthma",** university of Utah**, USA,** 1999.

Su JC, Kemp AS, Varigos GA, Nolan TM**. "Atopic eczema: its impact on the family and financial cost".** *Arch DI Child* 1997; 76: 159 – 162.

Tatter field AE**,** *Knox AJ***,** *Britton JR and Hall IP* **Asthma.** *Lancet***,** 2002; 360, 1313-1322.

Tepper RS, Morgan WJ, Cota K, Wright A, Taussig LM, GHMA Paediatricians**. Physiological growth and development of the lung during the first year of life.** *Am Rev Respir Dis* 1986; 134: 513-519.

The Allergy Report**: Science Based Findings on the Diagnosis and Treatment of Allergic Disorders,** American Academy of Allergy, Asthma and Immunology *(AAAAI)***,** 1996–2001.

The impact on the Palestinian economy of confrontations, mobility restrictions and border closures. United Nations Unies report 2000; 2: 5–7. WWW.unsco.org/.

Thiadens HA, De Bock GH, Dekker FW, *et al*. **Identifying asthma and chronic obstructive pulmonary disease in patients with persistent cough presenting to general practitioners: descriptive study**. *BMJ* 1998; **316**: 1286-1290.

Thomson NC, Chaudhuri R, Livingston E**. Asthma and cigarette smoking.** *Eur Respir J* 2004; 24: 822 -833.

To, T, Dick, P, Feldman, W, et al**. A cohort study on childhood asthma admissions and readmissions.** *Pediatrics* 1996; 98, 191-195.

Treatment of exercise induced asthma, *J Resp Dis* 2002; 23: 423 – 432.

Turnbull A, Barry D, Wickens K, et al**. "Changes in body mass index in 11-12 year old children in Hawkes Bay, new Zealand" (1989–2000).** *J Paediatr child health* 2004; 40: 33-7.

Upton et al**: Intergenerational 20 year trends in the prevalence of asthma and hay fever in adult, "the midspan family study surveys of parents and offspring",** *BMJ* 2000; 321: 88-92.

Uyan AP, Gozukara A, Yesildal N: **prevalence of asthma and allergic disorders among children in duzce, turkey**. *The internet journal of epidemiology*.2003.v1.n1.

Vally H, Taylor M, and Thompson P**. "The prevalence of aspirin intolerant asthma (AIA) in Australian asthmatic patients"**: western Australia 2001.

Von Mutius E, Martinez FD, Fritzch C, Nicolai T, Roell G, Thiemann HH**. Prevalence of asthma and atopy in two areas of West and East Germany.** *AM J Respir Crit Care Med* 1994; 149: 358 -364.

Von Mutius E**. The burden of childhood asthma.** *Arch Dis child* 2000; 82 Suppl.2, 112-115.

Weido AJ, Sim TC**. The burgeoning problem of latex sensitivity Graduate medicine,** 1998; 3: 173-184.

Wein, H**. Fighting Seasonal Allergies,** *NIAID* June 2002.

Wood cock A, custovic A **."Avoiding exposure to indoor allergens", ABC of allergies,** *BMJ* 1998; 316: 758.

Wuthrich B**. Epidemiology and natural history of Atopic dermatitis.** *Allergy Clin lmmunol Int* 1996; 83: 77-82.

WWW. clevelandclinic.org\ healthy.

WWW .hon .ch\Library\Theme\Allergy\Glossary\allergen.html

WWW.peakflow.com

Yap et al. **Ethnic differences in anthropometry among adult Singaporean Chinese, Malays and Indians, and their effects on lung volumes** .*Respir Med* 2001; 95: 297-304.

Yemaneberhran et al**. Prevalence of wheeze and asthma and relation to atopy in urban and rural Ethiopia .***Lancet* 1997; 350: 85-90.

APPENDIX

معدل انتشار الربو و الحساسية بين طلبة جامعة النجاح الوطنية

معلومات عامة

الجنس: ذكر أنثى

الفئة العمرية: (17.5 – 20) (20.5 –22) (22.5–24) (أكثر من 24)

الوزن : ( ) **الطول:** ( )

الكلية: _____ **التخصص:** _____

تمارس الرياضة: (نعم ، لا)

1) **<u>معلومات شخصية</u>:**

1. الحالة الاجتماعية: (أعزب – متزوج)

2. المهنة: (1– موظف 2– عامل 3– غير ذلك)

3. الأعمال التي تمارسها كثيرا: (1– خياطة 2– طبخ 3– عناية بالحدائق 4– رسم 5– تصوير فوتوغرافي 6– غير ذلك)

4. أنت مدخن: (نعم ، لا)

5. إذا كانت الإجابة السابقة بنعم، منذ كم سنة و أنت مدخن: 1 – (أقل من 5) 2– (5–10) 3 – (10 – 15) 4 – (اكثر من15)

6. كم هو متوسط عدد السجائر اليومية؟ 1– (اقل من10) 2– (10–20) 3– (20–30) 4– (اكثر من30)

7.هل تدخن النرجيلة: (نعم ، لا)

8.إذا كانت الإجابة السابقة بنعم ، كم مرة يحدث ذلك؟ 1– (يوميا) 2– (2–3مرات أسبوعيا) 3– (2–3مرات في الشهر)

9. هل امتنعت عن التدخين؟ (نعم ، لا)

10.إذا كانت الإجابة السابقة بنعم،منذ كم سنة توقفت عن التدخين؟ 1- (اقل من 3) 2- (3-7) 3 - (7-10) 4- (اكثر من 10)

11. هل هناك مدخنين داخل بيتك؟ (نعم ، لا)

2) <u>بيئة السكن</u>: (أضع دائرة أو اكثر حول الإجابة التي تتناسب مع البيئة التي أعيش فيها)

أ. أعيش في (1- مخيم 2- قرية 3- مدينة)

ب. أعيش في سكن جامعي (نعم ، لا)

ت.عمر بيتي الحالي هو 1- (اقل من 20) 2- (20 -50) 3- (اكثر من50)

ث. يقع بيتي في منطقة فيها (1- مصانع 2- حقول 3- اكتظاظ سكاني 4- منطقة سكنية هادئة)

ج. من الأشجار و الأعشاب التي تحيط في بيتي: (1 - أشجار حرجية 2- اشجار مثمرة 3- ورود 4- غير ذلك)

ح. نوع البناء الذي أعيش فيه (1 - بناء حجر 2- بناء مسقوف باسبست 3- بناء من طوب)

خ. من أنواع التدفئة التي اعتمدها في بيتي ، تدفئة تعمل على (1- الكهرباء 2- الكاز 3- الغاز 4- احتراق الفحم 5- تدفئة مركزية 6- مكيف 7- جدران بيتي عازلة للحرارة)

د.من أنواع التبريد التي اعتمدها في بيتي (1- مروحة 2- مكيف 3- نوافذ البيت)

ذ. من الحيوانات التي اقتنيها في بيتي (1- قطة 2- كلب 3- عصافير 4- دجاج 5- ماعز 6- حمام 7- غير ذلك 8- لا شيء)

هـ. من الحيوانات التي توجد في مكان قريب من بيتي (1 - قطة 2- كلب 3- حصان 4- قطيع من الأغنام و البقر 5- دجاج 6- غير ذلك 7- لا شيء)

ز. من أنواع الوسائد التي استخدمها في غرفتي وسائد محشوة في (1- القطن 2- الإسفنج 3- الريش 4 - الصوف 5 - غير ذلك)

س. يغطي بلاط منزلي شتاء (1- موكيت 2- سجاد 3- لا شيء)

ش. عدد أفراد الأسرة القاطنين في بيتي _____

ص. عدد الغرف في بيتي _____

3) **أي هذه المثيرات تؤثر في صحتك و تجعلك عرضة لمضاعفات صحية ،ضع اشارة (×)في العمود الذي يحمل الأعراض التي تنطبق على حالتك:**

المثيرات	أعراض في الأنف والجيوب و العين و الأذن	أعراض الربو و القصبات الهوائية	أعراض الطفح لدي و الحكة الجلدية
1) الحقول/ الحدائق العامة /الحدائق المنزلية			
2) غبار المنزل (تنظيف- مسح- شفط -الغبار رائحة زيت القلي)			
3) الحيوانات (قطة – كلب – طيور – غير ذلك)			
4) أمراض الجهاز التنفسي			
5) ممارسة الرياضة			
6) أوقات الليل			
7) الروائح القوية (منظفات- مواد الدهان)			
8) مواد التجميل- عطور- ملطف جو)			
9) مثيرات نفسية (توتر – قلق – ضحك)			
10) دخان السجائر والنرجيلة			
11) إحراق إطارات السيارات- هدم المنازل- إعطاب الشوارع أثناء الاجتياحات الإسرائيلية- غاز مسيل الدموع)			
12) استخدام التكييف			
13) تقلبات الطقس			
14) استخدام الأدوية			
15) الأطعمة (منتجات الألبان- فواكه مجففة- بيض- المعلبات)			
16) بعض أنواع الأنسجة (أطراف			

القميص–ملابس السباحة– ساعة اليد– قفازات مطاطية			
17) الدورة الشهرية و الحمل			
18) أوقات الصباح			
19) لدخان المتصاعد من عوادم السيارات			
20) صبغة الشعر			
21) حشرات ،عفن			

4) أقرا الأعراض الآتية ثم أضع إشارة (×) في العمود الأكثر توافقا مع حالتي الصحية:

الأعراض	حاد جدا	حاد	متوسط	خفيف	غير موجود
1. سيلان من الأنف					
2.عطاس					
3.احمرار، حكة في العين					
4.حكة في الأنف					
5.حكة في الحلق					
6.حكة في الأذن					
7.نزف من الأنف					
8.صعوبة في التذوق والشم					
9.صداع					
10.غزارة الدموع					
11. قحة +/– بلغم					
12.ضيق في التنفس					
13.ضيق في التنفس يتبع ممارسة الرياضة					
14.تضخم في الحلق					
15.اختناق					
16.تنفس مصحوب بزفير					
17.ماء تحت الجلد					
18.جفاف الجلد					
19.تشقق الجلد					
20.حكة جلدية					
21.طفح جلدي					

5) أضع دائرة أو اكثر حول المشكلة الصحية التي عانيت أو لا زلت أعاني منها

1) حساسية الأنف	2) الربو	3) طفح جلدي	4) حكة جلدية
5) حساسية تجاه بعض الأطعمة	6) حساسية تجاه بعض الأدوية	7) حساسية تجاه الأنسجة المطاطية	8) حساسية تجاه لسعات بعض الحشرات

6) هل الأعراض السابقة التي تعانيها تختلف باختلاف الفصول الأربعة؟ (نعم ، لا)

إذا كانت الإجابة بنعم ، ضع إشارة (×) أمام الفصول التي تعاني فيها من الأعراض السابقة:

الأعراض	الربيع (آذار- أيار)	الصيف (حزيران – آب)	الخريف (أيلول- تشرين ثاني)	الشتاء (كانون أول- شباط)
1) حساسية الأنف				
2) الربو				
3) حكة جلدية				
4) طفح جلدي				

7) اجب على هذا السؤال إذا كنت تعاني أعراض الربو:

أ) أنت تعاني الربو بشكل: 1- يومي 2- اكثر من مرتين أسبوعيا 3- اقل من مرتين أسبوعيا 4 – متقطع

ب) توقظك أعراض الربو من نومك ليلا؟ (نعم ، لا)

ج) إذا كانت الإجابة السابقة بنعم ، فان ذلك يحدث: 1- (ليليا) 2- (2-3 في الأسبوع) 3- (خمس مرات في الشهر) 4- (اكثر من خمس مرات في الشهر)

د) أدون عدد المرات التي اضطرتني إلى دخول المستشفى بسبب أعراض الربو في الأشهر الاثنا عشر الماضية _____

هـ)عدد المرات التي تناولت فيها كورتيزون في الأشهر الاثناعشر الماضية (أقراص ،حقن)
1- (2-3 في الأسبوع) 2 – (2-3 في الشهر) 3- (سبع مرات في الشهر) 4 – (اكثر من سبع مرات في الشهر)

و) من أيام الدوام الجامعي أو أيام العمل التي خسرتها بسبب أعراض الربو في الأشهر الاثنا عشر ا الماضية: 1- (مرة في الشهر) 2- (مرتين في الشهر) 3 – (3-6 مرات في ال شهر) 4- (اكثر من ست مرات في الشهر)

8) أقرا المشاكل الصحية الآتية ثم أجيب بـــ (نعم ، لا) حسب ما ينطبق على حالتي الصحية في الوقت الحالي:

المشاكل الصحية	نعم	لا	المشاكل الصحية	نعم	لا
1. مشاكل في القلب			11. قرحة في المعدة		
2. سكري			12. مشاكل في الغدة الدرقية		
3. فقدان الوزن			13. مشاكل في الجلد		
4. نوم عميق			14. نوم متقطع		
5. ارتفاع الكلسترول في الدم			15. ذبحة صدرية		
6. التهاب مزمن في القصبات الهوائية			16. حصوة في الكلية		
7. آلام في البطن مزمنة			17. إسهال مزمن		
8. زوائد لحمية في الأنف			18. صداع نصفي		
9. توتر نفسي			19. فقر دم		
10. لين عظام			20. ماء زرقاء في العين glaucoma		

9) أضع دائرة حول المشاكل الصحية التي قد واجهتني في الزمن الماضي:

1. ربو	2. طفح جلدي	3. مشاكل في الغدة الدرقية	4. التهابات متكررة في القصبات الهوائية
5. التهابات متكررة في الأذن	6. السل	7. جراحة في الجيوب	8. صداع نصفي
9. التهابات متكررة في الجيوب الأنفية	10. حكة جلدية	11. استئصال اللوزتين	12. استئصال زوائد لحمية من الأنف

10) <u>تاريخ العائلة الصحي</u>:أضع دائرة أو اكثر حول المشكلة الصحية التي يعانيها أحد أفراد أسرتي بما في ذلك (الأبوين ، الأعمام ، العمات ، الأخوال ، الخالات ،الخالات،الاخوة ، الأخوات)

1. حساسية الأنف	2. الربو	3. حكة جلدية	4. حساسية من بعض الأدوية	5. حساسية من بعض الأطعمة
6. طفح جلدي	7. ماء زرقاء في العين	8. صداع نصفي	9. أمراض في المفاصل	10. التهاب الرئة المزمن
11. تليف في الرئة	12. زوائد لحمية في الأنف	13. مشاكل في الجيوب الأنفية	14. توتر نفسي	15. نقص في المناعة
16. ارتفاع ضغط الدم	17. سكري	18. مشاكل في الغدة الدرقية	19. حساسية من لسعات بعض الحشرات	20. موت في مرحلة الطفولة

11) نتيجة فحص PEF_____

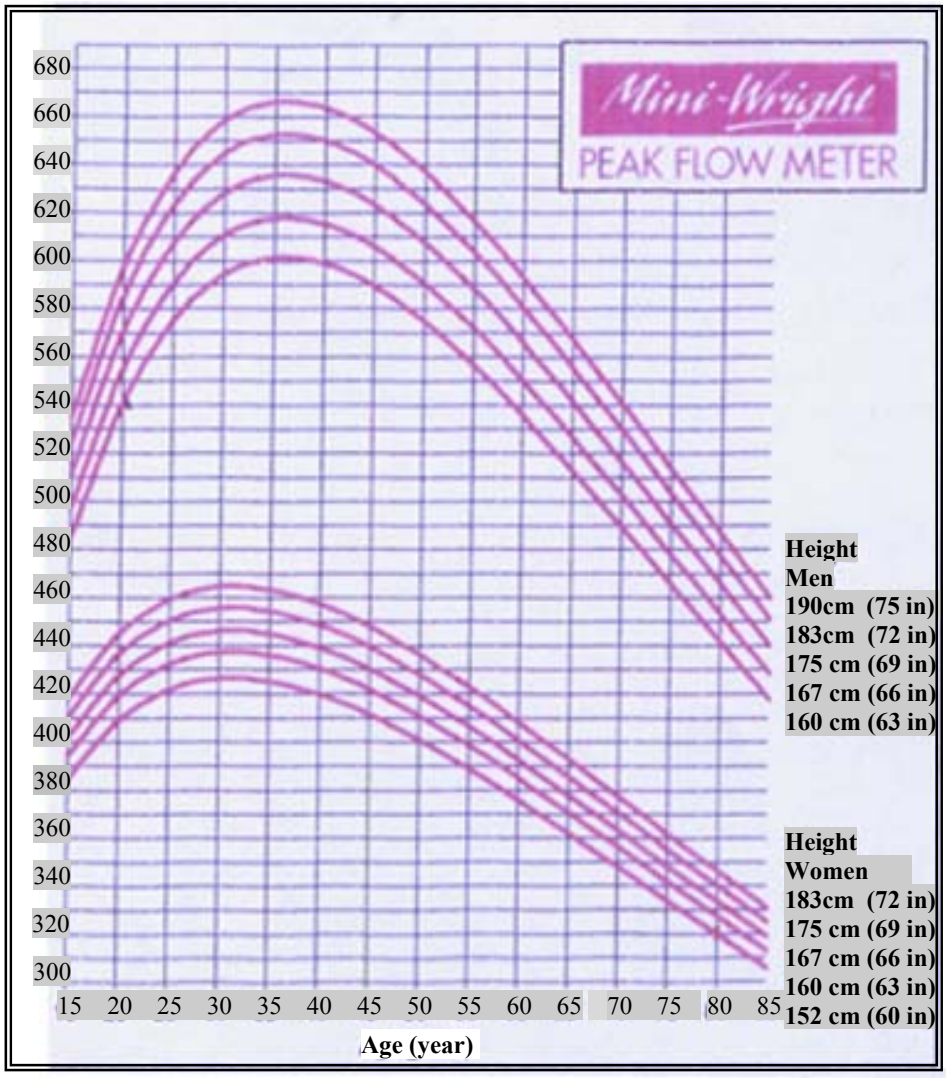
***بإشراف* د. محمد مسمار و د. سمر غزال مسمار**

إعداد الطالبة: وفاء ميناوي

Peak Flow Meters Group

peak-flow meters group at www.peakflow.com

Peak Expiratory Flow Rate - Normal Values



Adapted by Clement Clarke for use with Eu 1 3826/ Eu scale peak flow meters from Nunn AJ, Gregg I, Br Med J 1989:298;1068-70. at: www.peakflow.com

جامعة النجاح الوطنية
كلية الدراسات العليا

معدل انتشار أمراض الربو والحساسة وعوامل الخطر المتعلقة بها بين طلبة جامعة النجاح الوطنية، نابلس، فلسطين

إعداد
وفاء علام ذيب ميناوي

إشراف
د. محمد مسمار
د. سمر غزال مسمار

قدمت هذه الأطروحة استكمالا لمتطلبات درجة الماجستير في الصحة العامة بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس، فلسطين.

2005

معدل انتشار أمراض الربو والحساسية وعوامل الخطر المتعلقة بها
بين طلبة جامعة النجاح الوطنية، نابلس، فلسطين

إعداد
وفاء علام ذيب ميناوي
إشراف
د. محمد مسمار
د. سمر غزال مسمار

الملخص

تعتبر أمراض الربو و الحساسية من المشاكل الصحية الخطيرة في الولايات المتحدة و في الدول الصناعية في العالم، نظرا لارتفاع نسبة الإصابات بهذه الأمراض، بالإضافة إلى الدور الذي تلعبه أعراضها في الحد من فاعلية الأفراد المصابين و منعهم من قيامهم بنشاطاتهم اليومية، كذلك لارتباطها الوثيق بأمراض أخرى.

لقد تم حديثا تسليط الضوء على مدى أهمية التحكم بهذه الأمراض و علاجها لتأهيل الأفراد المصابين بها عن طريق التثقيف الصحي و المشاركة المجتمعية و للحد من المشكلات الصحية المرتبطة بها.

تم إنجاز هذه الدراسة من اجل معرفة عدد حالات أمراض الربو و الحساسية و عوامل الخطر المتعلقة بها بين الشباب اليافعين في فلسطين ممثلين بطلبة جامعة النجاح الوطنية في نابلس . و قد تم اختيار هذه الفئة العمرية لأننا لم نتمكن من إيجاد دراسات سابقة خاصة بهذه الفئة العمرية (27 – 18)، حيث تم اختيار ألف طالب و طالبة من جامعة النجاح بصورة عشوائية كعينة دراسية. قامت الباحثة بجمع البيانات على هيئة تعبئة نموذج استبانه من قبل الطلبة ثم قياس PEF لكل طالب في عينة الدراسة. و تم إدخال نتائج قراءة الجهاز في معادلات يعتمدها المجتمع الأوروبي و أخرى تعتمدها دراسة إيرانية لحساب القراءة المرجعية الطبيعية لكل شخص حسب الطول، الجنس و العمر. ثم تم تحليل كافة البيانات باستخدام البرنامج الإحصائي SPSS.

بالرغم أن بعض النتائج لم تتوافق مع ما سبقها من دراسات فيما يتعلق بعوامل الخطر لأمراض الربو و الحساسية و المعروفة عالميا، فإننا حصلنا على العديد من النتائج الهامة لهذه الدراسة.

فيما يلي أهم النتائج التي تم التوصل إليها خلال هذه الدراسة:

- بينت الدراسة أن معدل الإصابة بأمراض الربو و الحساسية بين طلبة جامعة النجاح الذين يمثلون الشباب اليافعين في فلسطين بلغت كالتالي : الربو 33%.، تنفس مصحوب بالصفير بشكل دائم 0.46%، حساسية الأنف 3.1%، حساسية الجلد 2.5% ، حساسية تجاه الأنسجة المطاطية 0.26% ، حساسية تجاه بعض الأطعمة 0.88%، حساسية تجاه بعض الأدوية 0.67%، و حساسية تجاه لسعات الحشرات2.5% و عندما قورنت نتائج هذه الدراسة بدراسات أخرى أشارت النتائج إلى أن نسبة الإصابة في فلسطين اقل بكثير منها في إسرائيل و قريبة من نتائج دراسة أخرى أجريت في تركيا .

- نسبة الإصابة بأمراض الربو و الحساسة الجلدية عند الذكور أكبر منها عند الإناث في الفئة العمرية المذكورة.

- أعلى نسبة مئوية لأمراض الربو كانت للطلبة الذين يقطنون في القرى، أما أعلى نسبة مئوية لأمراض الجلد و الحساسية فكانت لهؤلاء الذين يقطنون في المخيمات.

- بينت الدراسة انه لا توجد علاقة إحصائية هامة بين حساسية الأنف أو إمراض الربو مع العوامل البيئية التي قد تلعب دورا هاما في إحداث هذه الأمراض.

- الظروف المعيشية و السكنية السيئة في المخيمات تجعل ساكنيها من هذه الفئة العمرية عرضة لأمراض الحساسية الجلدية.

- القيمة المرجعية لنتائج فحص كفاءة الرئة للفلسطينيين اقل منها عند الأوروبيين و ذلك لأسباب عرقية, لذا يجب اعتماد المعادلات الواردة في الدراسة الإيرانية عند استخدام فحص PEF.

الحاجة إلى دراسات أوسع و اشمل تتعلق بأمراض الحساسية و الربو و علاقتها بعوامل وراثية و بيئية.