Abstract
The type and frequency of diseases in a community represents genetic structure, nutritional status, social health standards, and the cultural traditions of the community. In addition, the different types of disorders that are common in an area are directly or indirectly under environmental effects. The epidemiological information of these disorders is important when developing health services programs and influences the way medical services are offered.

The aim of the present study was to determine the epidemiology and frequency of ocular diseases in patients referred to the Ophthalmic Clinic of Shahid Rahnemoon Hospital, Yazd, Iran. A cross-sectional descriptive study was done by means of a questionnaire and statistical analysis on the data collected. A total number of 994 patients were surveyed and more than 70 types of disorders were diagnosed. The disorders were classified into 15 main groups. The most commonly detected conditions in the patients were refractive errors and conjunctival diseases (16.9% each), followed by disorders of the lens (12.7%), retinal diseases (11.9%), eye traumas (11.9%), eyelid disorders (7.3%) and glaucoma (5.2%). The majority of the patients were more than 40 years old. Regarding their education, most of them were illiterate. Most of the patients were housewives. Our results showed that the majority of the patients were living in urban areas. An association of diabetes and hypertension was seen more with retinal disease than with other conditions.

Keywords: Epidemiology, ocular diseases, medical services

Introduction
Epidemiology is the study of the distribution and determinants of health-related states or events in specified populations, and thereafter the application of such information to the control of health problems. Because of the importance of epidemiological data, the World Health Organization (WHO) developed centers to gather reliable data in sixty countries. In ophthalmology, these data are used for planning reliable programs for prevention of blindness. In establishing these programs, early detection of high-risk patients and understanding the prevalence of diseases is a necessity. Although prevalence of some ophthalmic disorders such as conjunctival diseases, refractive errors, cataract, diabetic retinopathy, glaucoma and age related macular degeneration (ARMD) is reasonably well known in many areas of the world it has not been documented in Yazd province, (Iran), yet. Therefore, we decided to study common ophthalmic problems in this area to determine the relevant educational, therapeutic and health demands.

Materials and Methods
This descriptive cross sectional study was conducted as a descriptive cross sectional study on patients referred to the Eye Clinic of Shahid Rahnemoon Hospital during the first six months of 2003. The sampling method was in the for-
Demographic characteristics and incidence of ocular disease in patients at Shahid Rahnemoon Hospital (Yazd, Iran)

Figure 1. The ocular disease frequency based on main group disorders.
Amblyopia was detected only in 10.5% of the patients in the age group under 14 years old and in 1.1% of the age group 15 to 24 years old, but there were no cases in other age groups. Most cases of refractive error were in age group 15 to 24 years old (32%).

Regarding the patients’ education, 38 patients were under 7 years old and the others were classified into five groups of: illiterate, primary school, secondary school, high school and university educated. Approximately 54% of patients were illiterate or had primary school education. The most common disease in these two groups was lens diseases (29.5%) and then retinal diseases (20.9%). In the patients with secondary school education and higher, refractive error (22.6%) and conjunctival disease (21.5%) were the most frequent complaints.

Of the 994 cases, 151 were under 15 years old. The other 843 cases were classified into the following occupational groups: 1-Farmer and worker; 2-Official staff; 3-Self employee; 4-House keeper; 5-Student and soldier; 6-Retired and unemployed. The majority of patients were house keepers (group 4) (32%) followed by the farmers and workers (22%). Students and soldiers were the least referred group (9.7%). In farmer and workers group, trauma (23.8%) and conjunctival diseases (17.3%) were the most frequent ocular diseases.

### Table 1. The ocular disease frequency based on main group disorders.

<table>
<thead>
<tr>
<th>Diseases group</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conjunctiva disease</td>
<td>168</td>
<td>16.9</td>
</tr>
<tr>
<td>Refractive error</td>
<td>168</td>
<td>16.9</td>
</tr>
<tr>
<td>Lens disease</td>
<td>127</td>
<td>12.7</td>
</tr>
<tr>
<td>Retinal disease</td>
<td>119</td>
<td>11.9</td>
</tr>
<tr>
<td>Trauma</td>
<td>119</td>
<td>11.9</td>
</tr>
<tr>
<td>Eyelid disease</td>
<td>73</td>
<td>7.3</td>
</tr>
<tr>
<td>Glaucoma</td>
<td>52</td>
<td>5.2</td>
</tr>
<tr>
<td>Cornea</td>
<td>35</td>
<td>3.5</td>
</tr>
<tr>
<td>Uvea and sclera</td>
<td>26</td>
<td>2.6</td>
</tr>
<tr>
<td>Lacrimal system</td>
<td>25</td>
<td>2.5</td>
</tr>
<tr>
<td>Strabismus and nystagmus</td>
<td>23</td>
<td>2.3</td>
</tr>
<tr>
<td>Amblyopia</td>
<td>17</td>
<td>1.7</td>
</tr>
<tr>
<td>Orbital disease</td>
<td>15</td>
<td>1.5</td>
</tr>
<tr>
<td>Optic nerve</td>
<td>12</td>
<td>1.2</td>
</tr>
<tr>
<td>Vitreous and aqueous</td>
<td>12</td>
<td>1.2</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>3</td>
<td>0.3</td>
</tr>
</tbody>
</table>

![Figure 2. The ocular disease frequency based on the sex.](image-url)
while in the retired and house keeper groups lens diseases were most frequent (20.4%). Most glaucoma patients (9.8%) were among the unemployed and retired patients. Most of the patients (68.7%) were living in urban areas while 31.3% of them were living in rural areas. No significant relationship was found between eye diseases and habitation locality. The most frequent cause of referral in urban patients was conjunctival disease, while in rural patients refractive error and lens disease were more common. Frequency of lens disease in rural patients (17.7%) was higher than urban patients (10.5%) while the frequency of trauma was lower in rural patients (8.2% versus 13.8%).

In total 17.5% of the patients had diabetes. 71.4% of the patients with retinal disease, 32.3% with lens diseases and 28.8% of the patients with glaucoma had diabetes. Hypertension was found in 12.6% of patients and was more associated with retinal diseases (32% of retinal disease patients had hypertension).

In this study 22.9% of patients were referred by general practitioners while others came to the clinic by themselves.

Discussion

Knowledge of disease epidemiology is an essential prerequisite for prevention and control of diseases. Although frequent studies have been done in other countries to evaluate the prevalence of common eye diseases, limited studies have been done in Iran for this purpose.

Prevalence of diseases is varying under the effect of predisposing factors. Etiological factors in disease can be divided into genetic and environmental factors. Increased environmental allergens, ozone layer changes, increased ultraviolet irradiation, nutritional habits, occupational accidents and interacial mixtures are among the factors that can change the epidemiology of diseases.

Conjunctivitis is the most frequent eye disease in the world. This study indicated that conjunctival diseases (16.9%) and refractive errors (16.9%) occurred most frequently. Allergic conjunctivitis was the most common complaint that was seen in males (58.3%) more than in females (41.6%). In the by Bagheri and Zare study, conjunctivitis was more frequent in males (67.1%) and most of them were referred during spring and summer. In the Mirjalili study, 14.4% of their patients had conjunctivitis but no significant difference was found in the frequency of this disease between males and females. Both of these studies were conducted in Iran. In addition, studies in other countries have shown that conjunctival disease especially allergic types are one of the main ophthalmic problems. In one study, symptoms of vernal catarrh were seen in 21% of British people. A survey in Italy showed that 38% of people have had allergic conjunctivitis with the manifestation of rhino-conjunctivitis (63.7%), atopic conjunctivitis (21%) and vernal conjunctivitis. What is important in allergic diseases is their high incidence not their severity. One of the most important eye diseases that may be associated with allergic rhinitis is vernal catarrh.

Signs and symptoms of allergic conjunctivitis includes red eye, foreign body sensation, photophobia, burning, itching, blurring of vision and dry eye. Symptoms of conjunctivitis are more severe in men than women. This possibly could be due to more outdoors activities and therefore exposure to allergens in men.

The other types of conjunctival disorders are pterygiums, which are an irritating phenomenon due to ultraviolet radiation, dry and dusty air. In different studies frequencies were between 0.13 to 7% while its frequency was 2.4%. In this study the warm and dry climate of Yazd, located near the central desert of Iran was the reason for the high frequency.

Another common disease in the study was refractive error (16.9%) that was more frequent in women than men. The frequency of refractive error was 14.8% in the study by Mirjalili with more prevalence in women (52.6%). In a survey by Crawford and Hamer in Hawaii, the effect of nationality and race on the frequency of refractive error was studied and they found that in 17% of Chinese, 13% of Korean, 12% of Japanese, 12% of Caucasian, 9% of Hispanics and 7% of Portuguese. These results confirm that refractive error is influenced by genetic factors.

In this study, lens diseases were observed in 12.7% of patients and were more frequent in women and the patients above 60 years old. The most significant disease of this group was cataract. In the Bagheri and Zare study, 52.8% of patients with cataract were women and 75% of them were
between 60-80 years old. Also, 54.4% of cataract patients were women in the study by Mirjalili. Multiple studies have been done about cataract risk factors which indicate that the most important factor is the age. The other risk factors include; ultraviolet B, diabetes, female gender, myopia, oral beta blockers, steroids, hypertension, nicotine, alcohol, dehydration and diarrhea. McCarty et al. indicated that prevalence of cortical cataract was 11.3%, nuclear cataract was 12.6% and posterior sub-capsular cataract was 4.9% in Australia. Overall, cataract is the most important worldwide cause of blindness, including more than half of cases. For example, there are 22 million cases of blindness in India and cataract responsible for 80% of them. Morphologic varieties of senile cataract have different biochemical specifications. Most of the cortical and sub-capsular cataracts are affected by environmental factors such as ultraviolet radiation, diabetes and drugs. Again, multiple studies show that cortical and nuclear cataract are more prevalent than the sub-capsular types. Supplemental vitamins especially antioxidants (A, C and E) have significant roles in decreasing cortical and nuclear cataract frequency while cigarette smoking increased cataract and ARMD prevalences. In our study cataract was accompanied with diabetes in 32.2% of the cases. The other studies indicate a 3-4 times increase in cataract prevalence among diabetics.

Retinal diseases were detected in 11.9% of the patients in this study. The prevalence of retinal diseases, in the Mirjalili study, was lower than in our study (5% versus 11.9%). The most important disorder of retinal diseases was diabetic retinopathy. The frequency of diabetic retinopathy increases with increasing age and duration of disease. In our study most of the diabetic patients were above 40 years old and one of the most important retinopathy risk factors was duration of diabetes. It was shown that prevalence of retinopathy in diabetic patients after 3 years is 8% while after 5, 10 and 15 years this prevalence was 25%, 60% and 80% respectively.

Similar to the retinal diseases, the frequency of trauma was 11.9% among our patients. Previous studies have shown that 5% of ophthalmic disorders are because of trauma and it happens before 25 years of age in more than half of cases. Most cases of trauma in this study occurred in the 25-39 years old group and then in the 15-24 years old group. Prevalence of eye trauma in men (18.8%) was significantly more than women (4%) in our study. Similarly, in an epidemiological study of eye trauma by Farvardin and Mahdizadeh, trauma occurred in men three times more than in women. They showed that most injuries occurred in spring. Also they showed that the most important risk factor of eye trauma was occupation and sport injuries.

It is estimated, in year 2000, that approximately 67 million cases had glaucoma in the world. In our study 5.2% of the patients had glaucoma. Unfortunately there is no precise and complete study about prevalence and incidence of glaucoma in Iran. Lai et al. showed that the incidence of glaucoma among Hong Kong Chinese population was 10.4 cases per 100,000 per year. They showed that the most important risk factor for glaucoma was ageing and positive family history, respiratory infection and antitussive drugs. A survey in Italy shows that 25% of glaucoma cases are angle closure predominantly the chronic type. In this study the frequency of glaucoma was 5.8% in the 40-59 years age group and 12.8% in the cases above 60 years old. Also 28.8% of glaucoma patients were among diabetic patients.

In our study the frequency of amblyopia in the less than 14 years age group was 10.5%, of them 58.8% were females and 41.2% were males. In the study by Javadi and Ahmadi the frequency of amblyopia was 6.6% which 52% of them were females. In the United States prevalence of amblyopia has been estimated to be 2-2.5%.

This study showed that among the referred patients to the Eye Clinic, refractive error conjunctival disorders, trauma, diabetic retinopathy and amblyopia were the most frequent causes of referral. These disorders are major causes of visual loss that are preventable with rational and precise health programs.

References
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