Determining Effective Factors on Uncorrected Refractive Errors of High School Students in Zahedan using Statistical Logit Model

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Abstract
In this paper, uncorrected refractive errors which is a common disease worldwide will be discussed. If refractive errors are not determined and then corrected, they will lead to other serious consequences. In fact, if effective factors on uncorrected refractive errors are not realized early, they can change from a small problem into a bigger one and sometimes irreparable problem. One of interesting methods to determine important factors of disease in medical issues is statistical Logit model fitness. This model has satisfactory characteristics, frequently used in medical issues. The most important feature is its linearity.

1. Introduction
Recently, numerous statistical methods have been studied to determine important factors of disease in medical issues. Particularly, Logit model fitness with linearity feature and satisfactory characteristics frequently is implemented in medical sciences. In this study, Logit model is applied to determine effective factors on uncorrected refractive errors of high school students in Zahedan.

It is an important case study for researchers to determine important factors of uncorrected refractive errors which is one of the most common diseases worldwide (particularly in Iran). However heredity is one of the most important factors of this sickness, this factor cannot be alone depended on because many various factors are involved in. The most serious types of uncorrected refractive errors are Myopia, Hyperopia, and Astigmatism. If the symptoms are not determined and then corrected, they will lead to other consequences such as vision loss, and accordingly weakened education, job, and life, tiredness, neurological and psychological consequences, dizziness, nausea, depression, strabismus (deviation of the eyes), etc. In this paper, well-known statistical Logit model fitness was applied to determine important factors of disease in medical issues which has satisfactory characteristics and frequently been used in medical issues.

According to researches, almost 28 per cent of population in the country suffer from uncorrected refractive errors. Uncorrected refractive errors consist of visual impairments including Myopia, Hyperopia, and Astigmatism. Also, half of people suffering from uncorrected refractive errors were born with such impairments and the rest developed after their births. On the other hand, preventing uncorrected refractive errors is possible among 20 per cent of individuals who developed uncorrected refractive errors after the birth. Thus, accurate examining and screening are highly regarded in this field. At the moment, 550 thousand patients suffer from severe uncorrected refractive errors in the country. Also, there are 120 thousand partially sighted and blind...
people in the country. According to national statistics, two million people use glasses in Tehran. Nowadays, Iran is ranked the 16th concerning uncorrected refractive errors in the world. High statistics of uncorrected refractive errors indicate regular screening and examining plans. He pointed out that, according to WHO reports, Iran has successfully acted toward screening and eye-disorder treatment in Eastern Mediterranean Region3.

These days, millions of people enjoy their lives without glasses or lenses in spite of suffering from uncorrected refractive errors. This fact is resulted from laser operation progresses in uncorrected refractive errors. According to statistics till 2012, total number of 30 million people experienced laser operation for uncorrected refractive errors worldwide. It seems that laser correction of uncorrected refractive errors will become the most common operation within the next five years. Two decades has passed from the first operations of uncorrected refractive errors by laser devices. During these years, laser devices have considerably progressed concerning treatment methods. Presenting new lasers has accelerated operation growth of uncorrected refractive errors through increased diagnosis and new treatment methods. Therefore, if uncorrected refractive errors are diagnosed early, they can be cured as a result of some solutions such as operation because quality and safety improvement of modern treatment methods along with patients’ information expansion through media such as the Internet and Television caused applicants to make informed decision. Ophthalmologists also provide better and more accurate results concerning different types of uncorrected-refractive-errors operations through increased knowledge3,4.

Uncorrected refractive errors are when images are not concentrated on retina and individuals develop them. Uncorrected refractive errors fall into three types: Myopia, Hyperopia, and Astigmatism. Nearly 50% of people need glasses or lenses to correct uncorrected refractive errors (Myopia, Hyperopia, and Astigmatism)4,5.

2. Symptoms of Uncorrected Refractive Errors

2.1 Blurry Vision

Blurry vision is the most recognizable weakened eyes. The higher the eyes are weakened, the more the blurry vision will be.

2.2 Eyestrain

Eyestrain is one of most important factors of weakened eyes especially when individuals take advantage of their eyes for work.

2.3 Headache

Headache is one of recognizable symptoms of weakened eyes especially when individuals have degrees of Hyperopia and Astigmatism. These people develop headache quickly while doing tasks which need vision accuracy (in particular in fore head). This type of headache is not severe and the pain is released by resting6.

The objective of this paper is to study the uncorrected refractive errors among male high school students in the city of Zahedan concerning social, cultural, economic, and physical states of students as well as their families using general linear Logit model7.

Since no interference was made while conducting this study, it is a cross-sectional, non-experimental, and applied research. Statistical population consists of male high school students in the city of Zahedan. Statistical volume was randomly selected among all male high school students. Samples were those studying in high school level.

Sample volume: In cross-sectional studies, presence or absence of disease as well as variables for each society member are studied. In above mentioned statistical population, the minimum sample volume consists of 266 individuals by confidence level of 95%, p = 0.5, error of d = 0.6, and using \( n = \frac{Z^2pq}{d^2} \) formula. Total number of 280 people was added to reach more accurate results. Also, sampling was done from different regions including rich, medium class, suburbs, and slums6,8.

In this paper, independent variables are parents’ family relationships, father’s jobs, student’s order concerning birth in the family, number of family members, mother’s job, level of father’s education, level of mother’s education, and BMI. Dependent variables are final diagnosis of uncorrected refractive errors among students.

To study statistically, SPSS 18 software was used. Backward stepwise method was used to enter data9. The Table 1 shows the coefficient values.

Backward stepwise method enter all variables into model in order to select main variables. Then in the next stage, each insignificant variables leave the model and the model is fitted again. This continues until all variables become significant. We used the same method10,11.
Finally, we concluded that father’s age, mother’s age, number of children, and birth order remain in the model. Final model is as following:
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y = 0.5989 + 0.0477(FAGE) + 0.0028(MAGE) - 0.5287(NUMBER) - 0.5978(ORDER).
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This is the general statistical Logit model. According to this model, father’s and mother’s ages influence uncorrected refractive errors directly. Number of children and birth order enjoy reverse impact on occurrence of uncorrected refractive errors.

### 3. Conclusion

Determining the important factors of uncorrected refractive errors which is one of the most common diseases worldwide can control the prevalence and risk factors of this sickness\(^3\)\(^,\)\(^4\)\(^,\)\(^12\)\(^,\)\(^13\). As mentioned if the symptoms are not determined on the right time, they will lead to other physical and mental problems. In this paper, well-known statistical Logit model fitness was applied to determine important factors of disease to predict high risk cases. According to this model, father’s and mother’s ages influence uncorrected refractive errors directly. Number of children and birth order has reverse impact on occurrence of uncorrected refractive errors.

### 4. References

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