

# Impact of Refractive Error Correction on the Performance of Industrial Workers

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## ABSTRACT

**Objectives:** To assess the impact of refractive error correction on industrial productivity and find out the barrier to wearing glasses. (Lumax Industries at Dharuheda, Gurugram, Haryana)

**Materials and methods:** Prospective study was selected from 121 subjects to evaluate the refractive error using the retinoscope (Heine Beta 200) by a team comprising of an Optometrist from Amity University, Gurgaon, and given the corrective glass to those who were prescribed the correction. After 3 months of gap again the productivity data were collected for all the samples and analyzed.

**Result:** 121 were male subjects. Their mean age of  $34.80 \pm 7.96$ . 52% for distance correction and 48.6% were presbyopia correction. Out of 121 subjects, 47 needed corrections but only 17 subjects are using spectacle. After 3 months we found that there was no significant difference in the number of products manufactured after dispensing spectacles due to less follow-up, cost, and cosmeses, and will use spectacles in the future.

**Conclusion:** A significantly higher proportion of industry workers have poor vision due to refractive error.

**Keywords:** [Impact of refractive error, myopia, hypermetropia, astigmatism]

## INTRODUCTION

Uncorrected refractive error is the leading cause of avoidable blindness and visual impairment globally which is commonly found in rural or remote areas and undeveloped areas. Refractive errors are very simply diagnosed and managed by pair of spectacles<sup>1</sup>. All these types of refractive errors like myopia, Hypermetropia, astigmatism, and presbyopia when left uncorrected or the correction is inadequate than it can causes severe visual impairments or even more blindness<sup>2,3</sup>. May be many reasons for not addressing the refractive error like lack of awareness, lack of recognition by individuals or family members, limited availability or affordability of refractive services and glasses and discourage the use of glasses. Globally uncorrected refractive

error is responsible for 43 percent of global vision impairment with 5 million blind people<sup>4</sup>. The majority of refractive error cases are undetected and untreated which makes the refractive error most leading cause of blindness in children and adolescents. Due to this uncorrected refractive error, more than 12 million visually-impaired children age group 5 to 15 suffer critical setbacks in development since learning is often visually based on uncorrected refractive error the more than 12 million visually-impaired children ages 5 to 15 also suffer critical setbacks in development since learning is often visually-based<sup>5</sup>. The major impact of uncorrected refractive error people is not able to work properly and family pushed towards poverty<sup>6,7</sup>. Our aim of refraction camp programmers for correction of refractive

error should be delivery of equitable affordable eye care so that all those who can benefit from refractive services get the correction and support they need.

**MATERIALS & METHODS**

This prospective study was conducted in Lumax Industries at Dharuheda over a period of 4 months. A total 121 of subjects were included those are coming for eye testing and to evaluate the refractive error using the retinoscope (Heine Beta 200) and visual acuity by Snellen's chart. Those were vision less than 6/6 go for the refraction and prescribe glasses. We categorized the refractive error: Myopia, Hypermetropia, astigmatism, and presbyopia. After 3 months of using spectacles, we collect the company productivity data to observe is there any improvement or not. Also, evaluate the barrier to not using the spectacles.

**RESULT**

Data was entered in MS Excel and analyzed using SPSS version 17. The mean was calculated for continuous variables and proportions for the categorical variables. A total of 121 male subject's mean age was  $34.80 \pm 7.9$ . Among the subject's a total of 30 eyes are 6/9 unaided distance vision, 14 eyes are 6/12 unaided distance vision, 5 eyes are 6/18 unaided distance vision and 7 eyes are 6/24 unaided distance vision [Table 1]. In near vision 30 eyes are able to read the N8 line, 8 eyes are able to read the N18 line, 4 eyes are able to read the N12 lines and 17 eyes are able to read the N10 line [Table 2]. Table 3 represents the refractive status among subjects. Out of 121 subjects 47 were need correction but only 17 subjects were taken spectacles [Table 4]. Among the subjects, cosmosis was the main barrier to not getting the glasses [Table 5].

Table: 1 present distance visual acuity in both eyes

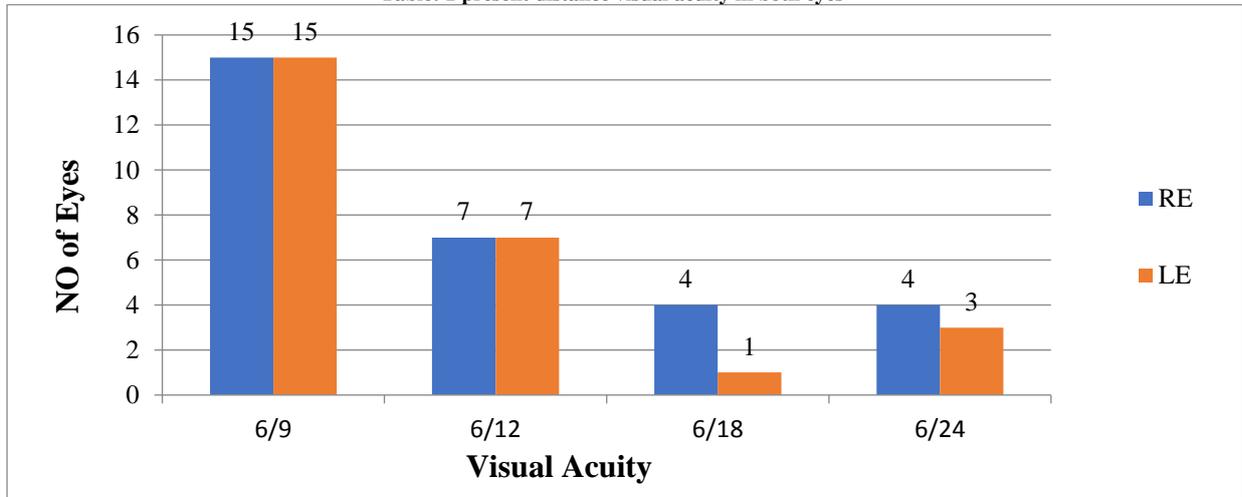


Table: 2 Present near visual acuity in both eyes

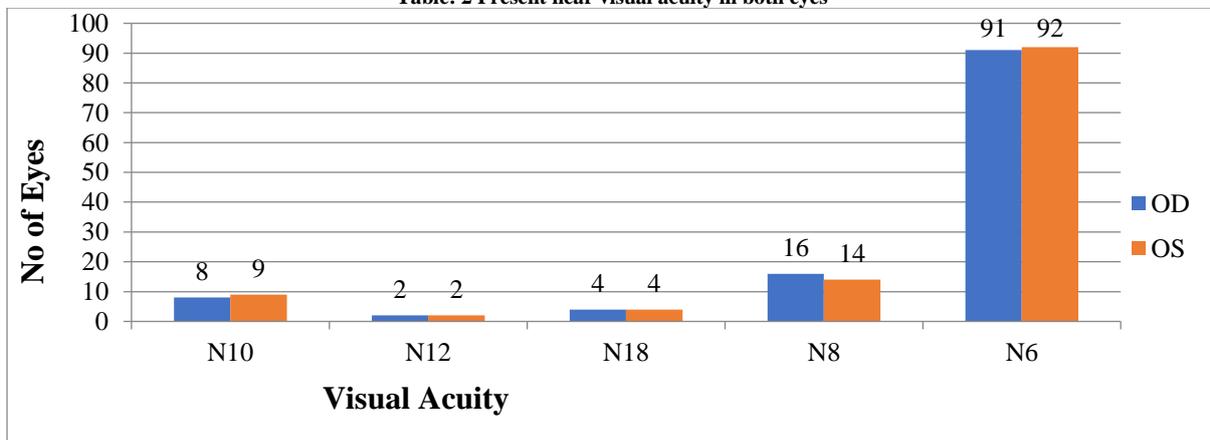


Table: 3 presents refractive status of both eye

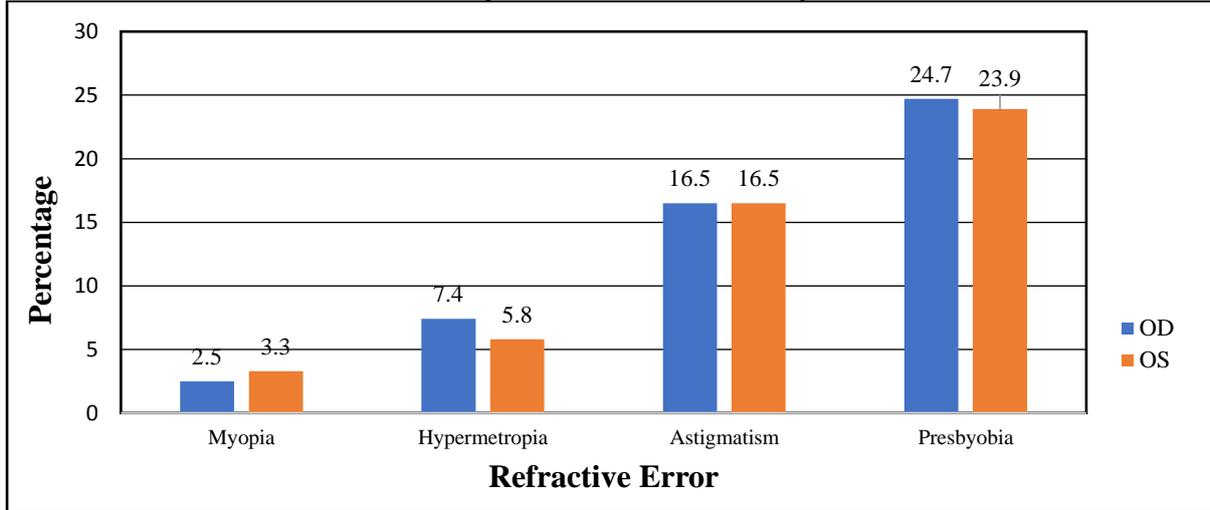


Table: 4 glass prescription and glass dispensed in industrial workers

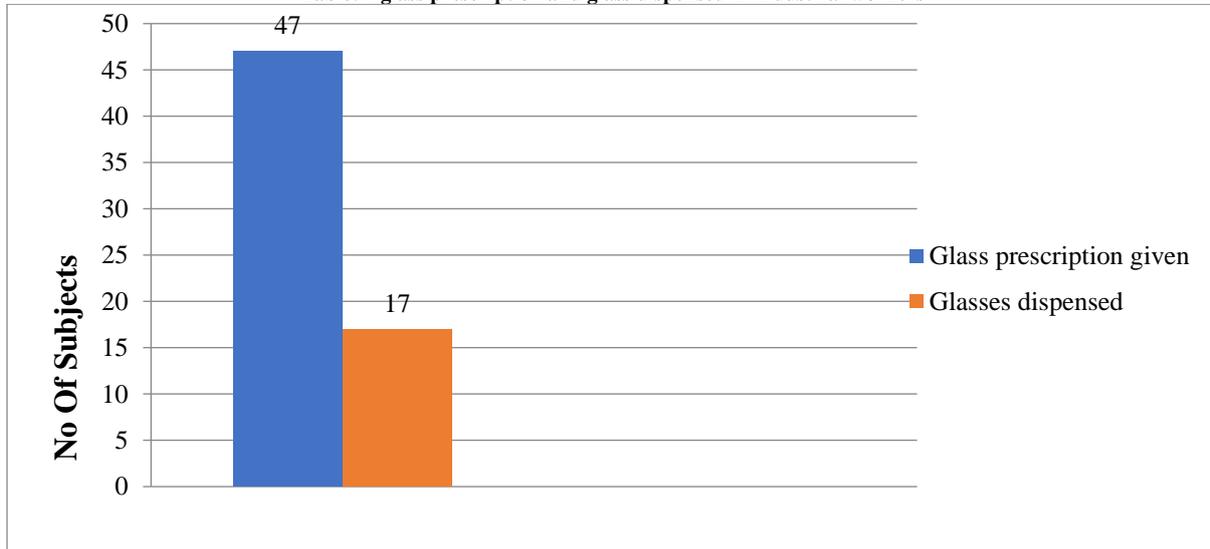
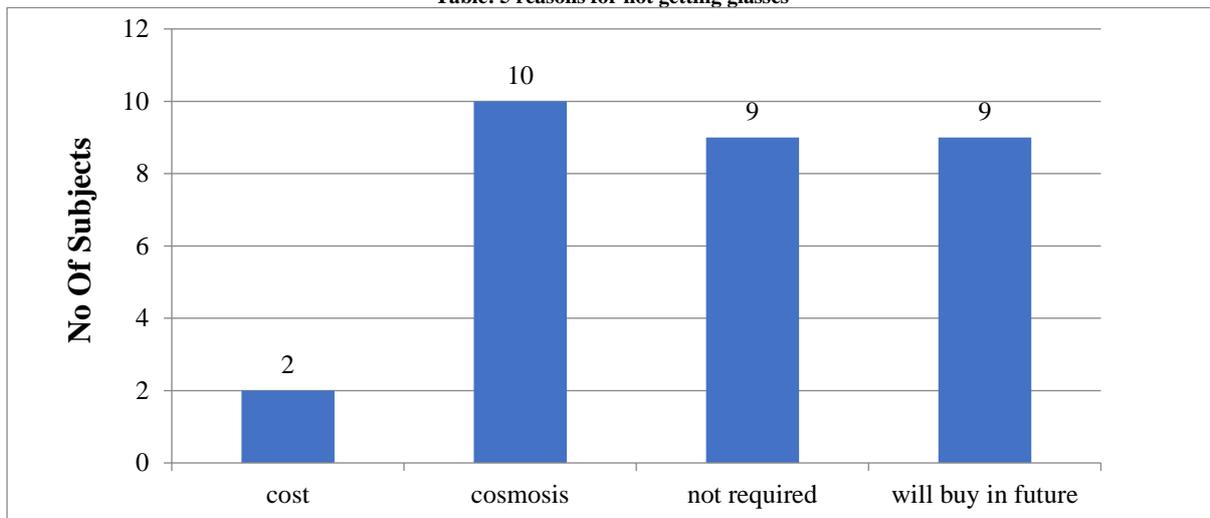
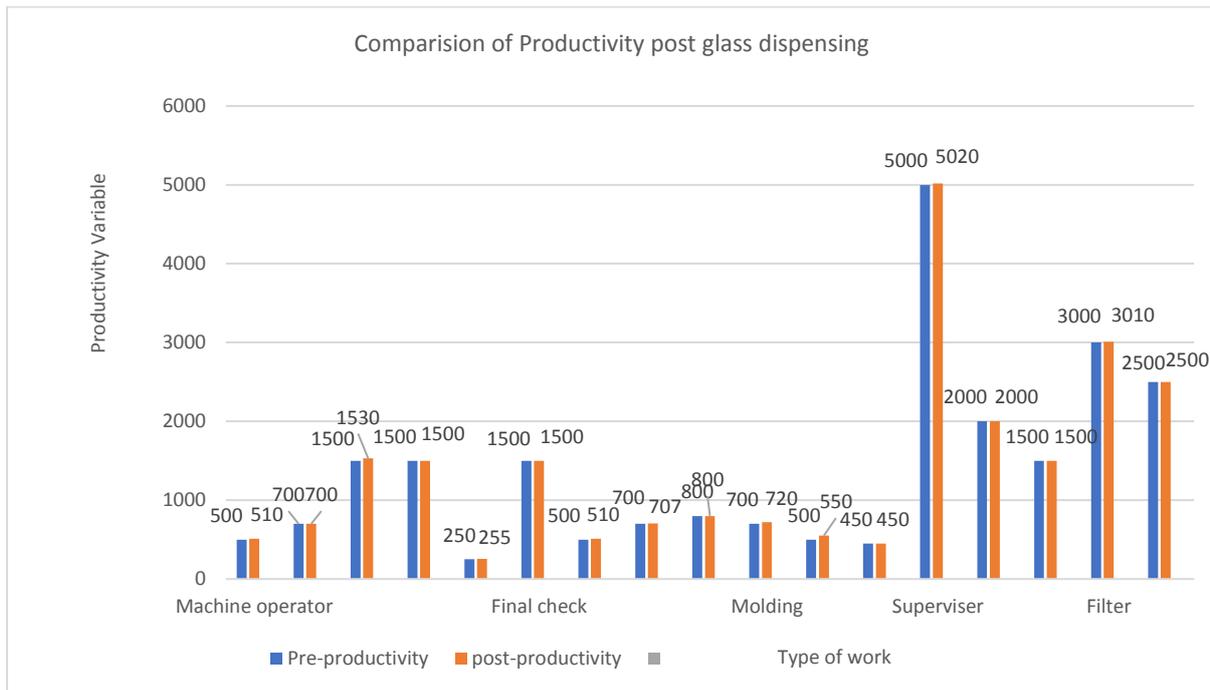


Table: 5 reasons for not getting glasses



**Table: 6 pre- and post-productivity after using glasses**



This table represents the pre and post-productivity of industrial workers. We found that after 3 months of follow-up there is no significant difference between before using the glasses and after using the glasses (Paired T-test,  $p = 0.6163$ ).

**DISCUSSION**

In this study, we found that 38.48% of subjects needed correction but they are not using glasses due to lack of awareness, cosmetic reasons, and also glasses not required or they will buy it in future or sometimes cost factors. Data was shown that astigmatism 16.5 % (OD) and 16.5% (OS) and presbyopia 24.7% (OD) and 23.9% (OS) refractive error were more common and there is no static significant difference in productivity before and after using glasses. A study was found that almost 80% of subjects needed correction but hardly anyone aware of that and there is no significant difference in productivity between those requiring vision correction and those not requiring vision correction<sup>1</sup>. The main barrier to refractive error services in urban areas is lack of awareness 54.5% and economics 53.70%<sup>8</sup>.

**CONCLUSION**

In a nutshell, it is reported that a significantly higher proportion of industry workers have a poor vision of refractive error. But they never try to correct this error unless the vision problem is a major effect on their work and social life. The main barrier to refractive error services maybe it's not a painful problem, cost factor, not necessary in using a foreign object, or cosmetic value.

**Limitation**

Due to less sample size and follow-up this study cannot be carried out further.

**Future Direction**

This study can be done in the future there is the availability of large sample size and also enough follow-up is required.

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**Conflict of Interest:** None

**Source of Funding:** None

**Ethical Approval:** Approved

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