

# Co-relation Between Memory Functions and Vision Impairment Amongst Individuals with Spectacles: A Cross Sectional Study

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## **Abstract:**

**Background:** Vision impairment includes the weakness in the eyesight, not able to recognize distant objects, difficulty in remembering things, troubling reading and writing which affect the ability in making decisions, carry out particular tasks, and their satisfaction with their memory even having the spectacles and also, using them from long duration.

**Aim:** - To correlate the memory impairment in the people having spectacles

**Methods** - A cross sectional study was carried out among 73 individuals of the age group between 18-25 years. This study was done to find out the correlation between the memory impairment in the people using spectacles. The study included individuals having spectacles, power ranging from 0.5 and above. The Individuals having psychological problems and not wearing spectacles on daily basis were excluded from the study. The outcome measure used for the study was Multifactorial memory questionnaire which includes the components of ability, satisfaction, and strategy.

**Result:** - Spearman Correlation Analysis was used for assessing eyesight of the right side and left side with MMQ scale. The results obtained proved to be statistically non- significant. (p-value >0.05).

**Conclusion:** - The study demonstrated that there was no significant correlation between people wearing spectacles and memory in the young population.

**Keywords:** Multifactorial Memory Questionnaire, Memory.

## **Introduction**

Globally, at least 2.2 billion people have near or far vision problems. At least a billion—or nearly half—of these cases could have prevented vision loss or have not yet been treated.<sup>1</sup> These billions include those with moderate to severe farsightedness or blindness due to untreated refractive error (88.4). million). The personal impact of early visual impairment in young children is on motor, language, emotional, social and cognitive development with lifelong consequences. Adults who wear glasses often have lower labor force participation and productivity and higher levels of depression and anxiety<sup>1-4</sup>.

Individuals are capable of enhancing the task with the help of the refractive corrections and accomplish visual tasks with the use of compensatory low vision aids. Individuals with high power spectacles maybe at greater risk for developing mental health problems such as depression and anxiety. Like-wise we have to rule out whether the spectacles can affect the thinking abilities of the individual associated with the satisfaction about this (his/her) own memory skills and the skills related to the decision making and the strategy planning. Some of the studies have shown the result in the relation with the dementia and the

cognitive impairment. Thus this study was taken into consideration that whether there is correlation with the other memory functions like memory ability, strategy and satisfaction<sup>2</sup>

## **METHODS**

All the individual with the age group between 18-24 years wearing spectacles for more than 1 year were selected in the study. A Written informed consent was obtained and the procedure and purpose of the study was explained to the participants. The demographic data of each individual was obtained. The outcome measure Multifactorial Memory Questionnaire was explained in the understandable language to the participants. All the problems that were faced, the ways, need and solutions to overcome the problems was discussed with the participants.

### **Outcome measure:**

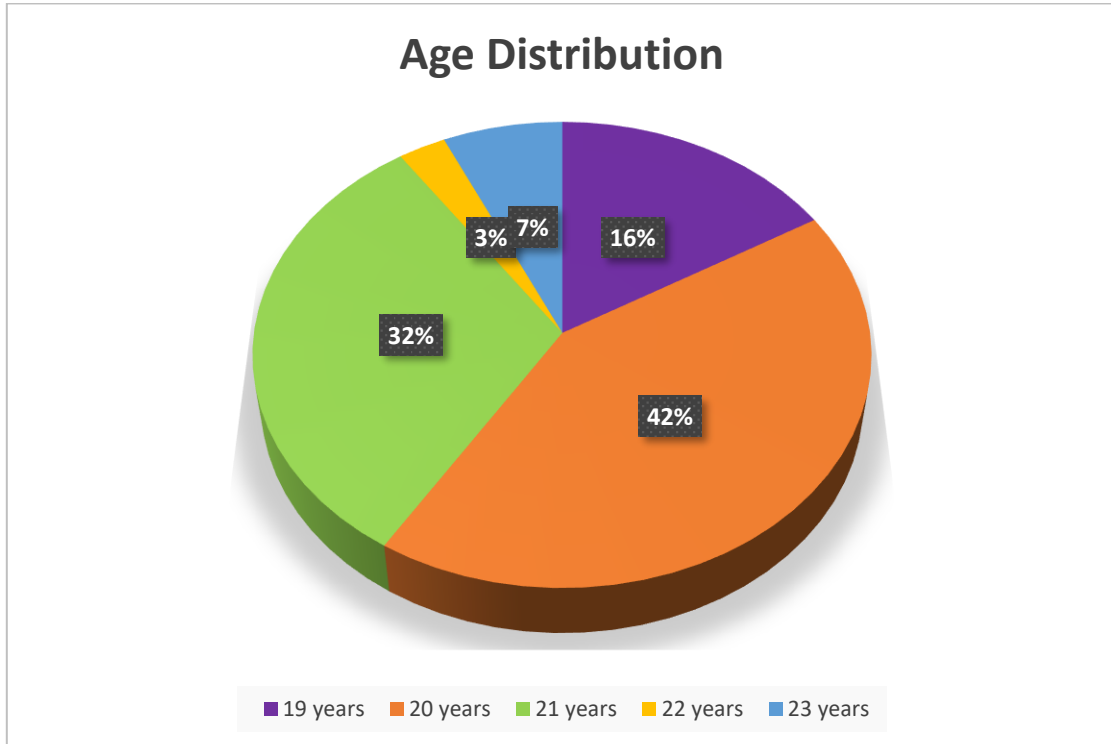
**Multifactorial Memory Questionnaire** :- This single questionnaire includes 3 components. The first component consists of the satisfaction a particular individual is having about his/ her memory. The second component consists of the memory ability and the third component consists of the strategy of the individual. All the individual components were marked according to the scoring of the questionnaire. The reliability and validity of the three different components with the alpha coefficient for satisfaction is 0.95, for Ability 0.93, Strategy 0.84 and validity of 100 %, 92% and 83% respectively.

### **Statistical Analysis:**

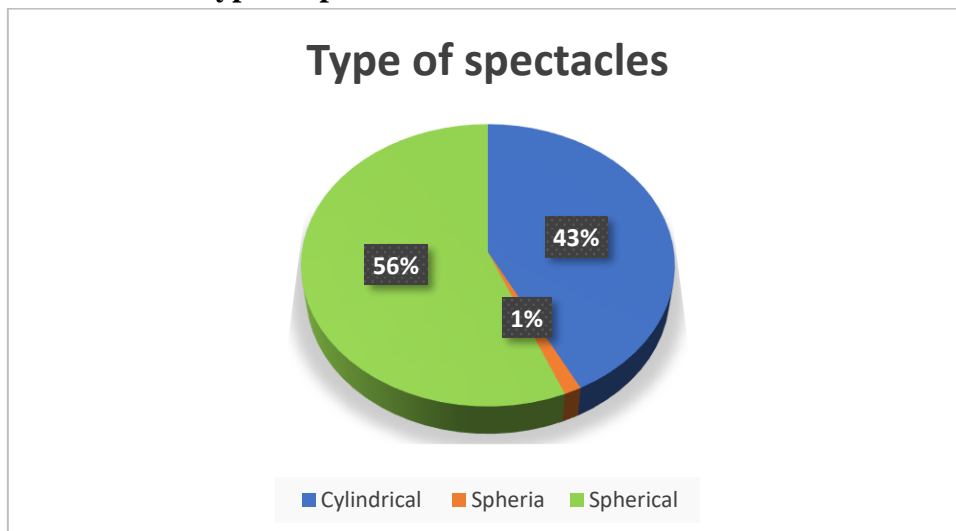
It was taken into consideration that each individual has to respond to all of the questions. The scoring was carried out on the basis of the scoring system according to the questionnaire. The data was statistically analysed with the help of Microsoft excel. The mean and standard deviation were analysed for each individual. The person correlation coefficient was used to determine the relationship. The collected data was statistically analyzed. For each variable the mean and standard deviation were determined. The kolmogrov -Smirnova test was used to determine the relationship.

## **RESULTS**

A total of 73 participants were evaluated in the study. The mean age of total participants was carried out. Normality of variables and the domains of the Multifactorial Memory Questionnaire was analysed using the kolmogovor-Smirnova test. The correlation between the vision and the MMQ score was done by the Spearman Rank Correlation Analysis was set at p-value<0.05.

**Graph No. 1 Distribution of age**

According to the pie chart the age distribution of the individual is given as 42% of age group 20 years, 32 % of 21 year old , age of 19 year with the 16%, 23 year old with the 7% and 3% of age group of 22 year.

**Graph No 2 . distribution of type of spectacles used**

According to the pie chart the percentage of spectacles used by the participants were the spherical type that is about 56%, following that 43% participants were using cylindrical spectacles.

Variable	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	p-value	Statistic	df	p-value
Satisfaction	.391	73	.001	.728	73	.001
Ability	.288	73	.001	.823	73	.001
Strategy	.226	73	.001	.860	73	.001
Right	.100	73	.065	.983	73	.451
Left	.140	73	.001	.969	73	.070

Table 2 : correlation between the vision and the MMQ questionnaire

The above chart showed about the correlation between the spectacles power of the left and the right eye with the variable components of the MMQ questionnaire.

Variable X	Variable Y	r-value	p-value	Result
Eye sight right side	Satisfaction	0.177	0.134	Non-Significant at 5% Linear association
	Ability	-0.047	0.690	Non-Significant at 5% Non-Linear association
	Strategy	0.045	0.704	Non-Significant at 5% Linear association

The correlation association was studied for Eye sight left side and eye sight right side.

Variable X	Variable Y	r-value	p-value	Result
Eye sight left side	Satisfaction	0.128	0.282	Non-Significant at 5% Linear association
	Ability	-0.011	0.925	Non-Significant at 5% Non-Linear association
	Strategy	-0.008	0.945	Non-Significant at 5% Linear association

MMQ scale variables as Satisfaction has been recorded as 0.128, ability has been recorded as -0.011, Correlation coefficient r-value for Eye sight left side and Strategy has been recorded as 0.008 which is statistically non-significant at 5% level with non-linear association.

The result was analyzed using Spearman Correlation Analysis for the eyesight of the right side and left side with MMQ scale which showed statistically non-significant. (p-value >0.05).

**Conclusion:**

The study demonstrated that there was no significant correlation between people wearing spectacles and memory in the young population. As there is no relation between the age factor and the visual acuity of the individual along with the memory functions.

**Discussion:**

In this study we observed that there was no decline in the memory functions in the individuals having vision impairment. Evaluation of the present study have shown the habitual vision status of the younger population. Further-more the participants who were using spectacles for more than 1 year did not experience decline in cognitive functions, further highlighting the importance of preserving good vision among younger people.

It is also important to note that there was little evidence that the relation between vision and either the speed or the cognitive measures varied as a function of age. Because correlations among age, measures of cognitive functioning, and measures of visual functioning have been reported by Clark (1960) and Heron and Chown (1967), the data from those studies were reanalyzed to estimate the amount of age-related variance in their cognitive measures that was shared with the vision measures. The range of health status examined in these studies was likely quite limited compared to the general population because nearly all of the participants in the current studies reported themselves to be in good to excellent health<sup>3-4</sup>

Some of the studies it was found out that those with near vision impairment, and those with far and near vision impairment had high odds of mild cognitive impairment whereas, those with far vision impairment only did not. The result from the following study shown an association between vision impairment and cognitive decline.<sup>2</sup>

In the public health challenge in LMISc was found that there is paucity of human resources for the refraction and optical services, lack of access to refraction services in rural areas, and the cost of spectacles. The methods that can be adopted can be by using self -adjustable glasses.<sup>4-5</sup>

An increase in the cognitive decline is found in the children. The cognitive decline is marked when there is difficulty in performing the functional abilities. The study shown the consistent with an increasing incidence of dementia and other cognitive impairments with age, the total MMSE score was found to decline with age, as found by Crum et al. <sup>3</sup>

**Clinical implication**

Results highlights that there id no effect of vision impairment in the impaired memory function and does not affect the cognitive function of the being.

**Limitations:**

1. Understanding the ability of the individual
2. Great results can be seen on the mid aged or the elderly population.

**References**

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