

The Effect of the Use of Progressive Lens to Presbyopia Comfort in the Optical City of Padang

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Abstract: Glasses are a visual aid. Comfort in using glasses is one of the motives for someone to use optical services. This study aims to examine the effect of the use of progressive lenses on the comfort of novice users in Optical Padang. This type of research is quantitative with the Quasi Experiment approach through the design of the non-equivalent control group. The subject of the study of novice users comforts in using glasses. Data were analyzed using the Wilcoxon Signed Rank Test and Kolmogorov Smirnov 2 Independent Samples with the help of SPSS 20. The research findings show there is a significant effect of the use of progressive lenses on the comfort of beginner users in Optical Padang.

Keywords: *progressive lenses, beginner user comfort*

I. INTRODUCTION

The eye is one of the five senses that is very important for humans. However, often the function as a sense of vision is disrupted due to several factors such as refractive disorders, and accommodation disorders. Refractive disorders are abnormalities in the visual media that cause decreased vision such as myopia, hypermetropia, and astigmatism. While accommodation disorders are caused by an age factor called presbyopia [1]. Refractive disorders and accommodation abnormalities can be corrected with glasses and contact lenses and depending on the level of comfort in using it. Glasses are aids to improve the sharpness of vision with certain lens sizes that are placed in front of the eyes [2].

The use of glasses is strongly influenced by several factors. Research conducted on elementary school students in the United States shows that about 80% of students who are given glasses from their school do not want to use it because they are not comfortable wearing it, as well as presbyopia patients [3].

Here are four factors that cause uncomfortable glasses. 1) Frame section, the glasses frame section consists of several parts. This includes frames and a nose pad. For this part, you must adjust the width of the frame with the face. If the size of the glasses is smaller than the face; then the handle of the glasses can press on the side of the head. This is what causes discomfort, ranging from pain to numbness. The same

discomfort also occurs, when the handle ends behind the ear. Meanwhile, the end of the handle that is too bent can squeeze the bone behind the ear; so that it can cause pain, until the reddish effect. As for the handle of glasses and a heavy lens can also press the nose. Especially if the nose pad (nose rest) is made of hard. As a solution, you can use glasses that fit your face size; it has a per at the end; plastic lenses, and nose pad made from the glue. 2) Lens. In the lens, the term vertex distance is known, as the distance calculated from the rim to the eye. If the ream is too close to the eye, the minus will increase and the plus will decrease. The same thing applies to vice versa. Here, try to keep the vertex distance of 12 mm for Asians and 14 mm for non-Asians. 3) Congenital diseases. One of the factors causing discomfort in glasses, namely congenital diseases in humans. This includes squinting eyes, both phoria eye and tropia. Besides, irritation and inflammation in the eye will also make its users feel uncomfortable. 4) Wrong Glasses Prescription. In general, a person takes about seven days or more to adapt to his new glasses. However, if someone takes more time than that and continues to feel dizzy; prescription glasses may be inaccurate.

One type of lens that can correct presbyopia is a progressive lens. This lens has a sturdy construction and most memorable in terms of cosmetics. Also, this lens is assumed to provide comfort to the wearer [4].

II. MATERIAL AND METHOD

The experimental design used in this study was the experimental design of the Quasi Experiment model, with the research design of The Non-Equivalent Control Group, this design consisted of two groups namely the experimental group and the control group. This research was conducted in the optics city of Padang.

The subjects in this study were 40 patients. The instrument used in this study is a Likert scale. The data analysis technique uses nonparametric statistics with the Wilcoxon Singed Rank Test. The description of the data is done through data analysis based on the results of the hypothesis test using SPSS version 20.00.

III. RESULTS

Data Description

The data obtained were then analyzed, the analytical techniques classified as very convenient, comfortable, quiet comfortable, uncomfortable and very uncomfortable. The categorization is as follows:

Table 1. Level of Comfort for Progressive Lens Users

No	Category	Range
1	Very comfortable	≥ 238
2	Comfortable	191-237
3	Comfortable enough	144-190
4	Uncomfortable	97-143
5	Very uncomfortable	≤ 96

Hypothesis testing

Testing this hypothesis is also used the Kolmogorov Smirnov 2 Independent test technique. This hypothesis tested was "There is a difference in the comfort level of the experimental group patients who use progressive lenses with control group patients without using progressive lenses.

Table 2. Analysis Results of the Kolmogorov Smirnov 2

Comfortable		Score
Most Extreme Differences	Absolute	.800
	Positive	.000
	Negative	.000
Kolmogorov-Smirnov Z		1.789
Asymp. Sig. (2-tailed)		.003

Based on the data in the table above, it can be seen that the user's comfort in the Asymp column. Sig. (2-tailed) / significances for the two-tailed test are 0.003 which with another form (0.003 < 0.05). Then H0 is rejected and Ha has accepted the meaning, "there is a significant difference in the comfort level of the experimental group patients using progressive lenses with control group patients without using progressive lenses.

IV. DISCUSSION

Discomfort when using new glasses, and deemed incompatible with the results of previous corrections, generally can cause complaints can be blurred vision, shaking, headaches, pain around the eyes, eyes feel tired, and watery eyes [2]. This can be caused by several things including:

Frame factor: As the frame size is too small, too heavy, the shape of the handle that is too bent, so that it can press the back of the ear, and generally will be a disturbance in

peripheral vision when first changing the eyeglass frame model.

Lens factor: Like excessive or less than correct eye correction, this is due to many things such as when the correction of the eye condition is checked, and the time when taking glasses that are too long to have changed the correction, the difference in lens strength between the right and left eye too large can also cause discomfort, placing a cylindrical axis that is not appropriate, and the replacement of new lens types, where the refractive index sometimes changes slightly causing discomfort at the beginning.

User factors: As for wearers of glasses with a tropia / phoria eye condition, the shape of the face is not adjusted to the glasses, so the glasses often sag and change the distance between the lens of the eye to the cornea (vertex distance) and psychological disorders [5]

A progressive lens is a multi-focus lens that has more than one lens focal point [6]. When someone sees an object with a medium or medium distance, such as the distance of vision on a computer, the vision will adjust to the clearest focus point [4]

Progressive lenses provide increased strength including 1) for all long, medium and close distances. 2) Accommodation is more natural, so there is no need for fluctuations when seeing. 3) progressive lenses do not have a jump image. 4) progressive lenses look like a single vision. Since it was introduced by Essilor in 1959, progressive lenses have been accepted worldwide as the most performing eye lenses for presbyopia correction because they provide comfortable vision at all distances [3]. The use of progressive lenses is suitable for people who have presbyopia which is the age range > 40 years. Additionally, progressive lenses provide comfort to its users [7] [8].

V. CONCLUSION

Based on the results of the research that has been obtained, it can be concluded: 1) the patient's comfort in using a progressive lens; 2) the use of progressive lenses provide very comfortable in overcoming/correcting refractive abnormalities and weaknesses of accommodation compared to other lenses.

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