

COMPARISON OF USER COMFORT AND VISIBILITY OF CONTACT LENSES AND GLASSES AT GEMBULGLASSES YOGYAKARTA

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ABSTRACT

Contact lenses are widely chosen for their practicality and appearance enhancement, while eyeglasses are easier to use and maintain. Both comfort and visibility are influenced by various factors, such as the accuracy of refractive correction, eye condition, duration of use, device cleanliness, and user activity. Therefore, the choice of visual aids needs to be tailored to the needs and conditions of each user. Objective 1) To identify the comfort levels of contact lens and eyeglass users, 2) To identify the visibility levels of contact lens and eyeglass users, 3) To analyze the differences in comfort and visibility between contact lens and eyeglass users. This study used a quantitative method with a comparative analytical design and a cross-sectional approach. The study population was contact lens and eyeglass users at GembulGlasses Yogyakarta. A sample of 68 respondents, consisting of 34 contact lens users and 34 eyeglass users, was selected using a purposive sampling technique. Data were collected using a questionnaire and analyzed univariately and bivariate using Independent Sample t-tests. The comfort level of eyeglass users was higher than that of contact lens users, with 82.4% and 41.2% categorizing them as comfortable, respectively. The visibility level of eyeglass users was also better, with 88.2% categorizing them as good, compared to 44.1% for contact lens users. The Independent Sample t-test results showed a significant difference in comfort level ($p = 0.001$) and visibility ($p = 0.001$) between contact lens users and eyeglass users. There was a significant difference in comfort and visibility levels between contact lens users and eyeglass users. Eyeglass users reported better comfort and visibility levels than contact lens users among respondents at GembulGlasses Yogyakarta.

Keywords: Comfort, Visibility, Contact Lenses, Glasses.

INTRODUCTION

The eye is a sensory organ that plays a crucial role in human life, as it receives light stimuli and transmits them to the brain as visual information. Through vision, a person can perform various activities such as studying, working, driving, interacting socially, and carrying out daily activities optimally (Johan B. Bension et al., 2024). Therefore, eye health and vision quality are crucial aspects in supporting a person's productivity and quality of life. Impaired vision can reduce an individual's ability to carry out activities and impact physical, psychological, and social aspects.

One of the most common eye health problems is refractive errors. Refractive errors occur when light entering the eye is not focused properly on the retina, resulting in blurred vision. Common types of refractive errors include myopia (nearsightedness), hyperopia (farsightedness), astigmatism, and presbyopia (Jusmawati et al., 2024). According to the World Health Organization (WHO), uncorrected refractive errors are one of the leading causes of visual impairment worldwide. It is estimated that more than 2.2 billion people experience visual impairment globally, and most of these cases can be prevented or treated with appropriate refractive correction. In Indonesia, refractive errors are also a relatively high prevalence of eye health problems, especially among school-age groups, university students, and those of productive age who have high visual activity intensity. This condition has led to an increasing public demand for visual aids such as glasses and contact lenses as a means of vision correction.

Glasses are the most common visual aid used to correct refractive errors. They work by refracting light through the lens so that the image falls directly on the retina (Chin, 2020). Wearing glasses tends to be easy, safe, practical, and does not require direct contact with the eye surface. Furthermore, glasses are available in a variety of lens types and frame styles to suit the wearer's needs. However, glasses also have several limitations, such as easily fogging, being exposed to light reflections, interfering with exercise, and having a narrower field of view due to the lens frame.

On the other hand, contact lenses are an alternative visual aid that is increasingly popular. Contact lenses are worn directly on the surface of the cornea, following eye movements and providing a wider field of vision (Fakhrudin et al., 2025). As optical technology advances, contact lens materials and designs continue to evolve, providing greater comfort than previous generations. Contact lens use is increasing, especially among adolescents and young adults, as they are considered more practical, aesthetically pleasing, and can enhance appearance. In many cases, contact lenses are used not only as a refractive correction tool but also as part of a lifestyle and cosmetic necessity (Pratiwi, 2023).

Despite their numerous advantages, contact lens use also carries risks that require consideration. Prolonged contact lens wear, poor hygiene, the use of inappropriate cleaning solutions, and sleeping with contact lenses in can lead to various complaints, including dry eyes, irritation, a foreign body sensation, red eyes, and corneal infections such as keratitis. These conditions can reduce wearing comfort and potentially harm eye health if not properly managed (Ichsan, 2022). Therefore, contact lens selection should consider safety, hygiene, and suitability for the wearer's eye condition.

When choosing a visual aid, comfort is a crucial factor, influenced by its weight, size, lens material, duration of use, environment, and user activity. Contact lenses are generally more comfortable for active activities, while glasses are more practical because they are easy to put on and take off. Furthermore, visibility is also a key aspect, as it relates to clarity, sharpness, stability, and field of view. Contact lenses tend to provide a wider field of view, while glasses can experience issues such as fogging, light reflections, and frame limitations. The growing use of digital devices further emphasizes the importance of this research, as prolonged screen use can cause eye fatigue, dry eyes, and temporary blurred vision in both contact lens and glasses users.

Several previous studies have shown differences in user experience between contact lenses and glasses. Research by Mehtap Arslantürk Eren et al. (2025) showed that contact lenses with advanced surface moisturizing technology can provide better comfort at the end of the day and reduce dry eyes, eye fatigue, and blurred vision in digital platform users (Arslantürk Eren et al., 2026). Research by Lee CY et al. (2025) showed that dual-focus contact lenses and DIMS glasses are equally effective in controlling myopia, although there are differences in effectiveness in certain parameters (Lee et al., 2025). Meanwhile, research by Rosmerri Simanjuntak et al. (2025) stated that soft contact lens materials affect the level of user comfort, especially in terms of water content, oxygen conductivity, and the ability to maintain eye moisture (Rosmerri Simanjuntak, 2025).

However, research directly comparing user comfort and visibility between contact lenses and glasses is still relatively limited, particularly in the context of users in the Yogyakarta area. Each region has different societal characteristics, lifestyles, environmental conditions, and consumer preferences, so research results from other regions may not fully reflect local conditions. GembulGlasses Yogyakarta, as an optical service provider, has consumers with diverse age backgrounds and visual needs, making it a relevant location for this research.

The urgency of this research lies in the increasing use of contact lenses, especially

among young people, without adequate understanding of their impact on comfort and quality of vision. Many users choose visual aids based on trends, aesthetics, or price without considering eye health factors. If this situation persists, the risk of eye complaints, discomfort, and inappropriate use of contact lenses may increase.

Based on the description, it is necessary to conduct a study on the comparison of user comfort and visibility of contact lenses and glasses at GembulGlasses Yogyakarta . This study is expected to provide an empirical description of the advantages and disadvantages of each visual aid based on direct user experience. In addition, the results of the study can be used as a consideration for the public in choosing appropriate visual aids, as well as input for optical practitioners in improving services and education to consumers. The novelty of this study lies in the comparative approach of two visual aids by assessing two main variables simultaneously, namely comfort and visibility, in a real user population in the local optical environment of Yogyakarta.

This study aims to compare comfort and visibility between contact lens and eyeglass wearers . Specifically, the study was conducted to identify comfort levels, measure visibility levels, and analyze differences in comfort and visibility between contact lens and eyeglass wearers.

Theoretically, this research is expected to broaden the field of optics regarding the comparison of comfort and visibility between contact lenses and glasses, and serve as a reference for further research. Practically, for GembulGlasses Yogyakarta, the research results can be used as input in improving services and providing product recommendations according to consumer needs. For consumers, this research provides information on the advantages and disadvantages of contact lenses and glasses, thus helping them determine their choice of visual aids. For researchers , this research can broaden their experience, insight, and ability to conduct scientific research in the field of optics and eye health.

This study compared the comfort and visibility of contact lens and eyeglass wearers . Contact lenses provide a wider field of vision and are unobstructed by frames, but require proper care to prevent irritation and infection. Glasses are more practical and safer because they don't come into direct contact with the eye, but they have limitations such as frames, fogging, and light reflections.

Contact lenses are visual aids placed directly on the cornea to correct refractive errors. They offer the advantage of a wider field of vision, unobstructed by frames, unlike glasses (Rosmerry Simanjuntak, 2025). Furthermore, they offer high aesthetic value, making them popular among teenagers and students. Users feel more confident because they are not seen wearing visual aids. This makes contact lenses a part of the modern lifestyle (Pratiwi, 2023). However, contact lens use also carries health risks, especially if not used correctly. These risks include irritation, dry eyes, and corneal infections. Unhygienic use can worsen eye conditions and lead to serious complications (Muhammad et al., 2023).

Comfort can be defined as a situation where a person experiences a sense of comfort and well-being mentally, physically, and socially. In the context of health, comfort encompasses physical, emotional, social, and spiritual dimensions that influence an individual's perception of their environment and experiences (Fauziah et al., 2025). Comfort is influenced by dry eyes, irritation, ease of use, and activity. Meanwhile, visibility is influenced by visual acuity, field of view, stability, light interference, and blurring.

Comfort variables are measured using several indicators, namely dry eye, irritation, ease of use, and activity. Dry eye indicates the level of eye moisture when using a visual aid. Irritation describes itching, burning, or discomfort in the eyes. Ease of use indicates how practical the visual aid is to use and maintain. Activity describes the user's comfort during daily activities, such as working, studying, exercising, or driving. The better the

conditions in these indicators, the higher the user's comfort level (Kaur et al., 2022).

In the field of optics, visibility is closely related to the quality of the visual system and the optical instruments that aid the seeing process. According to (Muhammad et al., 2023) Optical instruments are tools that utilize the properties of light, the laws of reflection, and refraction of light to aid in examinations and clarify vision. Several optical instruments, such as trial lenses, trial frames, Snellen optotypes, autorefractometers, and ophthalmoscopes, are used to assess eye condition and the quality of a person's vision. This demonstrates that visibility is closely related to the eye's ability to receive and focus light optimally.

Visibility variables are measured using several indicators, namely sharpness, field of view, stability, light interference, and blur. Sharpness indicates the user's ability to see objects clearly and in detail. Field of view describes the extent of the visual area that can be seen without obstruction. Stability indicates the consistency of visual clarity during movement or activity. Light interference describes the presence of glare, reflections, or sensitivity to light that interfere with vision. Blur indicates the level of visual disturbance in the form of objects appearing out of focus or blurry. The better the conditions in these indicators, the higher the user's level of visibility (Susanti, 2022).

RESEARCH METHODS

Study This is study quantitative with design analytic comparative use approach cross-sectional, namely measurement variables done on One time. Design This chosen Because capable give description difference performance between method in a way objective without do intervention to variables studied. Design comparative allows researchers For identify differences in user comfort and visibility between contact lenses and glasses at GembulGlasses Yogyakarta.

The research was conducted at GembulGlasses Yogyakarta, an optical shop with a significant number of users. This location was chosen because it facilitated the acquisition of relevant respondents. The research was conducted in June 2026, according to a predetermined schedule.

The sample was contact lens and eyeglass users at GembulGlasses Yogyakarta, with a total of approximately 200 consumers per month. The sample was selected using a purposive sampling technique based on certain criteria. Respondents must be at least 17 years old, use contact lenses or glasses, and be willing to fill out the questionnaire. Respondents who did not complete the questionnaire completely or were unable to communicate well were not included in the sample. Based on calculations using the Slovin formula, 68 respondents were obtained, consisting of 34 contact lens users and 34 eyeglass users.

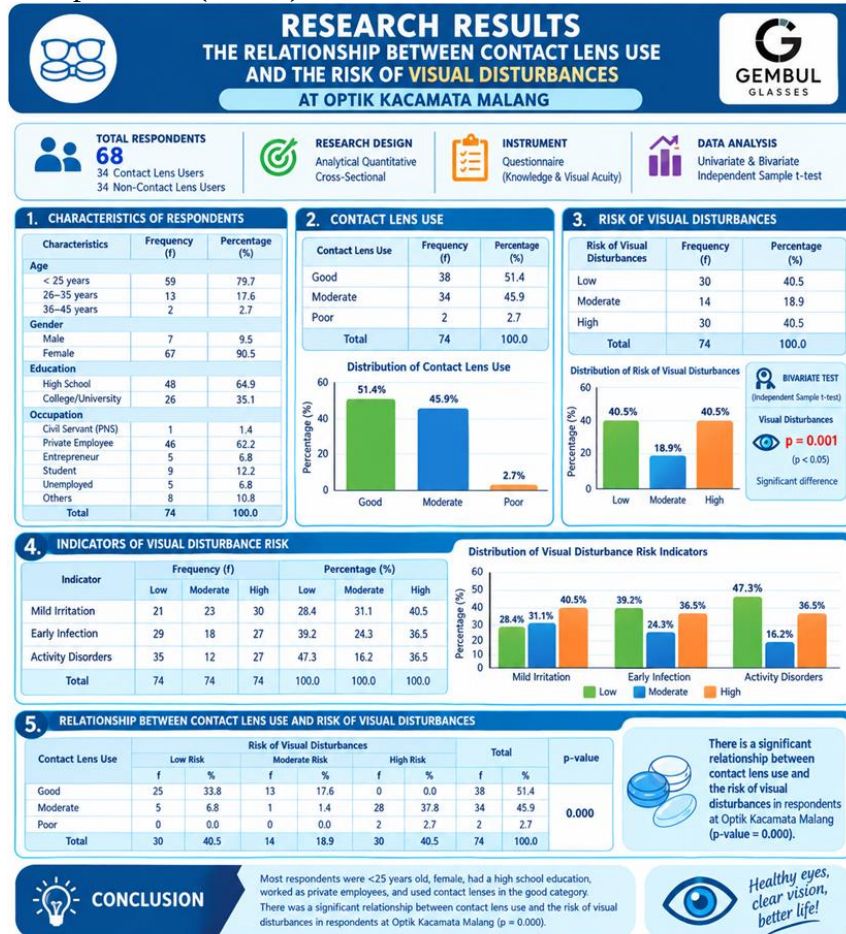
The independent variables in this study were the visual aids used, namely contact lenses and glasses. The dependent variables included user comfort, which encompassed comfort during use, ease of use, and user satisfaction. Visibility encompassed clarity of vision, field of view, and ease of seeing in various conditions.

Univariate analysis was used to describe the research data through the mean, median, and standard deviation values of processing time for each dispensing method. Bivariate analysis was used to determine the difference in time efficiency between the manual and semi-automatic methods. If the data was normally distributed, the Independent T-Test was used, while if it was not normally distributed, the Mann-Whitney test was used. Results were declared significant if the p-value <0.05.

RESULTS AND DISCUSSION

This study involved 68 respondents, most of whom were in the 17–25 age group,

namely 39 respondents (57.4%), followed by 26–35 year olds (38.2%), and 36–45 year olds (4.4%). Based on gender, the majority of respondents were women. 37 respondents (54.4%) were female, while 31 respondents (45.6%) were male. In terms of occupation, the majority of respondents were private sector employees (28 respondents (41.2%)), followed by self-employed (19 respondents (27.9%)).



Based on the duration of contact lens use per day, the majority of respondents used contact lenses for more than 8 hours as many as 33 respondents (48.5%), followed by the use of 4–8 hours as many as 26 respondents (38.2%) and less than 4 hours as many as 9 respondents (13.2%). Based on the duration of contact lens use, the majority of respondents had used contact lenses for more than 3 years, namely 27 respondents (39.7%), followed by less than 1 year as many as 23 respondents (33.8%) and 1–3 years as many as 18 respondents (26.5%).

Based on complaints during contact lens use, the most common complaint was tired eyes with 28 respondents (41.2%), followed by dry eyes with 12 respondents (17.6%), no complaints with 11 respondents (16.2%), blurred vision with 10 respondents (14.7%), dizziness with 6 respondents (8.8%), and other complaints with 1 respondent (1.5%). These results indicate that respondents were predominantly young adults, women, and private employees, with contact lens use of more than 8 hours per day and the most common complaint felt was tired eyes.

Research at GembulGlasses shows that most eyeglass wearers report a higher level of comfort than contact lens wearers. This is evident in the fact that the majority of eyeglass wearers (82.4%) are comfortable, compared to only 41.2% of contact lens wearers. Furthermore, some contact lens wearers report discomfort (26.5%) and very discomfort

(5.9%).

According to the theory of ergonomics and eye health, the comfort of using visual aids is a condition when the user can use the aid for a certain time without causing complaints such as dry eyes, irritation, a feeling of obstruction, pain, or eye fatigue (Butar, 2026). The level of comfort is influenced by several factors, including the suitability of the aid to the eye condition, the quality of the lens material, the duration of use, cleanliness, and the environment of use (Ferywidyastuti et al., 2025). In contact lenses, comfort is greatly influenced by water content, oxygen transmission ability (oxygen transmissibility), and tear film stability, while in glasses, comfort is more influenced by the suitability of the frame size, the weight of the glasses, and the accuracy of lens correction (Fauziah et al., 2022).

The higher level of comfort among eyeglass wearers is thought to be due to the fact that glasses do not come into direct contact with the eye surface, thus lowering the risk of dry eyes, irritation, or a feeling of obstruction. Conversely, the comfort of contact lens wear is influenced by the duration of wear, lens cleanliness, environmental conditions, and user compliance with care procedures. These results align with research by Mehtap Arslantürk Eren et al. (2025) which states that innovative contact lens moisturizing technology can improve user comfort, but daily wear factors still play a significant role in eye comfort. Meanwhile, eyeglass wearers tend to feel more comfortable for long-term use because they do not come into direct contact with the eye surface and are easier to care for. However, some respondents felt that wearing glasses was less practical for certain activities such as sports or in the rain because they can fog up and shift easily.

The results of the study showed that the visibility level of eyeglass users was better than that of contact lens users. As many as 88.2% of eyeglass users were in the good visibility category, while only 44.1% of contact lens users were. In addition, there were still contact lens users who experienced poor (17.6%) and very poor (11.8%) visibility. According to the theory, visibility or quality of vision is the eye's ability to see objects clearly, sharply, and with contrast after light is focused precisely on the retina. The quality of visibility is influenced by the accuracy of refractive error correction, the condition of the eye's refractive media, the quality of the visual aid used, and the condition of the ocular surface. Visual aids that are able to provide optimal refractive correction will result in better visual acuity and increase visual comfort.

These differences can be influenced by various factors, such as the accuracy of refractive correction, lens condition, compliance, and ocular surface health. In contact lens users, dry eyes, lens deposits, or prolonged use can reduce vision quality. Research by Lee CY et al. (2025) also shows that there are differences in visual performance between contact lenses and glasses under certain conditions, so that the effectiveness of each visual aid is influenced by the characteristics of the user and the type of correction used.

The results of the Independent Sample t-test showed that there were significant differences in comfort levels ($p = 0.001$) and visibility ($p = 0.001$) between contact lens users and glasses users. The average comfort and visibility scores for glasses users were higher than for contact lens users, so in this study, glasses provided a better wearing experience.

These differences are thought to be influenced by the characteristics of the two visual aids. Glasses do not come into direct contact with the eye, making them easier to wear, requiring less maintenance, and carrying a lower risk of irritation. Conversely, comfort and quality of vision in contact lens wearers are influenced by various factors, such as the type of lens material, oxygen transmission capacity, lens moisture content, duration of wear, and adherence to lens hygiene and care.

This finding is supported by research by Rosmerry Simanjuntak et al. (2025) which

states that the comfort of using contact lenses is greatly influenced by the characteristics of the lens material, oxygen transmission capacity, water content, and user compliance in caring for the lenses. Meanwhile, glasses have the advantage of being easier to use, safer for the eye surface, and require simpler maintenance (Rosmerry Simanjuntak, 2025). Thus, it can be concluded that there is no visual aid that is completely superior in all aspects. The level of comfort and visibility is greatly influenced by the condition of the eyes, activities, and preferences of each user. Therefore, the choice between lenses and glasses needs to be adjusted to the individual needs of the user.

CONCLUSION

This study has achieved the objective of comparing the comfort and visibility of contact lens and eyeglass users. The results showed that the comfort level of eyeglass users was higher than that of contact lens users, with a significant difference ($p = 0.001$). The visibility level of eyeglass users was also better than that of contact lens users, with the results showing a significant difference ($p = 0.001$). This condition indicates that eyeglasses provide a better user experience for respondents at GembulGlasses. The results of this study can be used as evaluation material for opticians in providing recommendations for visual aids that suit consumer needs. In addition, this study can contribute to the field of optometry, especially regarding the comparison of comfort and visibility between contact lenses and eyeglasses. Therefore, the selection of visual aids needs to be adjusted to the needs, comfort, and conditions of the user.

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