World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(RESEARCH ARTICLE)

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Knowledge and practices of eyeglass care among spectacle wearers in a semi-urban Nigerian community

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World Journal of Advanced Research and Reviews, 2026, 30(02), 2345-2354

Publication history: Received on 16 April 2026; revised on 25 May 2026; accepted on 27 May 2026

Article DOI: https://doi.org/10.30574/wjarr.2026.30.2.1479

Abstract

Proper eyeglass care is essential for maintaining lens clarity, preserving frame quality, improving visual comfort and prolonging the lifespan of spectacles. However, many spectacle wearers demonstrate inadequate knowledge and poor maintenance practices, particularly in semi-urban communities where access to eye care education may be limited. This study assessed the knowledge and practices of eyeglass care among spectacle wearers in Mpama community, Egbu, Owerri North, Imo State. A descriptive cross-sectional study was conducted among 250 spectacle wearers aged 18–50 years residing in Mpama community. Participants were selected using stratified random sampling from households, eye clinics, and optical dispensing centres. Data were collected using a structured questionnaire and an observation checklist, and were analyzed using SPSS version 26. Descriptive statistics were presented as frequencies and percentages, while associations between variables were tested using chi-square at a significance level of $p<0.05$. More than half (55.6%) of respondents demonstrated poor knowledge of eyeglass care. Similarly, 62.4% of respondents exhibited poor eyeglass care practices. Educational level and occupation were significantly associated with eyeglass care practices ($p<0.05$), whereas age and sex showed no significant association. Key factors influencing eyeglass care practices included lack of knowledge, cost of cleaning materials, educational status, and professional counseling from eye care practitioners. Knowledge and practices of eyeglass care among spectacle wearers in Mpama community were generally poor. There is a need for intensified patient education, regular counseling by eye care professionals, and community-based eye health promotion programs to improve proper spectacle maintenance and enhance visual comfort among spectacle users.

Keywords: Eyeglasses Care; Spectacle Wearers; Knowledge; Practice; Imo State; Nigeria

1. Introduction

Vision is one of the most important senses required for effective daily functioning. Uncorrected refractive errors (such as myopia, hyperopia, astigmatism, and presbyopia) remain one of the leading causes of visual impairment globally[1]. Spectacles remain the safest, cheapest, and most widely accepted means of correcting refractive errors. Nevertheless, the maximum benefit from spectacle wear does not only depend on suitable prescription but also on proper care and maintenance. Despite the widespread use of spectacles, many wearers lack adequate knowledge regarding proper eyeglass care. Eyeglasses require adequate care to maintain lens clarity, prevent scratches, preserve frame alignment, and reduce the risk of ocular irritation or infection. Proper eyeglass care includes cleaning lenses with appropriate materials like microfiber cloths, using lens cleaning solutions, storing spectacles in protective cases, avoiding placement

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of lenses face down, using both hands while wearing or removing spectacles and attending regular eye examinations2,3. Poor maintenance practices may reduce the lifespan of spectacles and compromise visual comfort. The frame gets dirty from sweat and everyday dirt. A greasy finger print, smudge, debris, dust or moisture can affect the quality of vision through the spectacles4. Many spectacle users possess inadequate knowledge regarding spectacle maintenance. A study among regular spectacle users reported that awareness about proper care and maintenance strategies was generally poor4,5. In Ethiopia, Desalegn et al. reported gaps in knowledge and practice regarding spectacle use, particularly among individuals with lower levels of education6. Similar knowledge-attitude-practice (KAP) patterns have been documented in African populations, where educational attainment significantly influences spectacle-related behaviours7.

Studies have shown that many spectacle users adopt inappropriate cleaning methods, including the use of clothing materials and tissue paper, which may result in lens scratches and reduced optical clarity4,5. It was also reported that, while many respondents cleaned their glasses regularly, improper cleaning and handling methods were common4. Factors influencing eyeglass care practices include educational level, access to eye care services, duration of spectacle use, counselling by eye care professionals. Studies reported that individuals who received proper instructions from Opticians demonstrated better maintenance practices4,5. A Nigerian study on barriers to spectacle utilization highlighted the importance of patient education in improving spectacle use and maintenance practices8. In Nigeria, previous researches have greatly focused on refractive error prevalence and barriers to spectacle utilization rather than maintenance practices8›9. In semi-urban communities in Nigeria, access to eye care information and professional counseling may be limited, thereby affecting proper spectacle maintenance practices. Poor spectacle care may lower durability, increase replacement costs, jeopardize visual comfort, and reduce compliance with spectacle use. Therefore, assessing the knowledge and practices of eyeglass care among spectacle wearers is important for planning effective eye health education interventions.

Objectives of the Study

- General Objective

To assess the knowledge and practices of eyeglass care among spectacle wearers in a semi-urban community in Imo State.

- Specific Objectives
- To determine the level of knowledge of eyeglass care among spectacle wearers in Mama community, Egbo, Owerri, Imo state.
- To assess the practices of eyeglass care among spectacle wearers in Mama community, Egbo, Owerri, Imo state.
- To identify factors influencing eyeglass care practices among spectacle wearers in Mama community, Egbo, Owerri, Imo state.
- To determine the association between socio-demographic characteristics and eyeglass care practices among spectacle wearers in Mama community, Egbo, Owerri, Imo state.

2. Materials And Methods

2.1. Study Design

A descriptive cross-sectional study was adopted for this study.

2.2. Study Area

This study was conducted in Mpama, which is a village in Egbu Autonomous Community in Owerri north LGA, Imo state, Nigeria, located near Owerri city. The community is predominantly middle-class with residents engaged in farming, trading and civil service. There are several eye clinics located in and around Egbu, Owerri, Imo state. Eye care services in the area include St CecilliaQueens Eyecare Ltd., CharisTouch Eyecare centre, Silverspring Eye clinic and Optical Dispensary, Vision Matrix Eye clinic, Assumpta Eye clinic, Imo state university Optometry Eye clinic, Jumay Eyecare Centre, Lumi Eye clinic.

2.3. Study Population

The study population comprised spectacle wearers aged 18-50 years who had used spectacles for at least one year and resided in Mpama community.

2.4. Sample Size and Sampling Technique

The sample size for this study was calculated using the prevalence estimate approach. Since local data on spectacle use in Mpama, Egbu, Owerri north were limited, a prevalence of 20% was adopted based on evidence from similar Nigerian populations, where spectacle use among adults was reported to be low, ranging from approximately 3% to 17%10, 11. Using this estimate of 20% (0.2), a 95% confidence interval (Z=1.96), and a 5% margin of error (d=0.05), the minimum required sample size was calculated using the formular;

$$n = \frac{Z^2 . P . (1-P)}{d^2}$$

$$n = \frac{(1.96)2 \times 0.2 \times (1- 0.2)}{(0.05)2}$$

$$n = 3.8416 \times 0.16 = 0.6146 = 245.84$$

$$0.0025 \qquad 0.0025$$

To account for potential non-response, the sample size was rounded up to 250.

Sampling Technique: The participants were recruited using convenience sampling technique from households, eye clinics and optical dispensing centres in Mpama Community, Egbu. Respondents who met the inclusion criteria and were available during the period of data collection were recruited consecutively until the sample size was obtained.

2.5. Inclusion Criteria

2.5.1. The study included

- Spectacle wearers aged 18–50 years.
- Individuals who had been using spectacles for at least one year prior to the study.
- Residents of Mpama community, Egbu, Owerri North LGA, Imo State.
- Individuals who gave informed consent to participate in the study.

Exclusion Criteria

2.5.2. The study excluded

- Individuals who were not spectacle wearers.
- Spectacle wearers who had used spectacles for less than one year.
- Individuals who were seriously ill or unable to respond to the questionnaire adequately at the time of data collection.
- Individuals who declined consent to participate in the study.

2.5.3. Instrument for Data Collection

A structured questionnaire adapted from validated spectacle care and Knowledge, Attitude, Practice (KAP) studies4›5›6 was used. The instrument consisted of

- Section A: Sociodemographic characteristics
- Section B: Knowledge of eyeglass care (10 items)
- Section C: Practice of eyeglass care (8 items)

An Observation checklist: Respondents were directly observed on how they handle and store their eyeglasses. This included;

- Whether eyeglasses are stored in protective cases
- Whether spectacles are cleaned with appropriate materials
- How spectacles are worn and removed

2.6. Validity of Instrument

The questionnaire used for this study was adapted from previously validated Knowledge, Attitude and Practice (KAP) studies on spectacle and eyeglass care. To ensure applicability and relevance to the study objectives and population, the questionnaire and observation checklist were further reviewed by experts in Optometry and Public Health. Necessary corrections and modifications were effected based on their recommendations before final distribution of the questionnaires.

2.7. Reliability of Instrument

A pilot study was conducted among 10% of the study population in a neighboring community. Responses obtained were analyzed using cronbach's alpha statistical test to determine the reliability of the instrument. The reliability testing yielded a Cronbach's alpha of 0.78. A cronbach's alpha coefficient of 0.70 and above was considered acceptable, indicating that the instrument was reliable.

2.8. Method of Data Collection

The researcher visited selected households, eye clinics, and optical dispensing centers within the study area to identify eligible participants. The purpose of the study was explained to the respondents and informed consent was obtained before administration of the questionnaire. Respondents were assured of confidentiality and anonymity throughout the study. The questionnaires were administered directly to the participants by the researcher and trained research assistants. For respondents who had difficulty reading or understanding the questions, the items were explained in simple English or the local language where necessary. The researcher, while using the observation checklist also observed the respondents on how they handle and store their eyeglasses. Completed questionnaires were checked for completeness and consistency before retrieval.

2.9. Data Analysis

Data were analyzed using SPSS version 26. Descriptive statistics were presented as frequencies and percentages. Associations were tested using chi-square statistics. Statistical significance was set at $p<0.05$.

2.10. Ethical Considerations

Ethical approval was obtained from the Research Ethics Committee, School of Health Technology, Federal Polytechnic Nakade, Owerri. Written informed consent was obtained from participants. Confidentiality and anonymity were also maintained.

3. Results

Table 1 Sociodemographic Characteristics of respondents (n=250)

Variable	Category	Frequency(n)	Percentage
Age group (years)	18- 28	83	33.2
	29-39	101	40.4
	40-50	66	26.4
Sex	Male	122	48.8
	Female	128	51.2
Educational level	No formal Education	5	2.0
	Primary Education	36	14.4
	Secondary	123	49.2
	Tertiary	86	34.4
Occupation	Student	51	20.4
	Trader	77	30.8
	Civil servant	66	26.4
	Artisan	56	22.4

Table 1 above shows that a total of 250 participants were involved. Most (40.4%) respondents were within the age range of 29-39 years, 33.2% of them were aged 18-28 years, while 26.4% of them were aged 40-50 years. Females constituted a slightly higher proportion (51.2%) of participants. Educational levels were: no formal educaton (2%) primary (14.4%), secondary (49.2%), and tertiary (34.4%). Most of the respondents were traders (30.8%) and civil servants (26.4%).

Table 2 Knowledge of Eyeglass Care among Respondents

S/N	Variable	YES f (%)	NO f (%)	Not sure f (%)
1	Eyeglass should be cleaned regularly	220 (88.0)	18 (7.2)	12 (4.8)
2	Using tissue paper may scratch spectacle lenses	84 (33.6)	124 (49.6)	42 (16.8)
3	Microfiber cloth is recommended for cleaning lenses	88 (35.2)	110 (44.0)	52 (20.8)
4	Hot water can damage spectacle lenses	61 (24.4)	134 (53.6)	55 (22.0)
5	Spectacles should be stored in a protective case	111 (44.4)	96 (38.4)	43 (17.2)
6	Placing spectacles face down can damage spectacle lenses	92 (36.8)	116 (46.4)	42 (16.8)
7	Using both hands to remove spectacles helps prevent frame damage	80 (32.0)	124 (49.6)	46 (18.4)
8	Dirty spectacles can affect vision quality	190 (76.0)	30 (12.0)	30 (12.0)
9	Spectacles should be kept away from excessive heat	74 (29.6)	118 (47.2)	58 (23.2)
10	Regular professional adjustment is important	90 (36.0)	100 (40.0)	60 (24.0)

Each correct response was scored 1 mark and incorrect answer scored 0 mark. Scores were categorized as:

- 0-4 (Poor knowledge)
- 5-7 (Moderate knowledge)
- 8-10 (Good knowledge)

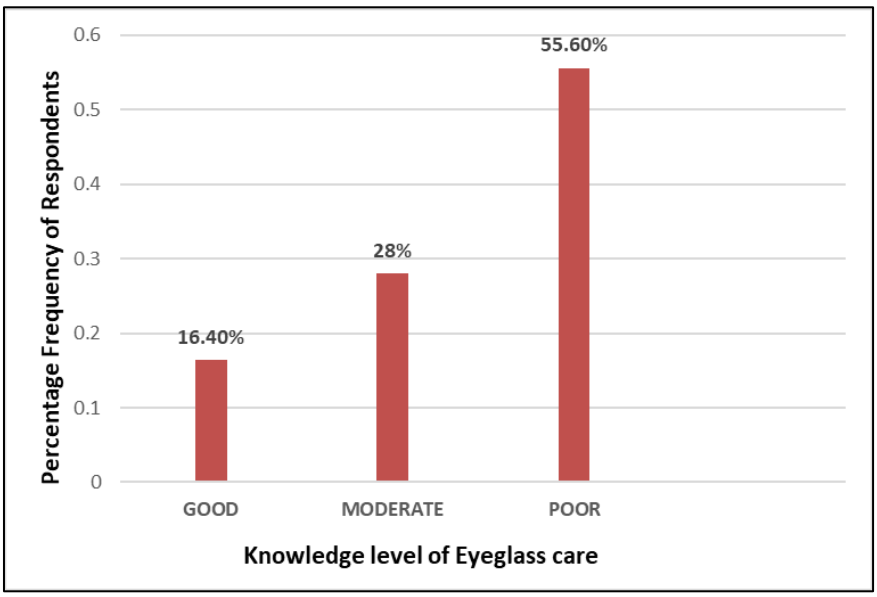

Figure 1 Overall Knowledge Level of Eyeglass care among Respondents

Only 16.4% of respondents showed good knowledge of eyeglass care, while 28% had moderate knowledge and 55.6% had poor knowledge of eyeglass care.

Table 3 Practices of Eyeglass Care among Respondents

S/N	Questions	Responses	N	(%)
1	How often do you clean your eyeglasses?	Several times daily	23	9.2
		Once daily	82	32.8
		Occasionally	145	58.0
	Total		250	100
2	What do you use to clean your eyeglasses?	Microfiber cloth	50	20.0
		Tissue paper	81	32.4
		Ordinary cloth/ handkerchief	102	40.8
		Water only	17	6.8
	Total		250	100
3	How do you store your glasses when not in use?	Spectacle case	64	25.6
		Pocket/bag	109	43.6
		Table/bed surface	77	30.8
	Total		250	100
4	How do you wear your spectacles?	With one hand	135	54.0
		With both hands	115	46.0
	Total		250	100
5	How do you remove your spectacles?	Removed with one hand	149	59.6
		Removed with both hands	101	40.4
	Total		250	100
6	Do you allow others wear your spectacles?	Yes	48	19.2
		No	202	80.8
	Total		250	100
7	How often do you visit an eye clinic for spectacle check-up or adjustment?	Every 6 months	24	9.6
		Once a year	49	19.6
		Only when there is a problem	129	51.6
		Never	48	19.2
	Total		250	100
8	Do you place your spectacles face down on surfaces?	Always	87	34.8
		Sometimes	118	47.2
		Never	45	18.0
	Total		250	100

Each correct response was scored 12.5 marks and incorrect answer scored 0 mark. Scores were categorized as:

- <50% (Poor Practice)
- 50-74% (Moderate/Fair Practice)
- ≥75% (Good Practice)

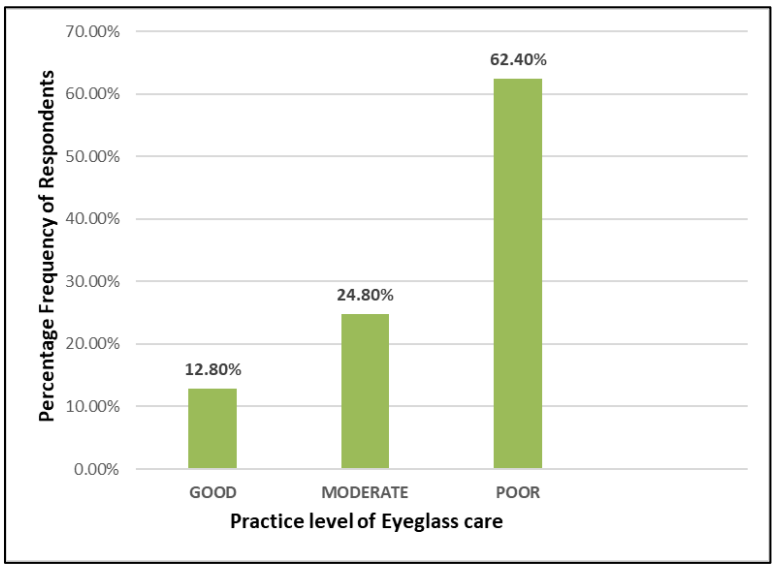

Figure 2 Overall Practice Level of Eyeglass care among Respondents

Good practice was noted in only 12.8% of participants and poor practice in 62.4 % of participants. More than half (58%) of the respondents reported cleaning their eyeglasses only occasionally and many respondents reported cleaning their spectacles with clothing materials (40.8%) and tissue paper (32.4%) while only 20% used recommended microfiber clothes. Some (43.6%) stored their eye glasses in pockets/bags without protective cases, others (30,8%) kept theirs on the table/bed surface while only 25.6% used protective spectacle case. More than half of the respondents used only one hand while wearing (54.0%) and removing (59.6%) their spectacles which could increase the likelihood of frame damage. Most (51.6%) of the respondents reported visiting the eye clinic only when they had problems. Only 9.6% of respondents reported visiting the eye clinic every six months for spectacle check-up and adjustment. Only 18% of respondents reported never keeping their spectacles face down on surfaces. The rest agreed to have kept their spectacles face down always (34.8%) and sometimes (47.2%). Overall, the study demonstrated poor eyeglass care practices among spectacle wearers in Mpama community, Egbu, Imo state, as 62.4% of respondents were categorized as having poor eyeglass care practices.

Table 4 Factors Influencing Eyeglass Care Practices among Respondents (n = 250)

S/N	Variable	SA f (%)	A f (%)	D f (%)	SD f (%)
1	Lack of knowledge affects proper eyeglass care	102 (40.8)	97 (38.8)	33 (13.2)	18 (7.2)
2	Cost of cleaning materials affects eyeglass care	86 (34.4)	95 (38.0)	43 (17.2)	26 (10.4)
3	Busy schedule prevents proper spectacle maintenance	65 (26.0)	90 (36.0)	57 (22.8)	38 (15.2)
4	Instructions from eye care professionals improve eyeglass care	112 (44.8)	95 (38.0)	27 (10.8)	16 (6.4)
5	Educational level influences eyeglass care practices	94 (37.6)	90 (36.0)	44 (17.6)	22 (8.8)
6	Forgetfulness affects spectacle maintenance	67 (26.8)	96 (38.4)	57 (22.8)	30 (12.0)
7	Availability of spectacle accessories influences care practices	84 (33.6)	92 (36.8)	47 (18.8)	27 (10.8)
8	Good eyeglass care prolongs the lifespan of spectacles	130 (52.0)	84 (33.6)	23 (9.2)	13 (5.2)

Key: SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree

Table 4 above shows the factors influencing eyeglass care practices among respondents in Mama Community, Egbo, Imo State. Majority of the respondents strongly agreed or agreed that lack of knowledge affects proper eyeglass care practices, with 102 (40.8%) strongly agreeing and 97 (38.8%) agreeing. Similarly, most respondents believed that the cost of cleaning materials influences eyeglass care practices, as 86 (34.4%) strongly agreed and 95 (38.0%) agreed. Regarding professional guidance, 112 (44.8%) strongly agreed and 95 (38.0%) agreed that instructions from eye care professionals improve eyeglass care practices.

The findings further revealed that educational level plays an important role in eyeglass care practices, with 94 (37.6%) strongly agreeing and 90 (36.0%) agreeing. In addition, majority of respondents acknowledged that good eyeglass care prolongs the lifespan of spectacles, as indicated by 130 (52.0%) who strongly agreed and 84 (33.6%) who agreed. Overall, the findings suggest that knowledge, educational status, cost of materials, professional counseling, and availability of accessories significantly influence eyeglass care practices among respondents.

Table 5 Association between Socio-demographic characteristics of respondents and Practice of Eyeglass care

Variable	**Category**	**Good Practice n (%)**	**Poor Practice n (%)**	**Total**	$\chi 2$	p-value
Age group (years)	18- 28	38 (45.8)	45 (54.2)	83	4.62	0.099
	29-39	56 (55.4)	45 (44.6)	101		
	40-50	28 (42.4)	38 (57.6)	66		
Sex	Male	54 (44.3)	68 (55.7)	122	2.11	0.146
	Female	68 (53.1)	60 (46.9)	128		
Educational level	No formal Education	1 (20%)	4 (80%)	5	8.92	0.030*
	Primary Education	12((33.3)	24 (66.7)	36		
	Secondary	59 (48.0)	64 (52.0)	123		
	Tertiary	51 (59.3)	35 (40.7)	86		
Occupation	Student	31 (60.8)	20 (39.2)	51	8.27	0.041*
	Trader	32 (41.6)	45 (58.4)	77		
	Civil servant	36 (54.5)	30 (45.5)	66		
	Artisan	23 (41.1)	33 (58.9)	56		

Key; For easier chi-square testing, Practice of eye glass care was later regrouped into two outcomes; "Good Practice" and "Poor Practice". This means that respondents captured as those who demonstrated moderate eyeglass care practice, were later grouped under good practice. Therefore; Good practice =respondents demonstrating 50-100% eyeglass care practices; Poor practice= respondents demonstrating below 50% eyeglass care practices; $P < 0.05$ indicates statistically significant association

3.1. Interpretation

Table 5 above shows that educational level and occupation were significantly associated with eyeglass care practices among respondents ($p<0.05$). Respondents with tertiary education demonstrated better eyeglass care practices compared to those with no formal education, primary and secondary education. In the same way, students and civil servants showed better practice levels than traders and artisans. However, age and sex were not significantly associated with eyeglass care practices ($p> 0.05$).

4. Discussion

This study revealed that 55.6% of respondents had poor knowledge of eyeglass care, while 62.4% demonstrated poor eyeglass care practices. This finding is similar to the study conducted by Prabhu et al. (2016), which reported poor awareness regarding spectacle care and maintenance among regular spectacle users5. Similarly, Yadav and Rani (2023) reported inadequate knowledge concerning proper spectacle handling, cleaning, and maintenance practices among spectacle wearers4. The similarity in findings may be linked to inadequate patient education and poor counseling regarding spectacle maintenance among spectacle users. In addition, the present finding aligns with a study conducted in Ethiopia6, which revealed poor spectacle-related practices among respondents despite moderate awareness levels.

These findings emphasize the need for improved health education and counseling on proper eyeglass care by eye care professionals.

This study revealed that several factors influenced eyeglass care practices among spectacle wearers in Mpama Community, Egbu, Imo State. Lack of knowledge emerged as one of the major factors affecting proper eyeglass care. This finding shows that respondents who lack adequate information regarding appropriate spectacle maintenance are more likely to engage in poor eyeglass care practices. This finding aligns with previous studies which reported that inadequate awareness contributes significantly to poor spectacle maintenance practices among users5. This study also revealed that the cost of cleaning materials affected eyeglass care practices. This may be because some respondents could not afford appropriate cleaning accessories such as microfiber cloths and lens cleaning solutions, hence using inappropriate materials like tissue paper and clothing fabrics.

Furthermore, the majority (46.4%) of respondents strongly agreed that instructions from eye care professionals improve eyeglass care practices. This finding emphasizes the importance of patient education and counseling during eye clinic visits. Individuals who receive appropriate guidance from eye care professionals are more likely to take up proper spectacle maintenance practices. Educational level was also identified as a significant factor influencing eyeglass care practices. Respondents with higher educational attainment demonstrated better understanding and compliance with proper spectacle care procedures. The relationship between higher educational attainment and improved eyeglass care practice is in line with findings from Ethiopia and South Africa, where education significantly affected spectacle-related behaviours6›8. This suggests that health literacy plays a major role in appropriate eyeglass maintenance as there is most likely better access to health information among educated individuals. Finally, more than half (52.8%) of the respondents strongly agreed that good eyeglass care prolongs the lifespan of spectacles. This suggests that respondents recognize the benefits of proper spectacle maintenance despite the poor practices observed among many participants.

Though Nigerian studies have documented barriers to spectacle utilization and poor awareness of refractive errors7›9, limited attention has been presented to maintenance practices. This study therefore contributes novel local evidence emphasizing the need for improved patient counselling at dispensing points.

5. Conclusion

Knowledge and practice of eyeglass care among spectacle wearers in Mpama, Egbu, Owerri north, Imo state are inadequate. Educational interventions, demonstration of proper cleaning techniques at Eye clinics, Optical dispensing centres, and community outreach programs are recommended to improve spectacle durability and visual comfort.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare no conflict of interest

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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