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# Knowledge of Ocular prosthesis among students of Optical Dispensary Technology, Birnin Kebbi, Nigeria

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## Abstract

**Background:** Ocular prosthesis (OP) is produced and fitted by eye care personnel called Ocularist. OP is made from cryolite glass or acrylic resin. OP can either be customized or stock and it is commonly inserted by 6-8 weeks following destructive ocular surgery.
**Aim:** The aim of this study was to ascertain the knowledge and awareness of ocular prosthesis among students of School of Optical Dispensary Technology, Birnin Kebbi, Nigeria.
**Materials and methods:** This was a cross-sectional study conducted over 3 months (1st April 2022-30th June 2022) among the students of School of Optical dispensary technology using self-administered questionnaires. The questionnaires extracted information on the socio-demographic characteristics such as age, sex, tribe, religion, marital status, year of study and knowledge of ocular prosthesis among the students. Data was analyzed using SPPS version 21.
**Results:** One hundred and thirteen questionnaires were distributed to all the students in the school and 97 students participated in the study leading to a response rate of 86 %.
There were 47(48.5%) males and 50 (51.5%) females aged between 16 - 40 (mean age 24±5) years. Most of the participants 72 (74.2%) agreed that eye care (management of patient with eye problem) is a team work. Most (67, 69%) participants have heard about ocular prosthesis mainly through Seminar/Teaching (32%) and television (26%). Overall, third year students had adequate knowledge (73%) of ocular prosthesis compared with second year (49%) and first year (43%) students.
**Conclusion:** The awareness of ocular prosthesis among students of School of Optical dispensary technology Birnin Kebbi appeared better with number of years spent in the school. The importance of seminar/teaching and television in the dissemination of health information is underscored.

Keywords: Ocular prosthesis, destructive eye surgery, students of optical dispensary technology

## Introduction

Ocular prosthesis also called artificial eye, is a special material produced by an Ocularist for use by a patient with anophthalmic socket[1] (a patient with orbit but devoid of eye ball with or without extraocular muscles and orbital fat). Surgeries that involve removal of the eye include evisceration, enucleation and exenteration.[1] Evisceration is the removal of the cornea and intraocular contents, leaving the scleral and the optic nerve; enucleation is the removal of the whole eye and optic nerve, this procedure is usually done for intraocular tumors. Exenteration is the

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removal of the whole eye, extraocular muscles, optic nerve, orbital fat and part of the orbital bone.[1] Exenteration is usually done to treat advanced intraocular tumor and fungal eye infection (rhino-orbital mucormycosis). Eye removal in ophthalmology is commonly done for congenital conditions like anophthalmia and microphthalmia. However, acquired eye condition from infections (endophthalmitis and panophthalmitis), intraocular tumor (retinoblastoma, squamous carcinoma of the conjunctival), painful blind eye from glaucoma, phthisis, severe irreparable eye trauma and unsighted eye (anterior staphyloma) are also indications for an eye removal.[1]

Ocular prosthesis (OP) was first used in an Iranian woman between 2900 - 1800 BC.[2] However, by the fifth Century BC, OP was produced from painted clay by Roman and Egyptian Priests.[3] The modern OP is made from cryolite glass or acrylic resin. OP is commonly inserted by 6 - 8 weeks following removal of an eye.[1] OP can either be customized or stock (ready-made). Custom made ocular prosthesis gives better cosmetics than stock, because of similarity between the contralateral eye in terms of iris size, color and scleral blood vessels. Ocular prosthesis can either be inserted on an orbital implant or not. However, OP insertion with orbital implants gives better cosmetic appearance in terms of motility. An ocular prosthesis does not give vision.

Eye removal in a patient result in emotional disturbance, facial asymmetry, lack of social interaction and psychological disturbance.[4] Insertion of ocular prosthesis result in improvement in quality of life[5], social life, self-esteem, and good facial appearance.[6]

The aim of this study was to ascertain the knowledge and awareness of ocular prosthesis among students of Optical Dispensary Technology, Birnin Kebbi, Nigeria. The knowledge gain from this study will help in future training of these categories of eye care workers in the act of insertion of OP in anophthalmic patient and furthermore help in the plan for setting up Ocularist school in Kebbi State.

## Materials and Methods

This was a 3-month descriptive cross-sectional study conducted between 1st April 2022 to 30th June 2022, among the students of Optical Dispensing Technology Birnin Kebbi, Kebbi State, Nigeria, using pre-tested, semi-structured questionnaires. The school was the first such school in Nigeria, established on 2nd February 2007 by Federal Medical Centre, Birnin Kebbi. An Ordinary National Diploma (OND) award school started with 6 students in 2007 which as at May 2022 have a total of 113 students with 14 lecturers. The job description of the optician includes; fitting and dispensing of eyeglasses, advice patients on how to wear and take care of their spectacles, adjustment of frames, lenses, and making sure that the ordered eyeglasses are fitted correctly.

The questionnaires were administered by the researchers to all the students in the school. Excluded were the students who did not consent to participate in the study. The questionnaires extracted information on socio-demographics characteristics (age, sex, religion, tribe, marital status and year of study) of the students, as well as the student's knowledge and awareness on ocular prosthesis. Each question has three options: True, False and I do not know. A correct answer was scored 1 while; the wrong answer was scored 0.

Overall score of 50% and above is marked as adequate knowledge of ocular prosthesis while, less than 50% score was marked as inadequate knowledge.

The questionnaires were pre-tested among the students of Kebbi State School of Nursing Birnin-Kebbi and the problem noticed during this pre-test was corrected. The data was collated and analyzed using Statistical Package for the Social Science version 20 (SPSS 2006, Chicago, Illinois, USA). Analysis was done using simple frequency. The Fisher's exact was used to test association between socio-demographic characteristic of the participants and knowledge of ocular prosthesis. The statistical significance was taken as $P<0.05$

The ethical approval for the study was sought and obtained from Health Research Ethics Committee of Federal Medical Centre. Informed written consent was also obtained after the study was explained to each participating student.

## Results

One hundred and thirteen questionnaires were distributed to all the students and 97 students participated in the study (Response rate was 86 %).

Table 1: Socio-demographic Characteristics of the Participants (N=97)

| Characteristics | Frequency | | | % |
|---|---|---|---|---|
| Age group (years) | Sex | | | |
| | Male | Female | Total | |
| 16-25yrs | 33 | 42 | 75 | 77.3 |
| >25yrs | 14 | 8 | 22 | 22.7 |
| Total | 47 | 50 | 97 | 100 |
| Religion | | | | |
| Islam | 82 | | | 84.5 |
| Christian | 13 | | | 13.4 |
| Traditional | 2 | | | 2.1 |
| Marital status | | | | |
| Married | 35 | | | 36.1 |
| Single | 60 | | | 61.9 |
| Divorced | 2 | | | 2.1 |
| Tribe | | | | |
| Hausa | 63 | | | 64.9 |
| Yoruba | 20 | | | 20.6 |
| Igbo | 3 | | | 3.1 |
| Others | 11 | | | 11.3 |
| Students level year | | | | |
| Year 1 | 40 | | | 41.2 |
| Year 2 | 35 | | | 36.1 |
| Year 3 | 22 | | | 22.7 |

*Others: Nupe, Dankakari, Ijaw, Ibiriba

Table 2: Responses to the questionnaires on knowledge of ocular prosthesis (N=97)

| Questions | Responses | Frequency | % |
|---|---|---|---|
| Do you know that eye care is a team? | Yes | 72 | 74.2 |
| | No | 9 | 9.3 |
| | I do not know | 16 | 16.5 |
| Have you ever hear ocular prosthesis | Yes | 67 | 69.1 |
| | No | 19 | 19.6 |
| | I do not know | 11 | 11.3 |
| Ocular prosthesis is made from PMMA (acrylic)? | Yes | 51 | 52.6 |
| | No | 20 | 20.6 |
| | I do not know | 26 | 26.8 |
| Have you ever seen someone with ocular prosthesis? | Yes | 53 | 54.6 |
| | No | 35 | 36.1 |
| | I do not know | 9 | 9.3 |
| Does ocular prosthesis function like a real eye? | Yes | 49 | 50.5 |
| | No | 35 | 36.1 |
| | I do not know | 13 | 13.4 |
| Does ocular prosthesis help someone to see? | Yes | 38 | 39.2 |
| | No | 38 | 39.2 |
| | I do not know | 21 | 21.6 |
| Prosthesis eye is used for cosmetic purpose? | Yes | 58 | 59.8 |
| | No | 17 | 17.5 |
| | I do not know | 22 | 22.7 |
| Ocular prosthesis can either be custom made? | Yes | 58 | 59.8 |
| | No | 18 | 18.6 |
| | I do not know | 21 | 21.6 |
| Ocular prosthesis can either be stock made? | Yes | 54 | 55.7 |
| | No | 16 | 16.5 |
| | I do not know | 27 | 27.9 |
| Custom made ocular prosthesis is better than stock made? | Yes | 52 | 53.6 |
| | No | 10 | 10.3 |
| | I do not know | 35 | 36.1 |
| Ocular prosthesis is made from glass? | Yes | 47 | 48.5 |
| | No | 28 | 28.9 |
| | I do not know | 22 | 22.7 |
| Not properly fitting ocular prosthesis can result in complication? | Yes | 56 | 57.7 |
| | No | 8 | 8.2 |
| | I do not know | 33 | 34.0 |

Table 3: Association between socio-demographic characteristic of the participants and knowledge of ocular prosthesis

| Variable | Knowledge | | $X^2$ | Df | p-value |
|---|---|---|---|---|---|
| | Adequate knowledge (%) | Inadequate knowledge (%) | | | |
| **Age (years)** | | | 2.763 | 2 | 0.251 |
| 16-25 | 41(54.7) | 34(45.3) | | | |
| 26-36 | 9(45) | 11(55) | | | |
| >37 | --0(0) | 2(100) | | | |
| **Sex** | | | 0.009 | 1 | 0.927 |
| Male | 24(51.1) | 23(48.9) | | | |
| Female | 26(52) | 24(48) | | | |
| **Year** | | | 5.386 | 2 | 0.058 |
| Year 1 | 17(42.5) | 23(57.5) | | | |
| Year2 | 17(48.6) | 18(51.4) | | | |
| Year 3 | 16(72.7) | 6(27.3) | | | |
| **Marital status** | | | 2.977 | 2 | 0.226 |
| Married | 14(40) | 21(60) | | | |
| Single | 35(58.3) | 25(41.2) | | | |
| Divorced | 1(50) | 1(50) | | | |
| **Religion** | | | 1.986 | 2 | 0.370 |
| Islam | 41(50) | 41(50) | | | |
| Christianity | 7(53.8) | 6(46.2) | | | |
| Traditional | 6(46.2) | -- | | | |

Table 4: Knowledge category of the participants (N=97)

| Knowledge | Frequency | % |
|---|---|---|
| Adequate knowledge | 50 | 51.5 |
| Inadequate knowledge | 47 | 48.5 |
| Total | 97 | 100 |

There were 47 (48.5%) males and 50 (51.5%) females (M: F=0.94:1). The age range of the respondents was 16 - 40 (mean age 23.6 ± 4.6 SD) years. Forty participants (41.2%) were in year 1. Majority of the students were Hausa by tribe (n=63, 64.9%), practiced Islam (n=82, 84.5%) and single (n=60, 61.9%) [Table 1].

Regarding the general knowledge of ocular prosthesis, majority of the participants (n=72, 74.2%) agreed that eye care is a team work, and have heard about OP (n=67, 69%). More than half agreed that OP is made from PMMA (poly methyl methacrylate) 52.6% and glass, 48.5%. About half of the participants, 53 (54.6%) have seen someone using OP. Most the students agreed that OP can either be custom made 58 (59.8%) or stock made (ready-made) 54 (55.7%). Fifty two (53.6%) participants agreed that custom made OP is cosmetic better than stock made. Majority (n=58, 69.8%) agreed that prosthetics eye is used for

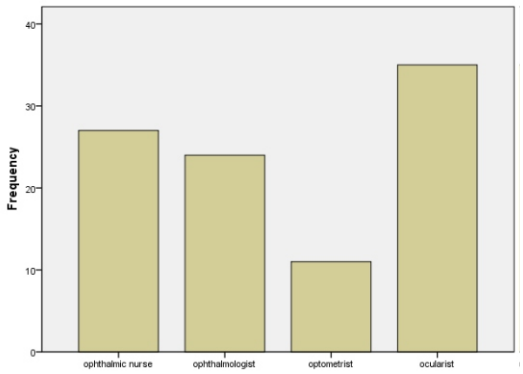


Figure 1: Who produce prosthesis eye

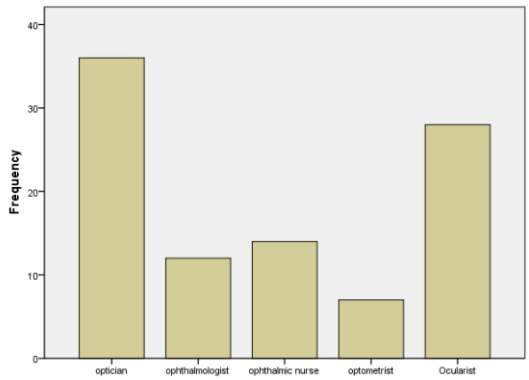


Figure 2: Who fit ocular prosthesis

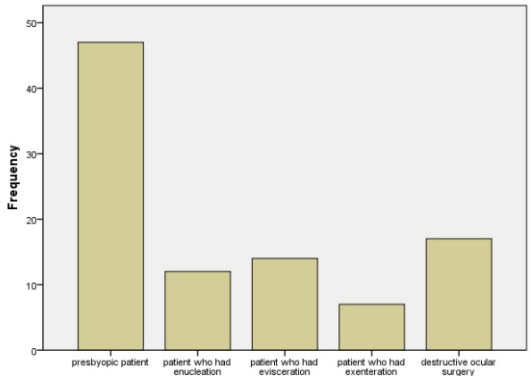


Figure 3: Who are the people that used ocular prosthesis

cosmetic purpose and about half (n=49, 50.5%) of the participants wrongly thought OP functions as a real eye. Less than half (n=38, 39.2%) of the respondents erroneously believed that OP makes someone to see, and more than half 56(57.7%) agreed that incorrectly fitted OP can result in complications.

Less than half (36%) of the respondents agreed that ocular prosthesis is produced by Ocularists (figure 1) and fit by Optician 37% (figure 2).

About 18% agreed that ocular prosthesis is used following destructive ocular surgery (figure 3) and

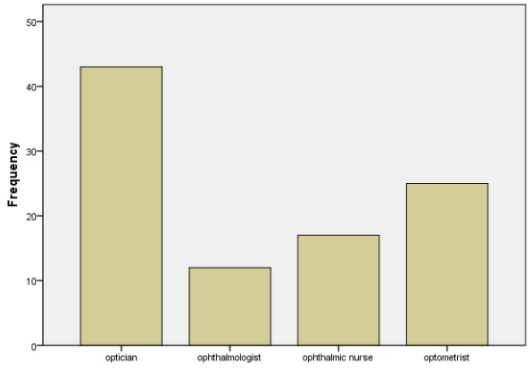


Figure 4: Where there is no Ocularist who is responsible for fixing prosthesis eye

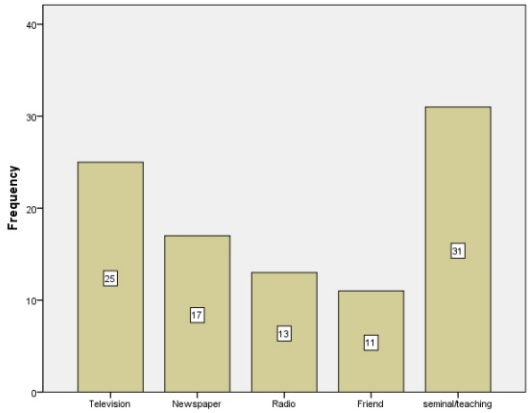


Figure 5: Sources of information about ocular prosthesis

44% agreed that optician fit ocular prosthesis when there is no Ocularist (figure 4).

Seminar/Teaching (32%) and television (26%) were the main sources of information about ocular prosthesis among the participants (figure 5).

Overall, year 3 students had adequate knowledge (73%) of ocular prosthesis compared to year 1 (43%) and year 2 (49%) students but slightly significant (P<0.058). The associasion between socio-demographic characteristic of the participants(age ,sex, year of study and marital status) and knowledge of ocular prosthesis were not significant (P>0.05) table 3.

Half (52%) of the participating students have adequate knowledge about ocular prosthesis (Table4).

## Discussion

Published work on knowledge of ocular prosthesis among students is very scanty. In this study, majority of the students were females, in contrast to report from most of other studies[7-8] from higher

institutions in the north-western part of Nigeria that reported males' preponderance. The difference might be because females find the school more appealing in terms of closeness to their locality and support from their families. It may also indicate the gains of stakeholders (both government and non-governmental organizations) campaign effort on improved female child education through enrolment in schools. Most of the participants were Hausa by tribe 63(64.9%) and practice Islam 82(84.5). This does not come as a surprise as the study area is mainly inhabited by Hausa Muslims.

In this present study, majority of the participants 72 (74.2%) agreed that eye care is a team work and this was in agreement with previous study by Monsudi et al.[7] in 2017. In our study 39.2 % of the participants agreed that ocular prosthesis (OP) do not make people to see. This was lower than 85 % reported by Gadeer et al. The difference in the result might be because of the different in the methodology.[9] Majority of respondents agreed that custom made OP is better than stock made. This was in agreement with previous study.[10] In our study majority of the students agreed that ocular prosthesis is produced by Ocularist, and that opticians are the primary eye care team that fixed OP. Regrettably, the popular option among the respondents was the wrong choice as the manufacturing and fixing of OP is the duty of the Ocularist. The reason for the choice of wrong answer by the participants' may be because of difficulty to distinguish glasses fixation from artificial eye insertion. However, further research needs to clarify this. The mixed up on the manufacture and who insert OP shows a deficit in understanding among the participants and this can be addressed through lecture in differentiating between fixing eyeglasses and artificial eye.

The majority of the respondents also agreed that in the absence of Ocularist, the Optician can fix the artificial eye. This view was also wrong because OP insertion is not job specification of an Optician.

The choice of the majority of the respondents that OP are mainly used by presbyopic was wrong. The reason why students choose presbyopia may be because of poor knowledge of OP. In this current study hospital seminar/teaching organized by ophthalmology department were the main sources of information on ocular prosthesis by the students. This was similar to previous studies in higher institutions[8,11] but different from others studies.[12-14] The difference may be because students took hospital seminar and teaching as part of school programme. Newspaper ranked second as the source of information on ocular prosthesis. This was higher than what was reported in previous studies from Nigeria[13] and India.[14] The difference might be because the students preferred to make use of free internet access in the hospital library and the school.

Seminal/teaching is the main sources of information on OP among the participants while, information from friend was the lowest source. This may suggest that group discussions are not common among the students. Hence the school authority should encourage group discussion as an important source of learning.

## Conclusion

The knowledge of the students about ocular prosthesis was high, but lack knowledge on who fit ocular prosthesis. The importance of seminar/teaching and television in the dissemination of health information are underscored.

## Recommendation

Ocular prosthesis should be introduced in to the school curriculum.

Limitation of this study is the small number of study participants. Large population study and focal group discussion might be more revealing on the knowledge of ocular prosthesis.

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