

# Awareness and knowledge of ocular cancers in a resource-limited economy

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## Abstract

**Aims:** To determine awareness and knowledge of ocular cancers in a resource-limited setting. **Material and Methods:** A descriptive cross-sectional survey (2009) of 1,887 Nigerians using interviewer-administered questionnaire. **Results:** Respondents were 55.6% males, and mean age was 30 years, SD 9.5. Most respondents (77.8%) had at least secondary education. Fewer respondents were aware of eye cancers (57.1%) compared to cancers in general (73.7%) ( $P < .001$ ). Despite the male preponderance there were no associations between gender and awareness of ocular cancers ( $P = 0.07$ ) and cancers in general ( $P = 0.85$ ). However, education was associated with awareness of ocular cancers ( $P < .001$ ) and cancers in general ( $P < .001$ ). Ocular cancers were thought to be caused by corrosives 33.2%, trauma 21.4%, witchcraft 18.6%, genetic transmission 15.7%, sunlight 8.0%, radiations 2.5% and infections 0.6% ( $n = 883$ ). Of 280 respondents, 41.1% based their knowledge of patients having ocular cancers on sources other than hospital diagnosis. Of 148 respondents, 16.2% were related to 'patients' they knew had ocular cancers. There were 202 respondents who indicated challenges to accessing orthodox medical eye care services by ocular cancer patients as high cost 55.5%, long waiting period 23.3%, long distance 15.4% and poor attitude of health workers 5.9%. **Conclusion:** Awareness of ocular cancers compared to other cancers is low. Misconceptions on the causes of ocular cancers exist. Public ocular cancers health education can enhance awareness. The need to address barriers to accessing eye care is underscored.

**Keywords:** Awareness, challenges to eye care, health education, ocular cancers.

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## Introduction

The eye is not immuned from developing cancers; it has its own share of primary and secondary cancers. Tumors refer to new growths and are quite dreadful to both careers and patients alike especially when malignant. Yet, the safety of benign ones is not absolute.

Generally, cancers neither have respect for body organs nor human demographics. This notwithstanding, the world appeared to be more aware of certain cancers particularly cancers of the breast, prostate, cervix, and leukemia

among others. Unlike aforesaid other cancers, ocular cancers (OC) have not received the required attention especially in a resource-limited economy. Nevertheless, medical experts are not unaware of potential danger of cancers, irrespective of the involved organ.

Aside the apparent societal informal low prioritization ranking, especially in a resource-limited economy, OC are faced by many challenges. Its awareness and knowledge among the populace are below what they should be, especially with low literacy levels and absent public ocular

cancer health education messages. This can be seen in the patients' attitude of presenting late with OC, expected quick resolution even when the cancer is advanced, patient discharging self from the hospital against medical advice to seek alternative traditional treatment among others [1, 2].

Moreover, the available medical management options for OC in a resource-limited economy are not abreast of what is currently available in advanced economies. Most are managed by general ophthalmologists with no specialized training in OC. This deficiency of ocular oncologists may be so as the available few ophthalmologists are more involved with the albeit not necessarily fatal, backlog of avoidable causes of blindness coupled with the lack of training and diagnostic facilities in eye care institutions. Ocular oncology needs to be developed in resource-limited economies alongside other subspecialties of eye care. Achieving this requires particular attention to these challenges which will be an invaluable benefit in preventing blindness and loss of lives consequent to OC [2].

Almost all studies on ocular tumors in Nigeria, a resource-limited economy, are hospital based and are concerned with the pattern especially, clinicopathological reports of oculo-orbital tumors [3-9]. There is paucity of epidemiological data on OC among Nigerians.

Efforts towards improving the care of OC in a resource-limited economy will be enhanced by some base line data on the perception of the populace on OC. This paper reports on the awareness and knowledge of OC in a resource-limited economy. The findings would be fundamental to developing OC advocacy programs including public awareness campaigns towards early detection and treatment. Moreover, creating awareness would generate good political will towards the care of patients with OC.

## Materials and Methods

This study was undertaken in Abuja, the Federal Capital Territory (FCT), Nigeria between June and September, 2009 following the guidelines in the declaration of Helsinki. Ethical approval for the study was obtained from University of Abuja Teaching Hospital Health Research Ethics Committee and informed consent to participate was obtained from individual respondents.

A pre-tested semi-structured questionnaire was administered to determine the awareness, knowledge, attitudes, beliefs and practices on ocular cancers (OC). This paper focuses on awareness and knowledge of OC in Nigeria. The paper on attitudes, beliefs and practices is under consideration elsewhere. All respondents who participated in the pilot study were not included in this analysis.

A sample size [10] of 1,536 respondents was determined using the equation  $n = z^2pq/d^2$  where  $n$  is the desired

sample size (since the population of Nigerians living in FCT is more than 10, 000). The expected prevalence of awareness of OC amongst Nigerians ( $p$ ) was estimated to be 40% as extrapolated from a related study in India [11]. Other parameters were standard normal deviation ( $z$ ) of 1.96, a confidence level of 95% and desired precision due to random sampling error ( $d$ ) of 2.5%.

The FCT is divided into 6 administrative units-Area Councils. By a stratified cluster random sampling technique, three Area Councils - Abuja Municipal, Kuje and Gwagwalada - were selected for this study. Three clusters were subsequently randomly selected from each of the selected area councils. Overall, 9 clusters of 220 respondents per cluster were included in the study. Data collection was done by the authors and five trained field assistants who were fluent in Nigerian languages and English. Inclusion criteria were being Nigerians, 18 years and older, and living in the FCT during the study period.

### Statistical Study

The data was collated, entered and analyzed using SPSS 16 (SPSS Inc, USA). Cross tabulations of respondents' gender and literacy level were carried out. The test of significance was performed using the Chi-square test for some parameters including the respondents' level of awareness of cancers (in general) and ocular cancers; the respondents' awareness and their level of education, gender, marital status and faith practiced. The level of significance for statistical difference was taken at  $P < 0.05$ .

## Results

### Demographic characteristics

There were 1,887 respondents comprising of 1,050 (55.6%) males and 837 (44.4%) females (M: F=1.3:1) with an age range of 18 to 80 years, and a mean of 30 years, SD 9.5. The respondents cut across all the 36 states of Nigeria and the FCT, and are from over one hundred ethnic groups of Nigeria. All religious groupings were represented. The respondents' demographic characteristics are shown in Table 1.

### Awareness of ocular cancers

Only (57.1%) respondents were aware of ocular cancers compared to (73.7%) respondents who were aware of cancers in general (Fig. 1) and was statistically significant ( $\chi^2 = 101.618$ ,  $P < .001$ ). Though the male respondents predominated there were no significant associations between gender and awareness of OC ( $\chi^2 = 3.212$ ,  $P = 0.07$ ) and cancers in general ( $\chi^2 = 0.036$ ,  $P = 0.85$ ). However, the level of education was significantly associated with awareness of OC ( $\chi^2 = 50.414$ ,  $P = .001$ ) in particular and cancers in general ( $\chi^2 = 416.926$ ,  $P = .001$ ). The awareness of OC is not associated with the respondents' marital status ( $P = 0.50$ ) and the faith practiced by the respondents ( $P = 0.37$ ).

### Knowledge of ocular cancers

The respondents had varied beliefs on the causes of OC including witchcraft/spirits 164 (8.7%) (Table 2).

**Table 1** Demographic data of respondents, n = 1,887

| Age            | Gender  |        | Vocation  |          |         |                   |           |         |            |        |
|----------------|---------|--------|-----------|----------|---------|-------------------|-----------|---------|------------|--------|
|                | M       | F      | *CS       | Trading  | Student | Teaching          | Farming   | Artisan | Dependants | Others |
| ≤20            | 136     | 170    | 11        | 42       | 212     | 5                 | 13        | 11      | 4          | 8      |
| 21- 30         | 461     | 421    | 130       | 222      | 258     | 27                | 86        | 43      | 17         | 99     |
| 31- 40         | 283     | 178    | 139       | 132      | 32      | 21                | 52        | 28      | 6          | 51     |
| 41- 50         | 120     | 50     | 60        | 42       | 4       | 9                 | 30        | 9       | 4          | 12     |
| 51- 60         | 38      | 14     | 13        | 15       | 1       | 4                 | 12        | -       | 2          | 5      |
| 61- 70         | 8       | 4      | -         | 8        | -       | -                 | 2         | -       | 2          | -      |
| 71- 80         | 4       | -      | 1         | 2        | -       | -                 | -         | -       | -          | 1      |
| Total          | 1050    | 837    | 354       | 463      | 507     | 66                | 195       | 91      | 35         | 176    |
| Marital status |         |        |           |          |         | Educational level |           |         |            |        |
| No             | Married | Single | Separated | Divorced | Widowed | Tertiary          | Secondary | Primary | †NFE       |        |
| %              | 877     | 925    | 17        | 14       | 12      | 739               | 632       | 226     | 165        |        |
|                | 47.5    | 50.1   | 0.9       | 0.8      | 0.7     | 41.9              | 35.9      | 12.8    | 9.4        |        |

n=sample size, \*CS = civil service, †NFE = no formal education, M = males, F = females, % = percentages, No = number of respondents.

**Table 2** Gender and literacy distribution of respondents beliefs on causes of eye cancers, n=1,887

| Gender                 | Causes             |           |            |            |          |           |           | Total (%)  |
|------------------------|--------------------|-----------|------------|------------|----------|-----------|-----------|------------|
|                        | Witchcraft/spirits | Genetic   | Trauma     | Corrosives | Sunlight | Radiation | Infection |            |
| Male                   | 104                | 79        | 116        | 154        | 37       | 13        | 3         | 506 (26.8) |
| Female                 | 60                 | 60        | 73         | 139        | 34       | 9         | 2         | 377 (20.0) |
| Total (%)              | 164 (8.7)          | 139 (7.4) | 189 (10.0) | 293 (15.5) | 71 (3.8) | 22 (1.2)  | 5 (0.3)   | 883 (46.8) |
| <b>Education level</b> |                    |           |            |            |          |           |           |            |
| †NFE                   | 8                  | 4         | 1          | 21         | 1        | 2         | -         | 37 (2.0)   |
| Primary                | 11                 | 9         | 4          | 22         | 5        | -         | -         | 51 (2.7)   |
| Secondary              | 72                 | 51        | 53         | 84         | 14       | 4         | -         | 278 (14.7) |
| Tertiary               | 57                 | 66        | 111        | 148        | 44       | 16        | 5         | 447 (23.7) |
| Total (%)              | 148 (7.8)          | 130 (6.9) | 169 (9.0)  | 275 (14.6) | 64 (3.4) | 22 (1.2)  | 5 (0.3)   | 813 (43.1) |

†NFE = no formal education, % connotes percentage

**Table 3** Gender and literacy distribution of sources of respondents' knowledge of 'patients' with ocular cancers

| Gender (n=280)                 | Sources              |           |             |                    |         | Total (%)  |
|--------------------------------|----------------------|-----------|-------------|--------------------|---------|------------|
|                                | Patient as informant | Suspicion | Third party | Hospital diagnosis | Others  |            |
| Male                           | 22                   | 15        | 22          | 101                | 3       | 163 (58.2) |
| Female                         | 29                   | 7         | 17          | 64                 | -       | 117 (41.8) |
| Total (%)                      | 51 (18.2)            | 22 (7.9)  | 39 (13.9)   | 165 (58.9)         | 3 (1.1) | 280 (100)  |
| <b>Education Level (n=266)</b> |                      |           |             |                    |         |            |
| †NFE                           | 3                    | 3         | 5           | 19                 | -       | 30 (11.3)  |
| Primary                        | 11                   | 1         | 5           | 20                 | -       | 37 (13.9)  |
| Secondary                      | 16                   | 9         | 25          | 77                 | -       | 127 (47.7) |
| Tertiary                       | 14                   | 8         | 3           | 44                 | 3       | 72 (27.1)  |
| Total (%)                      | 44 (16.5)            | 21 (7.9)  | 38 (14.3)   | 160 (60.2)         | 3 (1.1) | 266 (100)  |

†NFE = no formal education, % connotes percentages

**Table 4** Gender and literacy distribution of respondents' relationship with 'patients' they knew had ocular cancer

| Gender (n=148)                 | Relationship |         |           |            | Total (%) |
|--------------------------------|--------------|---------|-----------|------------|-----------|
|                                | Parent       | Sibling | Relation  | Others     |           |
| Male                           | 3            | 2       | 8         | 84         | 97 (65.5) |
| Female                         | 1            | 2       | 8         | 40         | 51 (34.5) |
| Total (%)                      | 4 (2.7)      | 4 (2.7) | 16 (10.8) | 124 (83.8) | 148 (100) |
| <b>Education Level (n=137)</b> |              |         |           |            |           |
| †NFE                           | -            | -       | 1         | 16         | 17 (12.4) |
| Primary                        | -            | -       | 1         | 11         | 12 (8.8)  |
| Secondary                      | 2            | 2       | 5         | 51         | 60 (43.8) |
| Tertiary                       | 1            | 2       | 9         | 36         | 48 (35.0) |
| Total (%)                      | 3 (2.2)      | 4 (2.9) | 16 (11.7) | 114 (83.2) | 137 (100) |

†NFE = no formal education, % connotes percentages

Many respondents, 115 (41.1%) based their knowledge of ‘patients’ having OC on sources other than hospital diagnosis (Table 3).

The relationship between the respondents and the ‘patients’ they knew had ocular cancer is as shown in (Table 4). Most respondents 124/148 (83.8%) had no family link with ocular cancer patients (OCP).

*Challenges to accessing orthodox eye care by ocular cancer patients*

The challenges to accessing orthodox eye care services by ophthalmic patients including ones having OC are as shown in Figure 2. The high cost of orthodox eye care services was the most challenging.

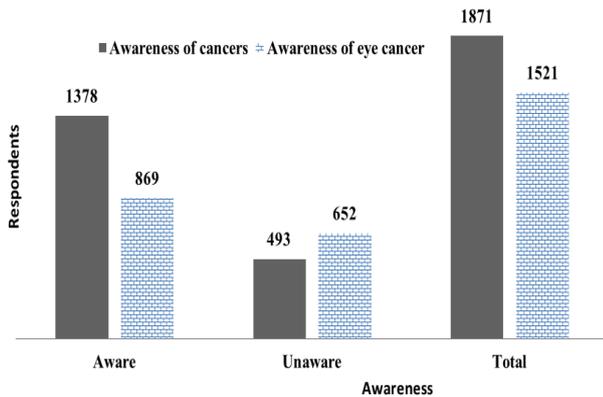
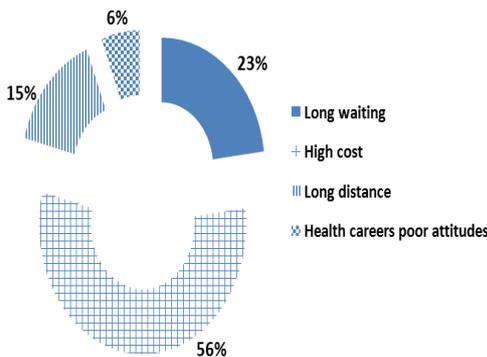


Figure 1: Respondents' awareness of cancers

**Fig. 1** Respondents’ awareness of cancers  
Of 1,887 respondents 1,871 responded to query on awareness of cancers (in general) and 1,378 (73.7%) were affirmative. Also, 1,521 responded to query on awareness of ocular cancers and 869 (57.1%) were affirmative.



**Fig. 2** Challenges to accessing orthodox eye care services, n=202

**Discussion**

This study is on awareness and knowledge of ocular cancers (OC) in a resource-limited economy, Nigeria as a reference community. Nigeria is a sub-Saharan African country with over 140 million people [12], the Gross Domestic Product per capital is USD 1,128 and 60% of Nigerians are below poverty line, earning less than USD1 per day [13]. The study was conducted in Abuja, a Nigerian federal capital city where all Nigerian ethnic nationalities are represented.

The demographics revealed adult age groups mostly between 21 and 50 years. The children were deliberately excluded in view of the interest of this study. The respondents’ main vocations were public service, trading and schooling. The commonest vocation was schooling while the commonest marital status being single. Gender had no association with awareness of cancers in this study, the male preponderance notwithstanding. There was high literacy among the study population as; 90.6% had at least primary education. This was not unexpected as the respondents were Nigerians in Nigeria federal capital city.

This study should be representative of awareness and knowledge of Nigerians on OC. This was so as the catchment population was representative; more than one hundred ethnic groupings of Nigeria were interviewed. Moreover, the gender distribution appeared balanced, slight male preponderance notwithstanding.

Remarkably, fewer respondents were aware of eye cancers (57.1%) compared to cancers in general (73.7%) and this difference was significant ( $P < .001$ ). This underscored the study in view of the implications of cancers in any organ. There is disproportionate public enlightenment program and financing of activities in favor of cancers involving other parts of the body especially breasts, prostate, lungs, liver among others. The sheer differential in the magnitude of mortality from various cancers especially the aforementioned cancers notwithstanding, public awareness should be intensified in all cancers as the best management for all is prevention and/or early detection and treatment.

Similar to many previous studies indicating positive influence of education on awareness of health conditions [14-16], education was significantly associated with awareness of OC ( $P < .001$ ) in particular and of cancers in general ( $P < .001$ ) in this study.

On the other hand, this study brought to fore the age long misconceptions on OC. Some respondents attributed the cause of OC to witchcraft and trauma. There is no scientific proof of witchcraft causing OC. On the other hand, there is no direct causal relationship between trauma and cancers, despite the Koebner phenomenon. Also, the role of corrosives in OC is uncertain. These misconceptions need to be corrected through public enlightenment campaigns as negative beliefs can lead to negative attitudes and even practice.

The causes of OC are known and have been variously documented [17-20]. For instance, retinoblastoma has genetic basis [17]. Chronic exposure to ultraviolet radiation (sunlight) is a risk factor for squamous carcinoma of the lids (18), and radiation therapy in retinoblastoma can induce second cancers [19, 20]. Moreover, Kaposi sarcoma virus (KSV) (Human Herpesvirus 8 (HHV-8)) is implicated in conjunctival or eyelid kaposi sarcoma [18] and is aggravated by Human immunodeficiency virus (HIV) infection.

The public sources of information about OC are not necessarily correct. We found that more than 40% of 280 respondents based their knowledge of eye cancer 'patients' on sources other than hospital diagnosis. Furthermore, it was revealing that some respondents based their knowledge on suspicion. This was not a surprise as over 90% of patients were distant family members and non-family relations which respondents might not actually have had contact with.

The challenges to accessing orthodox eye care services by ophthalmic patients including those having eye cancers have been referred to as barriers to eye care services in many reports [21-23] and are serious hindrances to accessing eye care services in resource limited-economies. Among these challenges, high cost of eye care [2] was the most identified challenge to accessing eye care services in this study. Health care workers should have positive attitude to patients care to avoid being barriers to patients' uptake of health care services [22, 23]. Patients are the reason for health care profession and they deserve health care with sympathy and empathy.

## Conclusion

In conclusion, the awareness of OC lags behind awareness of other cancers. Education enhances awareness of cancers including OC among the population. Misconceptions on causes of OC deserving correction exist in the population and societal diagnosis of OC may not necessarily be hospital based. Public health education on OC would enhance awareness. Also, there is urgent need to address the identified barriers to accessing eye care in resource-limited economies particularly, Nigeria.

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