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Access to and Utilization of eye Care Services in Ghana

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Abstract

Purpose: Available evidence suggests widespread ocular problems in Ghana, including more than 200,000 cases of blindness in a country of 20 million, which is about the highest rate in any African country. The purpose of this study was to investigate the adequacy of access to and utilization of eye care services in Ghana.
Methods: A survey involving 600 consumers (aged 18 to 80 years, mean 38 years ± 13.6) recruited from a stratified random sample of food markets in the Cape Coast metropolis was carried out using questionnaire. Health status, eye care usage behavior, and socio-demographic data were collected in a structured interview of the participants. Utilization of eye care services was also measured among 10 ophthalmologists, 10 optometrists, and 10 ophthalmic nurses registered to practice in Ghana by comparing the frequency of eye examinations with professional practice guidelines. Access to eye care services was determined for the eye care providers to population ratio by geographical region.
Results: Approximately 68% of the consumer sample had never received an eye examination and only 17% reported having an eye examination at least once in 3 years. The eye care provider to population ratio for ophthalmologists and optometrists was 1:377,661 and 1:324,552 respectively.
Conclusion: Access to and utilization of eye care services in Ghana are grossly inadequate. Insufficient eye care personnel and massive imbalance in the distribution of eye care services in the country are the major problems.

Keywords: Access, eye care services, Optometrists, Ophthalmologists, Ophthalmic nurse.

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Introduction

Although Ghana has been successful in achieving satisfactory indices in basic indicators of health, its impressive health statistics does not seem to extend to eye health services. Although infant mortality declined over the past 15 years (falling from 64 per 1000 births in 2000 to 50 per 1000 births in 2010) and rate of overall life expectancy increased from an average of 58 years in 2003 to 60 years in 2010[1], over 200,000 (1% of Ghana's population) are blind[2]. This rate has not shown any significant change in recent years even though over 75% of these cases are treatable. Furthermore, available evidence shows a trend of increase in rates of visual impairment and blindness in some parts of Ghana. For example, the prevalence of blindness reported in the Brong Ahafo region of Ghana in the early 1991s was 1.7%. [3] A later study in the Volta region in the year 2000 indicated a prevalence of 4.4%.[4]

As visual impairment can negatively impact on every aspect of life of an individual, the World Health Organization (WHO) and the International Agency for the Prevention of Blindness (IAPB) (with an international membership of Non-Governmental Organizations (NGO), professional associations and eye care institutions) have developed a global initiative for the elimination of avoidable blindness by the year 2020 called "Vision 2020: The Right to Sight".[5]

In Ghana, eye care is currently largely institution based and run by Ophthalmologists, Optometrists and Ophthalmic nurses in big cities and towns with general practitioners and pharmacist providing some primary care and referring when necessary. Ophthalmology services are mainly available in tertiary hospitals and in few private practices where National Health Insurance Scheme (NHS) that is available to all Ghanaians covers the fees.

One of the key factors in achieving the goals of Vision 2020 is access to and utilization of eye care services [6]. However, there is an assertion that the wide spread ocular problems in the country is related to lack of access to and underutilization of eye care services. To test this assertion, this study was undertaken to determine the adequacy of access to and utilization of eye care services in Ghana, based on recommended standards.

Methods

Study Design

Following ethical approval sought from the institutional review board of the University of Cape Coast, Ghana, two data collection strategies were employed in this study namely Eye care Provider and Market Surveys .

Market survey: Of the 10 regions in Ghana, the central region (with Cape Town as capital) was chosen for this study based on convenience. The region has a population of 1,559,248 and comprises of communities with contrasting environmental conditions and people of different socio-economic status.[7] There are three major market areas in the Cape Coast metropolis where food stuffs and other commodities are sold to the general public. These are Kotokuraba, Tantri and Abura markets. Two clusters were formed at each market and 100 subjects equally divided between male and female were selected from each cluster. At each cluster, interviews were carried out using every third man and every third woman who run a shop in the market. If the third man or third woman was missed because the person did not open or run the shop or if a person refused to participate, then the next man or woman was chosen. All those who were hawking or shopping at the time of the research were not included in this study as they were not running their own shops. The eligible age for participation was 18 years and older. Overall 600 market men and women were enrolled in the study.

At each site, surveys were conducted between 9.00am to3.00pm daily from Monday to Friday. The interview sought information concerning rates and patterns of utilization of eye care services, accessibility of eye care services, barriers to seeking eye care services, frequency of eye examination, consumer satisfaction with eye care received, ocular health problems, and self-reported need for eye care. All data collected were recorded in previously designed and validated format.

Eye care providers' survey: A register of all persons qualified to practice ophthalmology, optometry and ophthalmic nursing in Ghana and their practice locations was obtained from the respective professional organizations. Telephone calls were made to obtain consent. All selected eye care providers agreed to participate in the study. A 60-question survey questionnaire (pre-tested) was self administered to each participant. The questionnaire sought information on level of training and duration of practice, number of patience seen per week and cost charged for each eye examination.

Measures of Adequacy

Vision 2020 recommended the following minimum standards in a geographical area of a nation for access to eye care services to be considered adequate: 1 Ophthalmologist per 50,000 people; 1 Optometrist per 250,000 people;

1 Ophthalmic nurse per 100,000.[5] We used data from the Ghana Optometric Association (GOA), the Ophthalmological society of Ghana and the Ghana Ophthalmic nurses association, to determine the supply and location of eye care providers. Based on this information, an eye care provider to population ratio for each region was calculated and compared with the WHO recommended standard. To determine the level of utilization of eye care services, we used the frequency with which the majority of people uptake eye care services. Based on the American Optometric Association (AOA) recommended guidelines,[8,9] if at least 50% of the population had received eye examinations within the last 3 years, then utilization was considered adequate. Information on frequency of eye examinations was obtained from the population survey.

Data analysis

All data were collected using structured pre-tested interview schedules and descriptive analyses were performed using the Statistical Package for Social Sciences (SPSS) to generate frequencies and proportions. Proportional data were compared as appropriate using Chi-square test. At 95% confidence interval, p-values <0.05 were considered to be significant.

Results

The consumer sample (n=600) was equally divided between men and women aged 18 to 80 years, mean age 38 years ± 13.6. There was no statistically difference between mean ages of the males and females (P=0.277). Table 1 shows the socio-demographic characteristics and eye care usage pattern of the consumer sample.

Table 1: Demographic characteristics and eye care usage behavior of the Market subjects (n = 600)

Characteristics		Total (%)
Age Range (M:F)	18-76:18-80	18-80 years
Mean Age (M:F)	37.10:38.89	37.99 years
Ever had Eye exam	193 (32.2)	
Frequency of first eye exam (n=193)		
3 months – 10 years	34 (17.7)	
10 – 20 years	43 (22.4)	
20 years and above	106 (55.2)	
Others	10 (5.2)	
Last Eye Exam (n=600)		
Never	407 (67.8)	
< year	56 (9.3)	
1-2 years	28 (4.7)	
2-3 years	18 (3.0)	
3-5 years	28 (4.7)	
>5 years and above	63 (10.5)	
Type of Eye Care Provider Seen (n=193)		
Ophthalmologist	66 (34.4)	
Optometrist	31 (16.1)	
Ophthalmic nurse	53 (27.6)	
General Practitioner	6 (3.1)	
Don't know	37 (19.2)	
Eye Problems (n=600)		
Vision	64 (10.7)	
Ocular health	98 (16.3)	
Both	18 (3)	
'Others'	13 (2.17)	

Table 2: Barriers to seeking eye care services among the market subjects

Reason	Among those who had eye exams (n=193) (%)	Among those who have never had eye exams (n=407)
Distance	15 (7.8)	56 (13.8)
Cost	40 (20.7)	131 (32.2)
Time	46 (23.8)	61 (15.0)
Not serious enough	30 (15.5)	84 (20.6)
Appointment Difficulty	11 (5.7)	45 (11.1)
Fear	17 (8.8)	11 (2.7)
Others	11 (5.7)	9 (2.2)
None	23 (11.9)	10 (2.5)

Percentages given in parenthesis

Table 3: Consumer (Market subjects) satisfaction with eye care services received

Satisfaction	Optometrist	Ophthalmologist	Ophthalmic nurse	Total
4-5	19 (63.3%)	33 (53.4%)	20 (37.7%)	72 (49.3%)
Less than 4	11 (36.7%)	30 (46.6%)	33 (62.3%)	74 (50.7%)

Based on a scale of 1-5, where 5 =most satisfied and 1= least satisfied

Frequency of Eye Exams

Only 193 (32.2%) of the consumer sample reported having at least one eye examination in their life time. Majority (67.8%) had never had an eye examination. Of those who had an eye exam, 19.2% were unable to identify whether they had received their care from an ophthalmologist, optometrist, ophthalmic nurse or a general practitioner. Of those who could identify their eye care provider (n=156), Ophthalmologists provided approximately 34.4% of the eye care, Optometrist 16%, Ophthalmic nurse 27.5% and general practitioners 16.1%. In terms of the frequency with which they receive eye care, the survey showed that only 102 (17%) had their last eye examination within the recommended interval of 3 years. A total of 83% of the participants had not received an eye examination within this recommended interval.

One hundred and ninety-three persons, or 32%, reported presently or previously having ocular or vision problems. This included 64 persons (10.7%) who reported vision problems, 98 persons (16.3%) who reported ocular health problems, and 18 persons (3%) who reported both vision and ocular health problems. The 'Other' category includes those who could not describe the nature of their problem.

Barriers to Seeking Eye Care

Cost (32.2%) emerged as a major barrier to seeking eye care for those who have never had an eye exam while waiting time (23.8%) was the main hindrance to seeking eye exam for those accessing eye care services (Table 2). Some of the participants (20.6%) noted that they did not see the need to go for eye examinations because the eye conditions did not cause any discomfort. For those who have accessed eye care services, when we examined their satisfaction levels (Table 3), 72 (%) reported a satisfaction level of 4 to 5 (highly satisfied) with their eye examination (on scale of 1 to 5, where 5 was most satisfied and 1 was least satisfied).

Eye Care Providers' Survey

Available data from the respective professional organizations at the time of this report showed that there were 55 practicing Ophthalmologists, 64 practicing Optometrists and 216 practicing Ophthalmic nurses in the country. Thirty eye care providers (13 males and 17 females) of mean age: 41.2 ± 6.4 years (Table 4) participated in the

Table 4: Demographic characteristics of the eye care providers

Characteristics	Male	Female	Total
Age (Range)	28-45	34-55	28-55
Mean Age	38.55	43.82	41.18
Standard deviation	5.716	6.162	6.397
Number	13 (43.4%)	17 (56.7%)	100

Table 5: Practice locations and types of practice of the eye care providers

Practice Location	(n) (%)	Types of Practice	(n) (%)
Urban	23 (76.7)	Public	15 (50.0)
Rural	5 (16.7)	Private	3 (10.0)
Both	2 (6.7)	NGO	2 (6.7)
		Mission	5 (16.7)
		Public and Private	4 (13.3)
		Public and Mission	1 (3.3)

Table 6: Eye care providers' characteristics

Variable Measured	Ophthalmologists (n=10)	Optometrists (n=10)	Ophthalmic nurse (n=10)
Cost in Ghana Cedi			
Mean cost of exam	13.88	9.2	6.9
Range	6.00 -30.00	8.00-10.00	5.00-9.50
Standard Deviation	1.09	0.96	2.41
Patients Seen per Week			
Mean	95	115	172
Range	15-250	60-180	100 – 400
Standard Deviation	80	39.3	92.5
Education / Training			
MBBS	0	0	0
PGD in Optometry	0	2 (20)	0
OD	0	8 (80)	0
ON	0	0	10 (100)
Post Graduate Residencies	10 (100)	0	0
Years of Practice			
Mean	4.70	6.89	9.70
Range	2-18	1-12	2-27
Standard Deviation	5.012	3.92	7.056

Percentages are in parenthesis. MMBS: Bachelor of Medicine and Surgery; PGD: Post graduate diploma; OD: Doctor of Optometry; ON: Ophthalmic Nurse.

study. Majority of the eye care providers are in urban based practices 23 (76.7%) and consult from government or public hospitals 15 (50%), with only few 5 (16.7%) serving the rural areas hence knowledge of their services is limited. The demographic characteristics, practice locations and types of practice of the provider sample are shown in Table 5.

The cost of rendering eye care service and the mean times in days for earliest available appointment for the eye care providers are shown in Table 6. The costs of a general eye exam, given in Ghanaian cedi show that routine eye examination by Ophthalmologists cost more than routine eye exams by Optometrists (P=0.01).

Table 7: Distribution of eye care providers in Ghana by category per region

Region	Population	Ophthalmologists	Optometrists	Ophthalmic Nurses
Eastern	2,079,483	6(1:346,581)	2(1:1,039,742)	22
G. Accra	3,451,887	30(1:115,063)	33(1:104,603)	55
Western	2,186,539	3 (1:728,846)	3(1:728,846)	1
Central	1,559,248	1 (1:1,559,248)	3(1:519,749)	17
Volta	1,763,300	1 (1:1,763,300)	1(1:1,763,300)	18
Ashanti	4,115,881	7 (1:587,983)	18(1:228,660)	30
Brong Ahafo	2,003,892	4 (1:500,983)	2(1:1,001,946)	21
Northern	2.033,464	2 (1: 1,016,732)	1(1:2,033,464)	12
Upper East	961,247	0	1(961,247)	21
Upper West	616,441	1(1:616,441)	1(1:616,441)	12
National	20,771,382	55(1:377,661)	64(1:324,552)	216

Source: *GSS 2000 census (projection)[7]; Ratio of eye care provider to population is in parenthesis*

Further, Ophthalmic nurses see more patients per day than Optometrists (P=0.027).

Measure of Accessibility of Eye Care Providers

An eye care provider to population ratio by geographical region was also calculated (Table 7). All the regions are served by at least an eye care provider. However, the Greater Accra and the Ashanti (both metropolitan areas) regions are served by 51% of the eye care providers in Ghana, with the remainder scattered throughout the rest of the country. Our calculations show that only the Greater Accra region met the WHO recommended standard of 1 eye care provider to 250,000 people for optometrists and ophthalmologists respectively. A critical shortage of eye care providers was observed in the Northern region with an eye care provider to population ratio of about 1:1 million and 1:2 million people for Ophthalmologists and Optometrists respectively, followed by the Volta region with an Ophthalmologist or Optometrist to population ratio of 1:1,763,300 people.

Discussion

Based on the American Optometric Association (AOA) recommended guidelines,[8,9] if at least 50% of the population had received eye examinations within the last 3 years, then level of utilization will be considered adequate. In this study, it was observed that only 102 (17%) of the people met the recommended frequency of eye examination. When we consider that some of the people among this group received their eye care from inappropriate sources then we see that fewer than the 17% who received eye care within 3 years actually received quality and comprehensive eye examination. Given that the eye care provider to population ratio in majority of the regions falls short of the recommended WHO standard, the hypothesis that access to and utilization of eye care services in Ghana is inadequate is substantiated. Not only is there a shortage of eye care providers, but also their distribution is disproportional to that of the population. Similar to findings in this study, severe inadequate utilization of eye care services compounded by poor distribution of eye care providers have been reported in Jamaica [11] and South Africa[12]. Poor utilization is of great concern because if the time interval between eye examination is high, certain avoidable or curable ocular conditions will cause irreversible visual loss or blindness.[13] Cox (2002)[14] suggested the need to overcome underutilization of existing eye care services by addressing local barriers to uptake through community participation in eye screening, education and affirmative action. Special efforts are needed to target persons, living in the rural areas, and persons who are poorly educated. The need for community education was further highlighted by the observation that 19% of those who have accessed eye care services did not know the difference between an Optometrist and Ophthalmologist. By virtue of their respective evolutions, training, and cultures, these eye care professions address eye care needs with varying degrees of competence and expertise. In general, optometry's strength lie in addressing

ambulatory eye and vision anomalies and vision rehabilitation, whereas Ophthalmologists receive highly specialized training in surgical procedures. A rational use of eye care personnel, in keeping with the Vision 2020 policies, would make use of the training and skills of Optometrists and address the problem of unbearable volumes of patients for the Ophthalmologists and Ophthalmic nurses. This becomes apparent with the observation that waiting time was the major hindrance to using eye care services among those who have had an eye examination in this study. To promote efficiency, cost containment and patients' access to the total spectrum of eye and vision services, Vision 2020 emphasizes the need for an integration of the two professions into functional coalitions.

The total eye care provider to population ratio was 1:174,549 and falls to 1:377,661 when Optometrists were excluded. Majority of data[15, 16] in developing countries suggest this pattern. Poor access to eye care services have been identified as important causes of the high prevalence of blinding eye diseases[17.] According to Di Stefano, [18] the lack of access to eye care services globally is a critical barrier to the successful elimination of avoidable blindness as proposed by Vision 2020. People need access to preventive services that are effective in the prevention of disease or in the detection of asymptomatic diseases or risk factors at early, treatable stage.[18] This has resulted in the high prevalence of use of alternative sources of care including traditional healers and patent medicine sellers, who serve as frontline health workers.[19] Issues relating to poor access to eye care services are not peculiar to developing countries. In a study in Melbourne, Australia, O'Connor et al[20] reported that poor access to eye care services was a major barrier to utilization of low vision services. Also, Gold et al[21] reported that more than 5% of the USA population reported unmet need for eye glasses, presumably due to poor access.

Cost emerged as a major barrier to utilizing existing eye care services. Several studies[16,22] in developing countries have documented monetary costs to be a major barrier to uptake of eye care services. In many developing countries, poverty is a major issue hence residents are not able to afford the cost of eye care services and therefore conditions which could have been treated at an early stage are not attended to and may result in low vision and blindness.[23] Nedgwa et al [16] reported that cost was one of the main barriers to eye care use in Kenya, and in Gambia, the most frequently identified barrier to uptake of cataract surgery was cost.[21] Cost is therefore one of the main barrier to eye care utilization in developing countries. Prevention of blindness should involve a service approach rather than a profit oriented approach. Good financial management and subsidies to assist people in rural and poor areas who cannot afford the cost of eye care in Ghana will help in this direction.

Approximately half of the respondents in this study had high or very high satisfaction with their last exam. Further, all thirty eye care practitioners interviewed in this study have attained terminal degrees in their respective disciplines, thus, highlighting the fact that the eye care providers in Ghana are well-trained to render eye care service. Consumer satisfaction is an important factor in sustaining utilization of heath care and it has been reported that dissatisfaction with services rendered is a major barrier to eye care utilization.[23, 24] Therefore, in addition to an increasing access, there needs to be an improvement in intervention and service quality, to facilitate equitable, acceptable and effective eye care to achieve the goals of Vision 2020. The development, implementation and monitoring of standards of care and treatment/clinical guidelines is one mechanism by which this may be achieved[13].

The results of this study were weakened by the non-random selection of the target population. Eye disease prevalence in Ghana is spotty and concentrated in three of the country's 10 administrative regions: the Northern, Upper East and Upper West Regions. It is possible that we have underestimated the proportions of the problem in our Cape Coast study population. Furthermore, clusters were chosen empirically in each market and individuals were chosen starting at a central point and selecting every third person. Since these are non-random methods, it weakens our data. Nevertheless, since there was no bias to select one person over another, and since the

population of market traders in Ghana appears homogenous, we believe our results are probably generalizable.

This study has helped to identify the adequacy of access to and utilization of eye care services in Ghana. Our findings quite clearly suggest that the total eye care provider to population ratio in Ghana is grossly inadequate by WHO standards and the distribution of eye care providers is disproportionate to the population. Access to eye care is impeded by both insufficient levels of supply as well as massive imbalance in distribution of eye care services. If avoidable blindness in Ghana has to be eliminated, as proposed by the global initiative Vision 2020, specific interventions such as community education, government organized eye care promotions, functional coalitions for effective eye care team performance and rational distribution of eye care providers would have to be effectively targeted. Subsequently, factors like cost and waiting time for eye examinations that act as barriers to utilizing eye care services must be identified and addressed.

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Conflict of Interest

There is no conflict of interest associated with this article.

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