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An Audit to Compare the Availability and Distribution of Human Resources for Eye Care in Orlu and Owerri Metropolis in South-Eastern Nigeria Using Vision 2020 Standards as Benchmarks and Literature Review

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ABSTRACT

AIM: The purpose of this study was to compare the availability and distribution of the various cadres of eye care workforce in Orlu, a sub-urban setting and Owerri metropolis, an urban setting in Imo State, in South Eastern Nigeria, using Vision 2020 standards as benchmarks with Literature review.

Methodology: Two areas in Imo State, namely Orlu and Owerri metropolis were used in this study. This was both a quantitative and qualitative cross-sectional survey. The quantitative data was assessed by distributing interviewer-administered questionnaires to the different categories of eye care workers (ECWs) in the various public health care facilities used in the study. The questionnaires contained sub-sections on the subjects' sex, age, religion, marital status, level of education, years in service, location of residence, and training in eye care. The qualitative research covered training in eye careappropriateness to job postings as well as sponsorship to updates and workshops/refresher courses by the various cadres of eye care workers in the health care facilities under study, using focus group discussions (FGDs) and in-depth interviews (IDIs) .The qualitative interviews of the participants covered the state of study, the study area, type of health facility, sex, type of interview and the category of eye care worker (ECW) and the serial number of the interviewed participant.

Results: The results of the study showed that the eye care workers (n=271) working in 28 public health care Institutions included 45(16.6%) males and 226(83.4%) females with age range of 20-65years, and modal age range of 30-39years, with a mean age of 42.23±11.0 S.D. years. A large proportion 216(79.7%) of ECWs were married and most 206(76.0%) of the workers had tertiary education. A large proportion 170(62.7%) of the ECWs live in Owerri and the same number(62.7%) also work in Owerri, and 102(37.6%)were integrated eye care workers(IECWs). The qualitative survey also showed that some of the workers were not appropriately posted to their areas of specialization, not trained in eye care and were not sponsored to updates, workshops/ refresher courses and seminars.

Conclusion: The results of the study showed a skewed distribution of ophthalmic nurses, optometrists and ophthalmologists in favour of the urban, Owerri . However, the eye care personnel to population ratio could not be fully ascertained in this study due to non-contribution from privately-owned clinics which were not included in this study. The obvious health care manpower mal-distribution gap could be urgently addressed through adequate provision of social amenities like safe water/electricity, recreational facilities, establishment of industrial estates in Orlu and other rural areas Imo State to generate employment opportunities to minimize the prevailing rural-urban drift of health care manpower. Training of eye health personnel (human resource development), one of the key goals of Vision 2020 was not met, but can be improved through re-training and in-service training with motivations and inducements in form of sponsorships to updates, workshops and refresher courses. Additionally, the integration of primary eye care into the health care system of the state will go a long way in closing the existing health care gaps and by extension, the socio-economic gaps that exist between the more economically endowed Owerri and the rural population in Orlu, as it is popularly said that "health is wealth".

KEY WORDS: Clinical Audit, Quantitative, Qualitative, Availability, Distribution, Human Resources, Vision 2020, Eye care workers.

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INTRODUCTION

One of the key pre-requisites for achieving the objectives of Vision 2020 is the training, recruitment and retention of the appropriate mix of adequately-trained and well motivated eye care workforce[1]. Human resource development, disease control and appropriate technology are the three pillars of Vision 2020[2].

Especially in Low- and Middle- income countries (LMICs), where about 90% of the world's blind and visually-disabled people live, workforce-related issues, constitute critical barriers to the delivery of comprehensive eye care services. Consequently, in the LMICs, there is urgent need for eye care man power to plan, implement, monitor and evaluate the eye care programmes at the community, regional, sub-national and national levels[2]. Additionally, in the LMICs, the pro-urban spatial mal-distribution of available eye care manpower constitute further impediment to the delivery of eye care services to the general population [2, 3]

To address these manpower-related issues, WHO, in the year 1997, recommended that for the Vision 2020 targets to be achievable, it was necessary that by the year 2000, Sub-Saharan Africa should have the eye care personnel-to-population ratios of: one ophthalmologist per 500,000 people; one dispensing optician or optometrist per 500,000 people; one cataract surgeon/diplomate ophthalmologist per 250,000; one ophthalmic medical assistant or ophthalmic nurse per 500,000 people and one primary eye care trainer per one million population [4]. Whether this benchmark by WHO has been met, is a question this research work is meant to answer.

Hence, a Clinical audit to evaluate the status quo with a view to generating evidence-based data using Vision 2020 standards as benchmarks became inevitable. Health care audit is defined as a quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change [5,6]. A key component of clinical audit is that performance is reviewed to ensure that what should be done is being done, and if not, it provides a framework to enable improvements to be made.[6] Clinical audit differs from Medical audit because clinical audit is a broad term used when health care professionals and non-professionals are involved while medical audit is used when audit is conducted for doctors[5]. Clinical audit can be described as a method for systematically reflecting on and reviewing practice [5] . Yeltsin and Wormald [7] hold the view that auditing is not about policing and pointing the finger when things go wrong ; it is trying to learn from what one is currently doing and, where appropriate, improve on it. Clinical audit forms part of the clinical governance umbrella and clinical governance has been used as a system through which the National Health Service (NHS) organizations maintain continuous improvement of quality of services and ensure that there are clearly defined lines of accountability and comprehensive programme for quality improvement. [1]

Eye care worker has been classified into different categories by different authors. Waife[8] , grouped eye care manpower into three different categories which include : 1)**Full time eye carew orkers** (**FTECWs**)viz- ophthalmologists, optometrists, ophthalmic clinicians, ophthalmic nurses and optical technician. 2) **Integrated eye care workers** (**IECWs**): These include workers who, although are not specifically trained in delivery of eye care services, are involved in the treatment of eye patients as part of their daily working activities. They include general medical practitioners, clinical officers, general-duty nurses, midwives and environmental health technicians. 3). **Community eye care workers**: This category of eye care workers are those that come in close contact with the community in the course of their normal duties., frequently at the village level. These include community health workers (CHWs), traditional birth attendants (TBAs), community-based rehabilitation worker(CBRW) and volunteers including traditional healers. Other non-medical personnel in this category, who contribute and participate in enhancing blindness prevention activities and include School teachers, Churches and Mosques/religious leaders, agricultural extension officers, Water department officers, Village headmen and Social welfare officers.[8]

Also,Usher[9], while contributing to the proceedings of the 8th General Assembly of the International Association for the Prevention of Blindness (IAPB),remarked that there is still a great need for eye health personnel in most countries; he further observed that the causes of this human resource crunch vary world-wide, from a dearth of people suitable for training to high levels of emigration of trained personnels. However, Newton et al [10] in a study on South American Blindness Prevention Programme with Brazil in focus, reported that the number of ophthalmologists seems to be appropriate, about 8,000 for a population of 160 million, although there are few ophthalmic technicians and other allied eye care personnel.

Beyond scarcity, the mal-distribution of available eye care personnel in favour of urban areas constitute another major impediment to population-wide eye care delivery. This mal-distribution, has been reported in India [11] ,Cambodia [12], Kenya [13] and in Enugu, Nigeria [3] . Furthermore, the available eye care personnel in the cities tend to self-select themselves into private sector jobs where

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remunerations are higher. These anomalies on the availability and distribution of eye care workforce observed in different climes globally, forms the basis of this study with the study areas as the foci of interest in this particular study.

MATERIALS AND METHODS

Study Area

The study covered two areas in Imo state, Orlu in Orlu Senatorial Zone and Owerri Metropolis in Imo West Senatorial Zone. Imo State was created in 1976, out of the former East Central State of Nigeria, with her administrative capital in Owerri. Imo State, along with the other sister states of Anambra, Abia, Enugu and Ebonyi make up Nigeria's South- East geo-political Zone. Owerri is the only metropolitan city in Imo State, while Orlu and Okigwe are rapidly transiting to urban status. Owerri and Orlu are located in the same climatic zone in Imo state in the tropical rain forest belt covering an area of 100 square kilometers[14] and projected populations of 400,000 and 220,000 respectively according to 2006 national population census in Nigeria[15]

Research Design:

The study was a descriptive, cross-sectional survey (quantitative and qualitative) of all the eye care workers (ECWs) in 28 existing public (government-owned) health care institutions in Orlu and Owerri metropolis offering eye care services and was carried out over a 6-month period.

Inclusion Criteria:

The eye care workers involved in this study were strictly between the ages of 20 to 69 years. All public health care institutions(government-owned health care facilities) that offer eye care services in the study areas and the eye care workers (ECWs) who were willing to give information were included in the study.

Exclusion Criteria:

All health care facilities that are not owned by government in the study areas, including private-owned hospitals/clinics , mission hospitals, non-governmental organizations(NGOs)-owned clinics together with their eye care workers(ECWs) were excluded from this study Public (government-owned) health care institutions who are unwilling to give information were excluded from this study.

Ethical Considerations:

Ethical clearance was obtained from the Medical and Health Research Ethics Committee (the Institutional Review Board) of the University of Nigeria Teaching Hospital, Ituku Ozalla, Enugu, in Enugu State, Nigeria. A photocopy of the Ethical Clearance certificate was submitted to the Ministry of Health, Owerri, Imo State who gave the permission for the research to be carried out at the various health care facilities in the areas under study. The stamped-list of all the public health care institutions (government-owned health care facilities) and the health maps of the study areas released to the research team by officials of the Ministry of Health, Owerri, together with the Ethical Clearance certificate and the informed consent form were shown to the various institutions visited.

Methodology:

Data Collection

The data collection, which involved both the quantitative and qualitative data, was undertaken by the research team. The research instruments used for the data collection This This included a structured interviewer-administered questionnaire for the Quantitative research and Focus group discussion (FGD) guide and In-depth interview ((IDIs)guide and were used to assess the human resources for eye care on the basis of training in eye care, appropriateness to job postings and sponsorship to updates, workshops and refresher courses.. The quantitative data was obtained by filling the questionnaires by the research following direct questions on the contents of the questionnaires. The collection of the qualitative data was obtained by the research team using the FGDs and IDIs as the research instruments. The Reviewed, Richard Krueger's FGDs guide was modified for the purpose of this study and used as templates for the discussions and interviews.[16] The principal researcher coordinated all aspects of the qualitative study while a sociologist played the role of a moderator during the FGDs/IDIs. My research colleagues did the note-taking/jotting and recording of the discussions and interviews.

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Statistical Analysis

The quantitative data collected were cleaned, coded and double-entered into the computer to ensure accuracy. Analysis was carried out using the Statistical Package for the Social Sciences (SPSS0, version 20 (SPSS Inc, Chicago, Illinois, USA). Data were thus categorized and, descriptive as well as analytical statistics used to generate frequencies, percentages and proportions. The results were presented in tables and proses. The qualitative data obtained from the focus group discussions (FGDs) and in-depth interviews (IDIs) were completely transcribed haven carefully compared the notes and the recorded speeches. The transcribed data was subjected to analysis using ATLAS.ti Version 6.0 computer software, for quick and accurate analysis. The themes/codes were carefully cross-checked as the computer analysis progressed.

Working Definitions:

Eye care worker(ECW): An employee of Imo State government working in any of the 28 public health care facilities under study.
Registered Nurse(General duty nurse): Any nurse with basic nursing certificate and registered with the Nursing/Midwifery Council of Nigeria who has not undergone a post-basic training in other areas of nursing.
Community health worker: A health worker that is trained as a community health extension worker and working in a primary health care facility.
Ophthalmic nurse: A registered nurse who has undergone post-basic training in an ophthalmic unit and thus certified.
Integrated eye care worker: This include all the workers in a health care facility who was not trained in eye care and did not fall into any of the categories of eye care workers used in the study.
Optometrist: A health worker with certificate in optometry and working in any of the health facilities visited by the research team.
Resident doctor in ophthalmology: A medical doctor who has been in training in an ophthalmic unit for at least, one year and working in any of the tertiary health care facilities under study.
Ophthalmologist: Any medical doctor with a fellowship certificate in ophthalmology and working in any of the areas under study.
Primary eye care trainer: Any health care personnel who had undergone some basic in eye care to enable him/her train others in primary eye care.
Diplomate-ophthalmologist: A medical doctor with diploma in ophthalmology.
Optical technician: An eye care personnel trained in cutting and dispensing of lenses.

RESULTS

Table 1: Age and Sex distribution of 271 ECWs

Age (Years)	Sex		Total (%), n= 271
	Male: n(%)	Female: n(%)	
20-29	4(8.9)	16(7.1)	20(7.4)
30-39	17(37.8)	106(46.9)	123(45.4)
40-49	13(28.9)	90(39.8)	103(38.0)
N50-59	11(24.4)	13(5.8)	24(8.9)
60-69	0(0.0)	1(0.4)	1(0.3)
TOTAL	45(100)	226(100)	271(100)

Table 1. shows the Age and Sex distribution of the eye care workers. Two hundred and twenty six (83.4%) ECWs were females while forty five (!6.6 %) were males giving male to female ratio(M:F)=1.5. Age distribution ranged from 20-69 years with a mean age of 42.2 +_11.0 S.D. years and modal age range of 30-39years. (Table 1).

Table 2: Socio-demographic characteristics of ECWs

Characteristics		Frequency	Percentage (%)
Marital Status	Single	55	20.3
	Married	216	79.7
Level of	Primary	2	0.7
Education	Secondary	63	23.2

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	Tertiary	206	76.0
Years of Service	< 2	22	8.1
(years)	2-10	169	62.4
	11-20	69	25.5
	21-30	9	3.3
	31-35	2	0.8
Location of Service	Within Orlu	84	31.0
	Within Owerri	170	62.7
	Outside Orlu And Owerri	17	6.3
Category of eye Care worker	Integrated eye care worker	102	37.6
	Registered nurse	51	18.8
	Ophthalmic nurse	18	6.6
	Community health Worker	64	23.6
	Optometrist	13	4.8
	Resident doctor in Ophthalmology	16	5.9
	Ophthalmologist (Fellow)	7	2.6
TOTAL		**No (271)**	**(%)100**

Majority of eye health care workers 216 (79.7) were married while 55 (20.3%) were single.
Majority 206(76.0%)ECWs had tertiary education while only two((0.7%) had primaey education. One hundred and sixty nine(62.4%) ECWs have worked for two to ten years while few 9(3.3%) have for 21-30 years. Majority 170(62.7%)ECWs reside in Owerri , while 84(31.0%) reside in Orlu and a least number 17(6.3%) reside outside Orlu and Owerri. One hundred and two (37.6%) ECWs were integrated eye care workers (IECWs) while minority7(2.6%)ECWs were ophthalmologists.

Table 3: Distribution of the various cadres of eye care workers (ECWs) in Orlu and Owerri metropolis and health facility where they work.

Category of ECW	Location of service	
	Within Orlu N(%) Health facility	Within Owerri N (%) Health facility
Integrated eye care worker	5(4.9) IMSUTH 30(29.7) PHCs	7(4.1) FMCO 50(29.4) SHC facilities 10(5.9) PHCs
Registered nurse	22(21.8) PHCs	18(10.6) SHC facilities 11(6.5) PHCs
Ophthalmic nurse	2(2.0) IMSUTH	15(8.8) FMCO 1(0.6) SPH,Umuguma
Community Health Worker	36(35.6) PHCs	28(16.5) PHCs
Optometrist	2(2.0) IMSUTH	2(1.2) FMCO 2(1.2) AIFCE,HCO 9(5.3) SPH, Umuguma
Resident Doctor In Ophthalmology	2(2.0) IMSUTH	14(8.2) FMCO

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Ophthalmologist (Fellow)	2(2.0)	IMSUTH	4(2.4) FMCO 1(0.6)
Chi-square	31.8		
P	0.001		

Key : (For quantitative data):

AIFCE,HCO	Alvan Ikoku Federal College of Education, Health Centre, Owerri;
FMCO	Federal Medicall Centre, Owerri.
SPH,	Specialist Hospital, Umuguma, Owerri
IMSUTH	Imo State University Teaching Hospital, Orlu
PHCs	Primary health centers in Orlu and Owerri
SHC, facility	Secondary health care facility

Qualitative Results

Training in Eye care, Appropriateness of Job Postings and Sponsorship to updates/ Workshops

1. Training in Eye care:

Participants were asked whether they were trained in eye care and they responded differently as follows:

One participant answered that she was not trained in eye care and hopes to do well if sent on training thus:

'I didn't study the eye; I will like to go for the course if they will sponsor me. I know that I am gifted in it, and will do very well if given the chance. It is just that….eemmm; well, let's watch'.

(I-OR-PHC-F-FGD-RNS-2)

Another participant replied that she was trained as a primary eye care trainer and was ready to teach others thus:

'*I was trained in eye care ; I am a primary eye care trainer. I went for the course when I was working in Ilorin. I will start teaching once the programme takes off here'* (I-OW-PHC-F-FGD-RNS-2).

Some other participants said that all their colleagues in the eye department were trained in eye care, thus:

'*All of us working in our unit are trained ophthalmic nurses; there is no nursing services personnel working with us that has not gone for post-basic training in eye care'.*

(I-OW-TER-F-FGD-OPN-3).

2.Appropriateness of Job Postings:

When participants were asked whether they were appropriately posted to their areas of training, some answered thus:

'I was initially posted to my present unit when I was employed as a specialist ophthalmic nurse and I was very happy and enjoying my job because that was where I belong. Shortly after one year, some staff in other departments left for greener pastures and I'm always posted out of our unit on coverage an relief duties, in most cases, lasting up to three month periods. It is making me to forget what I studied and I …aah' (I-OR-TER-F-IDI-OPN-3).

In a similar manner, a participant at a primary health care facility said that they could be posted out to another health care facility to cover the duties of other staff on leave or on workshops and updates thus:

'In this our work, they keep posting us out, here and there as they wish to. Doctor, you remember that We had met before, in my main office, two weeks ago; I was posted here since then on relief duty .Doc, I can see that you are confused whether I was the same person you met there'.(I-OR-PHC-F-FGD-CHW-4).

Another participant said that he was not appropriately posted, but he is learning very fast, as he learns new things every day and said thus:

'I was not trained in this job; in fact, when I came here seven years ago, it was extremely difficult, but thank God, today I know almost everything and can even ….. In short, I can handle many cases now'.(I-OW-PHC-M-FGD-IEW-1).

Sponsorship to update courses, refresher courses and workshops :

Participants were asked whether they were being sponsored to the above for which they variously answered as below:

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One participant said that she likes workshops/seminars and would always want to attend if she has the resources of time and money whether sponsored or not and said:

'I have been attending workshops and seminars at least, three times every year,; sometimes they sponsor me and at times they don't, but that doesn't bother me whether they do or not. Once I have money and time, I attend' . (I-OR-PHC-F-FGD-RNS-2)

Another participant said that she was always sponsored to seminars/workshops thus:

'They always sponsor us; let's look at it, this is the 9th month of the year and I have gone for seminars and workshops three times this year alone'.(I-OW-PHC-F-FGD-CHW-4).

Another participant said that he had been sponsored only once in several years, that he always sponsor himself just to develop himself thus:

' *I don't talk of sponsorship again……eeemm. For many years now,Iwas refunded only once, and since then, Ihave been going but no refund. I just have to go because that's the only way to develop myself'.*

Key for qualitative data:

The letters and digits were used as codes to represent the extracts from the participants including the state, study area, type of health facility where the participant works, type of data and the category of eye care worker the participant belonged to ease understanding of the information.

This is given below as follows:

-1st digit --Represents the state ,(IMO) annotated as ' I '
-2nd and 3rd digits --Study area ('OR' stands for Orlu and ' OW' for Owerri)
-4th, 5th and 6th digits --Type of health facility(PHC for primary, SEC for secondary and TER Tertiary health care facilities respectively
--7th -- Sex: Male ('M'); Female(' F')
-8 th , 9th and 10th digits -- Type of data (either FGD or IDI)
-11th , 12th and 13th digits -- Category of eye care worker: (IEW stands for integrated eye Care worker, - RNS stands for registered nurse; OPN for Ophthalmic nurse, CHW for Community health worker; OPT for optometrist, RDO –for residen doctor in ophthalmology; OPH for ophthalmologist.
-14th digit -- Serial number of FGD or IDI participant.

DISCUSSION

This study was both a quantitative and qualitative retrospective survey and attempted to examine the availability and distribution of the various cadres of eye care workforce in Orlu and Owerri metropolis in Imo State, South-Eastern Nigeria using Vision 2020 requirements as benchmarks. A coverage of 100% was made possible as a result of cooperation received from the staff of the Ministry of Health, Owerri, Imo State as well as the health workers in all the health care facilities visited during the study. Eze et al[3] in a related study in Enugu, in 2006, on eye care work force, used a similar protocol to achieve the same 100% coverage which can be harnessed as a useful tool for related studies elsewhere under similar settings. The ECWs in the health institutions visited were enthusiastic about the study because according to them, such a study had not been done previously in the study areas. The gender distribution of the health workers showed a predominance of females 226(83.4%) over males 45(16.6%) with a modal age group of 30-39 years and mean age of 42.23±11 S.D years. This is similar to the studies done in Enugu by Eze et al [17] in which 70.9% of the health workers were females. The distribution of eye care workers in Orlu and Owerri showed a remarkable mal-distribution with a predominance of the integrated eye care workers(IECWs), 35(34.7%) and 67(39.4%) in Orlu and Owerri respectively. This finding is in tandem with the study done in Enugu [3]. The predominance of integrated eye care workers (IECWs) in the eye care services sector may lead to complications if they indulge in treating patients that need expert attention .However, Waife[8], in a tacit support for the training of IECWs opined that most of the cases that occupy the ophthalmologist's time can be delegated to others, if they are adequately trained and equipped. There is obvious mal-distribution of ophthalmic nurses in favour of Owerri metropolis 16(9.4 %) and 2(2.0%) in Orlu. It is noteworthy that 15 out of the 18 ophthalmic nurses in the study areas are working at FMC, Owerri(a Federal Government –based institution) where the remuneration is higher and regular payment of salaries

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and emoluments assured, when compared to State Government-based institutions where salaries and emoluments depends on the state's lean financial resources and other considerations. This agrees with the findings of the International Dialogue on Migration of health workers [18] held in Geneva between 24-26 of March, 2006. This report stated that under-supply of health care professionals globally – and particularly in the developing World – exists at all levels and includes, among others, shortages among doctors, nurses, midwives, anesthesiologists and pharmacists[18] . In a separate report by WHO [19] , the main reasons for absolute shortages of health care workers include under-investment in human resource development in the health sector , intensity of work, difficult working conditions, high levels of responsibility coupled with inadequate remuneration and lack of adequate respect for the occupation. Also, in another report by WHO [20] in 2007, on "Human Resources for Vision 2020", they opined that the workforce is limited by shortages, low productivity, mal-distribution and suboptimal outcomes and nowhere is this more pronounced than in the poorest countries, where the need is greatest, in sub-Saharan Africa and the poorer parts of other developing countries. Also, Herbert et al [21] in a report on "The Human Resources For Health Care Crisis in Zambia", observed that health workers were unevenly distributed in Zambia with a disproportionate concentration of higher cadres in urban centers and , this is similar to what has been observed in this research. Lemiere et al [22], also while reporting on the topic, "Reducing Geographical imbalances of Health Workers in Sub-Saharan Africa", observed a disconnect between the objectives/ efforts of the policy makers and the functioning of the national health system, thereby Accreducing the geographical- imbalances of health workers which was particularly noticed in Zambia and Sierra Leone.

In this research, it was also found that majority of the optometrists 11(6.5%) under government employment work in Owerri while only 2(2.0%) work in Orlu. This highlights the fact that the optometrists would prefer to work in Owerri since their private clinics are better to enjoy better patronage in the city centers compared with the rural settings where patronage is low. High profile spectacles such as varifocal (progressive addition)lenses and contact lenses may not be afforded by the rural poor , who find it difficult to put food on their tables up to three times daily. However, Gullapalli,[1] in a report, noted that the delivery of comprehensive refraction services at all levels, will require among other things, trained personnel to provide counseling on refractive error and, provision of spectacles which are acceptable and affordable to patients. To extend the coverage of these refraction services, it has been suggested that refraction services should be integrated into all levels of eye care , including out-reach and eye camp activities[8] . There is mal-distribution of the ophthalmologists in favour of Owerri since five work in Owerri while the remaining two work in Orlu. Usher[9] , while contributing to the proceedings of the 8th General Assembly of the IAPB observed that human resource crunch in eye care vary world-wide, from a dearth of people suitable for training to high levels of emigration of trained personnel. The lack of social amenities such as steady electricity supply, pipe-borne water, good roads and security has been advanced as contributing to the human resource disparity between Orlu and Owerri. This led to the recruitment of part-time consultants running the eye units for one year and similar to the report obtained in Enugu [3]. The self-selection of the available eye health care personnel into private sector jobs in the city centers where the remunerations are higher may be partly responsible for this mal-distribution. The result that most 170(62.7%) of the eye care workers live in Owerri implied massive rural to urban migration. This rural-urban drift has serious socio-economic consequences prompted by mal-distribution of social amenities in favour of the city centers while the rural dwellers suffer a dearth of such amenities. Also, social vices such as violent crimes and metropolitan slums are likely to spring up as a result of over-population resulting from massive rural-urban migration. Since only 63(23.2%) of the health workers were trained in eye care, a lot of work will need to be done in form of in-service training in eye care for the greaterun-trained 208(76.8%)ECWs to enable them become integrated eye care workers. This result is similar to a study by Onakpoya[23] in South-western Nigeria, in which he noted a dearth of trained manpower for primary eye care activities . Also, Karimurio [13] , while reporting on" Human Resources for Eye care in Kenya" opined that one of the key pre-requisites for achieving the objectives of Vision 2020 is the training, recruitment and retention of appropriate mix of adequately trained and well motivated eyecare workforce. However, the eye care personnel to population ratio could not be worked out in this study because of the un-accounted contribution from privately-owned eye clinics. Additionally, a study in Delta State Nigeria by Moyegbone J.E etal[24] show that specialist eye care providers are located in just 24% of local government areas and absolutely none (zero %) at any primary health center (PHC) in the state while Aghaji et al[25] in their studies showed that eye care facilities were unaffordable and mainly in the urban areas and tertiary health institutions beyond the reach of the rural poor

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The qualitative result showed inappropriateness to job postings with ECWs being posted to areas where they didn't specialize similar to the report by Usher[9] while sponsorship to updates is unevenly distributed where available with few being sponsored while those that go for updates and workshops were mainly self-sponsored.

CONCLUSION

The study showed a skewed distribution of ophthalmic nurses, optometrists and Ophthalmologists in favour of Owerri . However, the eye care personnel to population ratio could not be worked out in this study due to un-accounted contribution from privately-owned clinics which were not used in this study. There is an urgent need to address the eye care workforce mal-distribution gaps between the metropolitan Owerri and the sub-urban Orlu by provision of social amenities such as regular and adequate light supply, electricity and recreational facilities as well as establishment of industrial estates in Orlu to provide more job opportunities for the rural population. The rural poor will be able to pay for their health care bills thereby reducing the efflux of these specialized eye care professionals to Owerri. Additionally, the inappropriateness to job postings can be reduced drastically through re-training of workers and evenly distributed sponsorships to seminars, update courses , refresher courses and in-service training by governments at all levels. Also, the integration of the primary eye care into the health care system of the state will go a long way in bridging the health care gaps and by extension, the socio-economic gaps that exist between the more financially-endowed metropolitan population and the rural poor, agreeing with the popular saying that "health is wealth".

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