Access to cataract services in selected rural communities in South Africa

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Abstract

Background Despite government efforts to improve access to health care services through the re-engineered Primary Health Care and National Health insurance platform, access still remain a challenge particularly in rural areas. The aim of this study was to analyse secondary data on cataract patients who were attended to in selected hospitals in rural Limpopo of South Africa.

Methodology A cross section survey was conducted on 411 patient records from five selected hospitals in Vhembe district. A pre tested structured checklist was used to guide retrieval of variables from patient records. The collected data was entered into excel spreadsheet, cleaned and imported into Statistical Package for Social Sciences version 26 for analysis. Proportions of demographic characteristics were presented and these were cross tabulated with the outcome variable “success of operation” using Chi Squared tests.

Results Findings point out that majority of patients who attended hospital for eye services were aged 65 years above and females (63%). There was no association between the tested demographic characteristics and the outcome variable. Most patients were diagnosed in the period 2015-2018 (60%). Over 90% of those that were operated had successful operations. Of the remaining 10% that had unsuccessful operations, 30% cited complications as being the reason why these operations were unsuccessful.

Conclusions It is evident from the findings that cataract services offered in rural areas have low impact as they are not accessible to the patient. It is critical to have a worker retention strategy to retain experts.

Background

Cataract prevalence has been noted as one of the biggest challenges of the 21st century [1, 2]. It is noted that as a human being ages chances of cataract induced visual dysfunction and blindness also increases [1]. Development of cataracts have been linked to environmental and genetically factors [1]. The impacts are severe in Low and Middle Income Countries (LMCIs) due to unaffordability of health care services that in turn limit access to health facilities for cataract services [3]. Cataract diagnosis and surgery was the major target to reduce burden of avoidable blindness caused by cataract on the vision 2020, right to sight initiative that was launched by World Health Organization (WHO) and International Agency for the prevention of blindness [4]. More than 39 million people were reported to be blind by WHO in the LMICs and cataract was the cause of this avoidable blindness [5]. A cataract is defined as clouding of the normally clear lenses of the eye thus visually impairing ones vision [6, 7].

Barriers such as distance to health facilities, costs of transport and unavailability of people to accompany the cataract patient have been reported [8]. Lack of local resources and expertise such as none availability of human resources with skills to perform these surgeries and lack of infrastructure have been recorded as major barriers to access of cataract services in LMCIs [9]. Patients themselves particularly the old (65 years and above) fear having surgeries and being under unaesthetic as they feel

this might aggravate health problems that they will be suffering from, thereby reducing chances of them recovering from these surgeries [9]. It is presented in literature that the cost of eye surgery increased by over 10% from 200–2012 [10, 11].

South Africa has made great strides in the reduction of inequities so as to improve access to health by all in line with the health for all goal [12, 13]. The introduction of National Health Insurance (NHI) and Primary Health Care (PHC) re-engineering has tried to protect health care users from financial barriers that could minimize access to health services [12, 14]. PHC is meant take services to the people, and offer basic life sustaining services to everyone regardless of financial, social or ethnic status [15]. PHC re-engineering is a health sector strategy that buttresses the overall government strategy of ensuring “A long and Healthy life for all South Africans [3, 15]. It is centered on four main core outputs: increasing life expectancy, decreasing maternal child mortality, combating Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) and strengthening health system effectiveness [3, 15]. Cataract services are offered for free in government hospitals including in rural areas where only 16% have medical cover and an estimated 84% do not have [12].

In Limpopo, despite these efforts by the government, access to cataract services remain low [16]. This study therefore sought to analyse secondary data on cataract patients who were attended to in selected hospitals in rural Limpopo of South Africa.

Methods

2.1 Study design

A descriptive cross-sectional survey that involved reviewing of patients records who were diagnosed with cataracts from 2015 to 2018 was conducted. This research design was chosen as it allowed researchers to review patient records for the period of interest and extract variables of interest regarding cataract services rendered to patients [17]. This was done in a snap shot and was a cost effective design as it did not involve patients themselves directly as this was going to increase the cost of data collection [17]. Tis study design also allows for generalisations to be made as quantitative data analysis techniques could be instituted.

2.2 Study setting

The study was conducted in the selected hospitals in Vhembe District of Limpopo Province in South Africa. Vhembe District is located in the far north of Limpopo province. Limpopo is one of the nine provinces in South Africa, which consist of five Districts, namely: Vhembe District, Mopani District, Sekhukhune District, Capricorn District and Waterberg District. Vhembe District is situated in the north of the Limpopo province. Vhembe District has an estimated population of about 1 232 218 to 1 302 113, with 53.3% Females and 46.7% Males [18]. The district is mainly rural with the majority of the population

(80%) residing in rural areas [18]. For subsistence, there quite a number of activities that sustain livelihoods such as: agricultural products street vending, subsistence farming, receiving social grants from the government and being formally employed [18]. The general populace relies on public funded health institutions for eye services that are supported by the NHI scheme and social grants [19]. Only 17% of the general populace in this district has private health insurance leaving about 83% relying on government funded health care facilities [19]. Vhembe District has 8 hospitals i.e. one specialized mental health institution that only admit mental health care users, one regional hospital and six district hospitals respectively [20]. The study area is shown in *Fig 1.*

2.3 Study Population and sampling

The study population comprised of all records of cataract patients who were diagnosed in the period of 2002 to 2018 in 5 selected hospitals in Vhembe District. This gave a total of 411 records for the patients who met this inclusion criteria. All these files were included in this stud and were thus reviewed and analysed. 5 out of the 8 hospitals were selected i.e. based on the high number of cataract cases that they had received with the majority being on the waiting list awaiting surgery. These included Tshilidzini, Siloam, Donald Fraser, Elim and Malamulele. Of these five selected hospitals one was a regional hospital (Tshilidzini) and the rest were district hospitals. Elim hospital has an Ophthalmologist who conducts cataract surgery on daily basis, whilst in Donald Fraser the ophthalmologist comes once after every two months. The other three hospitals refer their patients to these two hospitals for surgery. A list of cataract statistics for all the eight hospitals was compiled from 2002 to 2018 the five hospitals that had highest number of patients were then selected to be part of the study. Researchers then went to the selected hospitals and with the assistance of the data clerk retrieved all the files for cataract patients' totaling to 411.

2.4 Data collection tool

A pre tested structured checklist was used to guide retrieval of variables from patient records. The checklist was divide into two sections i.e. the first probed on the demographic characteristics of the patients and the second section guided collection of data regarding access to cataract surgery. Variables such as: District, Name of the hospital, the residential community of the patient, age, gender, highest level of education, occupation, marital status and section two which was access to cataract surgery that consistent with the following; when diagnosed, current status of the eye as recorded by the ophthalmic nurse, optometrist or ophthalmologist, cataract surgery done and the outcome of the surgery, if the surgery was not done reasons for not going through with it, and also checking if the patient is receiving or received any eye treatment were retrieved and analysed. Data was collected from April 2018 to November 2018 as it took time to retrieve patient files.

2.5 Data analysis

The collected data was entered into an excel spreadsheet, cleaned and imported into Statistical Package for Social Sciences version 26 for analysis. Proportions of demographic characteristics were presented and these were cross tabulated with outcome variable “success of operation” using Chi Squared tests. The sample size of 411 enabled for generalisations to be made and inferences made at district level.

Results

3.1 Characteristics of patients attending hospitals in selected communities in Limpopo

Findings point out that majority of patients who attended hospital for eye services were aged 65 years and above. The bulk of these patients were females contributing 63% of the study subjects. There was no association between the tested demographic characteristics and the outcome variable “success of operation”. These findings are presented in *Table 1.*

3.2 Access to Surgery

Majority of the patients were diagnosed in the period 2015–2018 accounting for over 60% of the total patients. Over 90% of those that were operated had successful operations. Of the remaining 10% that had unsuccessful operations, 30% cited complications as being the reason why these operations were unsuccessful these findings are presented in *Table 2.*

Discussion

Findings of this study point out that over 80% of cataract patients are 65 years and above. It is presented in literature that the older one becomes that higher the chances and prevalence of cataracts [7, 21, 22]. It has been documented that cataract developments are influenced by genetic and environmental factors [7]. Aging increases vulnerability and thereby increasing the risk of one developing cataract [7]. However we found no relationship between age and success of surgery. However other studies have argued that chances of success of surgeries reduces as one ages [23].

Females contributed a larger proportion in our sample in those patients that were diagnosed with cataracts. These trends are well supported by a number authors who also found similar patterns [24–26]. It has been reported that women are genetically more susceptible to cataracts as compared to their male counterparts [24].

Over 58% of the patients still had poor vision though patients had been diagnosed from 2002–2018 though the eye operation procedure has a success rate of over 90%. It should be noted that patients

diagnosed with cataracts are not necessarily booked for surgery. The waiting list has grown over the years due to shortage of experts to perform these surgeries. LMCIs face a huge deficit in health care personnel as most migrate to other countries in search of greener pastures [27, 28]. This then cripples the health systems as they become less efficient. This in turn slows down delivery of cataract services to cataract patients as they have to wait for years to be afforded the opportunity to be operated.

It should be noted that out of the 411 patients that were diagnosed only 25% had access to surgery. This proportion is well below the target that all diagnosed should have access to surgery. Lack of resources is one of the major challenges as only two hospitals offered these services at the time of data collection. Only one hospital had a dedicated specialist who focused solely on cataract surgery whilst in the other hospital the specialist would come once in two months. The specialist to patient workload is therefore unbearable as all the other hospitals in this district referred their patients to these two facilities. It has been reported that in developing countries the specialist to patient ratio range from 1:1000 t0 1:2500 delaying access to critical services to needy patients as they have to wait longer for their turn [29].

5.0 Limitations

The grant that was received for this project was insufficient to cover a wider geographic location of South Africa. This led to the research being only conducted in Vhembe District only.

Conclusions

It is evident from the findings that cataract services offered in rural areas have low impact as they are not accessible to the patient. Limited resources particularly in relation to expertise to perform surgery. It is critical that staff retention incentives that could be supported under the PHC re engineering and NHI could provide a window of opportunity in ensuring success of this program.

Abbreviations

AIDSAcquired Immunodeficiency Syndrome

HIVHuman Immunodeficiency Virus

LCMIsLow and Middle Income Countries

NHINational Health Insurance

PHCPrimary Health Care

WHOWorld Health Organization

Declarations

8.1 Ethics approval and consent to participate

The study was approved by the Ethics Research Committee of the University of Venda (Ethical clearance number: SHS/17/PDC/15/2706), Limpopo Department of Health, Vhembe District Health, and the Chief Executive Officers of all selected hospitals. Records of patients were reviewed within the Hospital premises in the records room to ensure confidentiality.

8.2 Consent for publication

Not Applicable

8.3 Availability of data and material

Not Applicable

8.4 Competing interests

The authors declare that they have no competing interests.

8.5 Funding

This research was funded by the National Research Foundation (NRF), South Africa, award for the research project CPRR (UID 106047). The funder provided funds to cover the costs of conducting this research and it should be noted that the funder was not actively involved in the rolling of the research however the researchers submitted quarterly progress reports to the funder.

8.6 Authors’ contributions

LBK conceptualised and refined the study idea. The author further directed the project implementation, manuscript writing and sourced funding for the project, WNN, NN, NR, ST,BM, PM and TSM developed data collection tools, collected, analysed data and drafted the manuscript. All authors read and approved the final manuscript.

8.7 Acknowledgements

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8.8 Authors' information

LBK is the Former Dean of the School of Health Sciences at the University of Venda. WNN is a PhD in Public Health student at the University of Venda in South Africa, and is also a Lecturer in the Department of Environmental Science at National University of Science and Technology in Bulawayo in Zimbabwe. TSM and PM are PhD Students in the same university. NN, NR and BM are all lecturers in the School of Health Sciences.

References

1.Brian G, Taylor H: *Cataract blindness: challenges for the 21st century. Bulletin of the World Health Organization* 2001, *79:*249–256.

2.Polack S, Kuper H: *Measuring the impact of cataract services in the community. Community eye health* 2014, *27(*85):15–15.

3.Mayosi BM, Lawn JE, Van Niekerk A, Bradshaw D, Karim SSA, Coovadia HM, team LSA: *Health in South Africa: changes and challenges since 2009. The Lancet* 2012, *380(*9858):2029–2043.

4.Murthy G, Gupta SK, John N, Vashist P: *Current status of cataract blindness and Vision 2020: the right to sight initiative in India. Indian journal of ophthalmology* 2008, *56(*6):489.

5.Murthy GV, John N, Shamanna BR, Pant HB: *Elimination of avoidable blindness due to cataract: where do we prioritize and how should we monitor this decade? Indian journal of ophthalmology* 2012, *60(*5):438.

6.Cumming RG, Mitchell P: *Alcohol, smoking, and cataracts: the Blue Mountains eye study. Archives of ophthalmology* 1997, *115(*10):1296–1303.

7.Hejtmancik JF, Kantorow M: *Molecular genetics of age-related cataract. Experimental Eye Research* 2004, *79(*1):3–9.

8.Melese M, Alemayehu W, Friedlander E, Courtright P: *Indirect costs associated with accessing eye care services as a barrier to service use in Ethiopia. Tropical Medicine & International Health* 2004, *9(*3):426–431.

9.Grimes CE, Bowman KG, Dodgion CM, Lavy CB: *Systematic review of barriers to surgical care in low-income and middle-income countries. World journal of surgery* 2011, *35(*5):941–950.

10.Brown GC, Brown MM, Menezes A, Busbee BG, Lieske HB, Lieske PA: *Cataract Surgery Cost Utility Revisited in 2012: A New Economic Paradigm. Ophthalmology* 2013, *120(*12):2367–2376.

11.Busbee BG, Brown MM, Brown GC, Sharma S: *Cost-utility analysis of cataract surgery in the second eye. Ophthalmology* 2003, *110(*12):2310–2317.

12.Naidoo S: *The South African national health insurance: A revolution in health-care delivery! Journal of Public Health* 2012, *34(*1):149–150.

13.Nunu WN, Munyewende PO: *Patient satisfaction with nurse-delivery primary health care services in Free State and Gauteng provinces, South Africa: A comparative study. African journal of primary health care & family medicine* 2017, *9(*1):1–8.

14.Ataguba J: *Health care financing in South Africa: moving towards universal coverage. Continuing Medical Education* 2010, *28(*2).

15.Mohapi MC, Basu D: *PHC re-engineering may relieve overburdened tertiary hospitals in South Africa. SAMJ: South African Medical Journal* 2012, *102(*2):79–80.

16.Ntsoane MD, Oduntan OA, Mpolokeng BL: *Utilisation of public eye care services by the rural community residents in the Capricorn district, Limpopo Province, South Africa. African journal of primary health care & family medicine* 2012, *4(*1).

17.Rindfleisch A, Malter AJ, Ganesan S, Moorman C: *Cross-sectional versus longitudinal survey research: Concepts, findings, and guidelines. Journal of marketing research* 2008, *45(*3):261–279.

18.Kyei KA: *Some socio-economic indicators from Vhembe district in Limpopo Province in South Africa. Journal of Emerging Trends in Economics and Management Sciences* 2011, *2(*5):364–371.

19.Harris B, Goudge J, Ataguba JE, McIntyre D, Nxumalo N, Jikwana S, Chersich M: *Inequities in access to health care in South Africa. Journal of public health policy* 2011, *32(*1):S102-S123.

20.Shihundla RC, Lebese RT, Maputle MS: *Effects of increased nurses' workload on quality documentation of patient information at selected Primary Health Care facilities in Vhembe District, Limpopo Province. Curationis* 2016, *39(*1):1–8.

21.Asbell PA, Dualan I, Mindel J, Brocks D, Ahmad M, Epstein S: *Age-related cataract. The Lancet* 2005, *365(*9459):599–609.

22.Seddon J, Fong D, West SK, Valmadrid CT: *Epidemiology of risk factors for age-related cataract. Survey of ophthalmology* 1995, *39(*4):323–334.

23.Lee W-J, Hur KY, Lakadawala M, Kasama K, Wong SK, Chen S-C, Lee Y-C, Ser K-H: *Predicting success of metabolic surgery: age, body mass index, C-peptide, and duration score. Surgery for Obesity and Related Diseases* 2013, *9(*3):379–384.

24.Lewallen S, Courtright P: *Gender and use of cataract surgical services in developing countries. Bulletin of the World Health Organization* 2002, *80:*300–303.

25.Zhao J, Jia L, Sui R, Ellwein LB: *Prevalence of blindness and cataract surgery in Shunyi County, China. American journal of ophthalmology* 1998, *126(*4):506–514.

26.Nirmalan P, Padmavathi A, Thulasiraj R: *Sex inequalities in cataract blindness burden and surgical services in south India. British Journal of Ophthalmology* 2003, *87(7*):847–849.

27.Aluttis C, Bishaw T, Frank MW: *The workforce for health in a globalized context–global shortages and international migration. Global health action* 2014, *7(*1):23611.

28.Peñaloza B, Pantoja T, Bastías G, Herrera CA, Rada G: *Interventions to reduce emigration of health care professionals from low-and middle-income countries. Cochrane Database of Systematic Reviews* 2011(9).

29.Forgacs I: *The required number of physicians: is it an optimal figure? Cahiers de sociologie et de demographie medicales* 2002, *42(*2–3):269–282.

Tables

Table 1: Demographic characteristics of patients (outcome variable complications)

Variables	Category	N	%	Chi Square P-Value
Age (years)	10-20	2	0.5	0.553
	21-31	1	0.2	
	54-64	52	12.7	
	65 and above	356	86.6	
	Total	411	100	
Gender	Male	152	37	0.890
	Female	259	63	
	Total	411	100	
Education	None	184	44.8	0.446
	Primary	136	33.1	
	Secondary	83	20.2	
	Tertiary	3	0.7	
	Missing	5	1.2	
	Total	411	100	
Occupation	Unemployed	112	27.3	0.428
	Pensioner	216	52.5	
	Employed	71	17.3	
	Missing	12	2.9	
	Total	411	100	
Marital Status	Never married	50	12.2	0.260
	Divorced	11	2.7	
	Widow	99	24.1	
	Married	251	61.1	
	Total	411	100	

Table 2: Access to cataract surgery

Variables	Category	N	%
Period of diagnosis	2002-2006	9	2.2
	2007-2011	28	6.8
	2013-2014	125	30.4
	2015-2018	249	60.6
	Total	411	100
Current status of the eye	Poor vision	239	58.2
	Good vision	42	10.2
	Bilateral cataract	130	31.6
	Total	411	100
Had Cataract Surgery	No	309	75.2
	Yes	102	24.8
	Total	411	100
Outcome of surgery	Not successful	10	9.8
	Successful	92	90.2
		102	100
Reasons why surgery was not successful	Complications	3	30
	One eye operated	7	70
	Total	10	100
Type of treatment	Eye ointment	61	14.8
	Eye drops	350	85.2
	Total	411	100

Figures

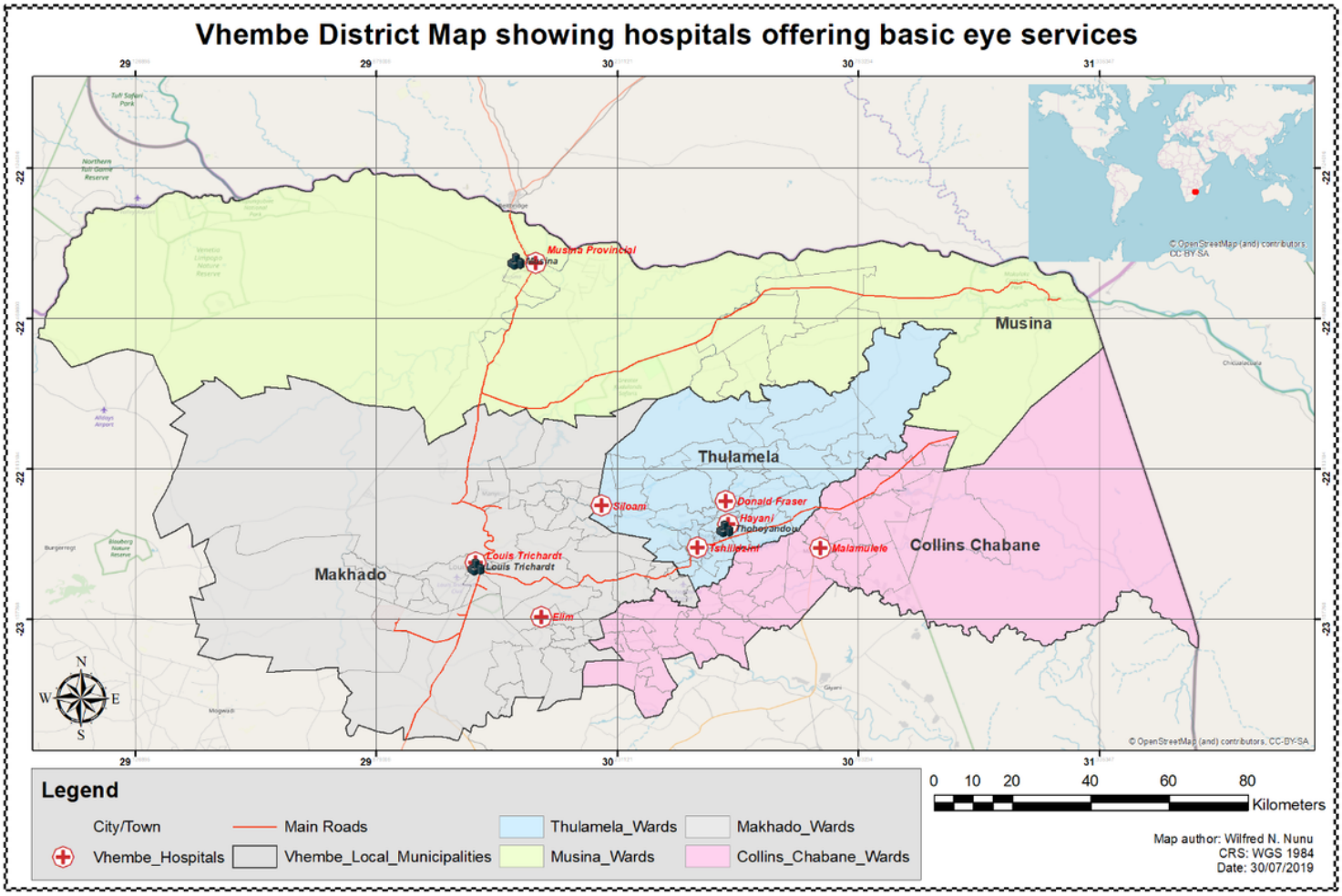

Figure 1

Study Area Map (Created By Wilfred Njabulo Nunu on 30/07/2019)