

# Risk Factors for Couching Practices in Plateau State, Nigeria: Results from a population-based survey

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## SUMMARY

**Aim:** To assess the trend and risk factors for couching practices among individuals aged 50 years or more in Plateau State, Nigeria.

**Method:** A population-based, cross-sectional survey. Multi-staged stratified random sampling, with probability proportional to size was used to select a representative sample of the state. The study instrument was the standardized Rapid Assessment of Cataract Surgical Services (RACSS) pro-forma. Records of participants who had their eye(s) couched were analysed for age at time of couching, duration of involvement in couching practice prior to the survey, senatorial district of residence, visual outcome in the couched eyes and use of glasses.

**Results:** Four thousand, one hundred and fifteen persons were examined (coverage: 98%). One hundred and nineteen (2.9%) persons had had cataract surgery before the survey. Of these, 27 (22.7%) persons had couched eyes. Eight (6.7%) persons had both eyes couched. Couching practice increased significantly with age from 7.4% at the age of 50-54 years to 29.6% at the age of 65-69 years, ( $p < 0.01$ ). Couching practice was lowest in Plateau North Senatorial District with 2 (4.2%) couched eyes, and highest in Plateau Central Senatorial District with 28 (58.3%) couched eyes ( $p < 0.01$ ).

**Conclusions:** The elderly and those who live far from the state capital are more at risk of being involved in couching practices. The findings from this study have revealed an urgent need for ophthalmologists in Plateau State to increase practical, effective and safe surgery to underserved communities in the state.

**Key words:** cataract, couching, risk factors

## INTRODUCTION

Cataract, a disturbance of lens transparency with resultant visual impairment, accounts for 47.8% of the world's 37

million blind persons.<sup>1</sup> Ageing is the commonest cause.<sup>2</sup> There were an estimated 6.7 million blind persons in Africa in the year 2002 with 50% of blindness attributable to cataract.<sup>1</sup> In Nigeria, the prevalence of blindness among individuals aged 40 years or older and 50 years or older is 4.2% and 5.5% respectively.<sup>3</sup> Cataract accounts for 43% of blindness.<sup>3</sup> An estimated 400,000 individuals are affected by operable cataract (i.e. visual acuity of  $< 6/60$  attributable to cataract) in Nigeria.<sup>4</sup> Majority of these cataract-blind persons live in the rural areas where blindness is associated with severe disability, mortality and huge socio-economic consequences. Its sheer magnitude makes cataract a matter of public health importance.

Couching, an ancient method of clearing the visual axis as a treatment for cataract, dates back to 1700 BC and was practiced in Assyria.<sup>5</sup> With the advent of intra-capsular cataract extraction (ICCE) in 1748, this procedure became obsolete. However, couching practices have persisted in poor and developing countries around the world, especially in sub-Saharan Africa and is carried out by itinerant traditional healers. In literal terms, a coucher is one who manipulates and dislocates the crystalline lens into the vitreous cavity. The knowledge of couching has been carefully protected and sequestered by generations of traditional healers.<sup>6</sup> The patients also are often not willing to describe exactly what was done to them.

Two methods of couching have been reported. An invasive method involves inserting a sharp instrument (e.g. a long thorn) through the pars plana or more posteriorly, and manipulating the lens to rupture the zonules. In the 'blunt' method, the lens is pushed backwards into the vitreous, either by massage or possibly by a 'magic drop' which may cause disruption of the zonules. This procedure is presumed to be safer.<sup>7</sup> Poor visual outcome and associated ocular complications of couching are well known and are familiar to some Nigerian ophthalmologists. It is not an acceptable way of treating cataract. The cumulative contribution to ocular morbidity, pain, suffering, low vision and blindness is unknown.

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As part of a population-based survey aimed at assessing the burden of cataract and the impact of services being rendered, the trend of couching practices in Plateau State over the years and the risk factors for couching practices were assessed..

## MATERIALS AND METHODS

This was a cross-sectional population-based survey conducted in January, March and November 2007. The Medical Ethics Committee of Jos University Teaching Hospital gave approval for the conduct of the study.

Multi-staged stratified random sampling, with probability proportional to size was used to select a representative sample of the state. One local government area (LGA) was randomly selected from each of the three senatorial districts in the state; these are Langtang South, Bokkos, and Bassa LGAs in Plateau South, Plateau Central and Plateau North senatorial districts respectively.

### Sample Size Calculation

An electronic copy of the 1998 census data for the state was obtained from the state office of the National Population Commission. The estimated target population was 627,206. To calculate the minimum sample size, the following parameters were used in the Rapid Assessment of Cataract Surgical Services (RACSS) software: an estimated prevalence of blindness due to cataract of 4% observed in a similar study in Northern Nigeria,<sup>8</sup> the precision of the prevalence of blinding cataract expected from this study was likely to be within  $\pm 10\%$  of the reference value (4%) in relative terms (i.e. will lie between 3.6-4.4%); 95% confidence intervals (CI) and a design effect of 1.7. The minimum sample size was 4148 subjects. Seventy clusters of sixty individuals (aged 50 years or older) were to be examined.

### Selection of Clusters

The name of each LGA was written on a piece of paper which was folded and dropped into a box allotted to its senatorial district. One LGA was randomly selected from each senatorial district. All settlements therein constituted the sampling frame. The list of all settlements in the selected LGAs with their population were entered into a Microsoft Excel spreadsheet. The first column contained the names of the settlements; the second column contained the total population of each settlement and the cumulative population was calculated in the third column. The total population of the three selected LGAs was 433,367. This figure was divided by 70 to obtain a sampling interval of 6190. A random number 0.655 was generated with the RACSS software and multiplied by the sampling interval (6190) to obtain the first

cluster, corresponding to 4054. This number was marked on the cumulative frequency list. The settlement in which this number fell was the settlement where the first cluster was located. To identify the settlement with the second cluster, the sampling interval 6190 was added to the number that identified the first cluster. The settlement in which this number fell was taken as the second cluster. The sampling interval was added again to find the settlement for the third cluster, and so on until all 70 clusters were located.

### Data Collection Procedures

There were four survey teams. Each team comprised an ophthalmologist, an ophthalmic nurse and a local health worker or village volunteer. Participants were recruited by the random walk method after an informed verbal consent was obtained. The standardized RACSS pro-forma<sup>9</sup> was used to obtain information on demographic data, visual acuity (VA), lens status, and principal cause of visual impairment for eyes with VA  $< 6/18$ . Visual acuity testing was done by an ophthalmic nurse from a test distance of 6 metres, using the Snellen "E" chart in ordinary daylight. Ocular examination was conducted by an ophthalmologist. The anterior segment of the eye was examined with the pen-torch. The status of the lens was graded as normal, obvious lens opacity, aphakia, pseudophakia without posterior capsule opacification (PCO) or pseudophakia with PCO, and no view if the lens could not be examined due to other ocular pathology, e.g. dense leucoma. This was done in accordance with the specified grading system in the RACSS manual.<sup>9</sup> The posterior segment was examined with a direct ophthalmoscope. When indicated, mydriasis was induced with phenylephrine (2.5%) and tropicamide (1%) eye drops to enable fundoscopy.

Participants with presenting VA  $< 3/60$  in one or both eyes which did not improve with pinhole, in the presence of obvious lens opacity in the same eye(s) were asked a standard question: "Why have you not been operated for cataract?". Each participant was allowed to provide four reasons. The responses were matched with a list of predetermined options provided in the RACSS questionnaire.<sup>9</sup> For each eye that had had cataract surgery or couching, attempts were made to obtain details of the surgical procedure. These details included the subject's age at the time of the surgical intervention; the location where the procedure was performed, the type and the cost of the procedure, use of spectacles and reasons for not using spectacles.

If an eligible individual was absent, the team returned to the house the same day. If after repeated visits the individual could not be contacted, demographic and visual status information (believed not blind or believed blind)

about the person was obtained from relatives or neighbours. The closest settlement was visited to complete sampling if the expected number of subjects could not be obtained in a selected cluster.

**Training**

All field staff were trained on the study procedure. A reliability study was conducted to measure the level of agreement between examiners in measuring VA and assessing lens status in accordance with guidelines in the RACSS manual. The kappa value indicated very good agreement ( $\kappa > 0.61$ ) between examiners.

Data on 4200 individuals were entered into the RACSS software (based on Epi-info version 6.04d, WHO, Geneva, Switzerland).

Data entry was validated by double entry and crosschecking of the entries. The RACSS software was used for data analysis. Frequency tables were generated. Statistical test for significance was done using the chi-square test. Correlation and coefficient of correlation were used for trend analysis.

Records of participants who had had their eye(s) couched and those who had had orthodox cataract extraction without intraocular lens implantation were further analysed for age at the time of surgery, duration of surgical intervention or involvement in couching practice prior to the survey, senatorial district of residence for participants involved in couching practices, causes of poor visual outcome and use of glasses.

The presenting VA was used to classify the visual outcome as good ( $\geq 6/18$ ), borderline ( $< 6/18 - 6/60$ ) or poor ( $< 6/60$ ), based on the guidelines of the World Health Organization (WHO).<sup>10</sup>

**RESULTS**

Of the expected 4200 participants aged 50 years or more, 4115 were examined (98% coverage). There were slightly more females (52.9%) in the sample  $\chi^2 = 17.4, p < 0.01$ , (table 1).

One hundred and nineteen (2.9%) persons had had cataract surgery; 65 (54.6%) were males and 54 (45.4%) were females. Of these, 27 (22.7%) persons had couched eyes with clinical evidence of couching from an invasive procedure. Eight (6.7%) persons had both eyes couched with clinical evidence of couching, 5 (4.2%) persons had one eye couched with obvious lens opacity in the second eye. Thirteen eyes did not have adequate clinical evidence of aphakia being attributable to couching from an invasive procedure but were classified as couched eyes (from a blunt procedure). A total of 48 eyes were couched. This represents 26.7% of all eyes that had a procedure for cataract.

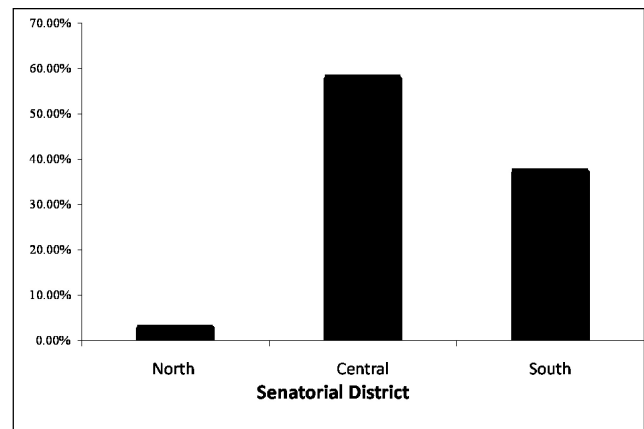
**Table 1.** Age and sex distribution of the study population

Age Group (years)	Male		Female		Total	
	No	%	No	%	No	%
50-54	457	23.6	620	28.5	1077	26.2
55-59	344	17.7	411	18.9	755	18.4
60-64	364	18.8	413	19.0	777	18.9
65-69	233	12.0	222	10.2	455	11.1
70-74	265	13.7	215	9.9	480	11.7
75-79	123	6.3	119	5.7	242	5.9
80+	153	7.9	176	8.9	329	8.0
TOTAL	1939	100.0	2176	100.0	4115	100.0

Fifty-six (47.1%) persons had undergone orthodox cataract surgery without intraocular lens in at least one eye. Of these, 18 (15.1%) persons had this surgery in both eyes, while 24 (42.9%) persons had a different cataract surgical procedure in the second eye.

Couching practices increased significantly with age from 7.4% at the age of 50-54 years to 29.6% at the age of 65-69 years, ( $\chi^2 = 12.2, p < 0.01$ ). Nineteen (70.4%) persons had at least one eye couched between the age of 55-69 years; more among females 11 (78.6%) than males 8 (61.6%),  $\chi^2 = 0.4, p > 0.05$ .

Couching practice was lowest in Plateau North Senatorial District as only 2 (4.2%) eyes were couched there. It was highest in Plateau Central Senatorial District where 28 (58.3%) eyes were couched. Eighteen (37.5%) eyes were couched in the Plateau South Senatorial District (figure 1).



**Figure 1.** Distribution of place of residence of individuals practicing couching.

Of the 48 eyes couched, only 14 (29.1%) were performed more than 5 years prior to the survey. Another 34 (70.9%) eyes were couched less than 5 years before the survey, while 7 (14.6%) eyes were couched less than 2 years prior to the survey (table 2). However, there was a moderately positive correlation between the number of couched eyes and

duration from the period of the survey. The longer the period between the time of surgical intervention and the survey, the larger the number of couching performed ( $0 < r < 1$ ), correlation coefficient  $r = 0.6$ . There has been a significant decrease in the practice of orthodox cataract surgery without IOL implantation. Only 3 (4.3%) out of 70 eyes had orthodox surgery, albeit without IOL implant less than 2 years before the survey (table 2). The trend analysis also revealed a moderately positive correlation between the number of cataract surgery without IOL and the duration from the period of the survey. The longer the duration from the period of the survey, the higher the number of cataract surgery without IOL ( $0 < r < 1$ ), correlation coefficient  $(r) = 0.85$ .

**Table 2.** Age and sex distribution at the time of couching

Age Group (years)	Male		Female		Total	
	No	%	No	%	No	%
50-54	1	7.7	1	7.1	2	7.4
55-59	2	15.4	3	21.4	5	18.5
60-64	2	15.4	4	28.6	6	22.2
65-69	4	30.8	4	28.6	8	29.6
70-74	2	15.4	0	0.0	2	7.4
75-79	0	0.0	2	14.3	2	7.4
80+	2	15.4	0	0.0	2	7.4
Total	13	100.0	14	100.0	27	100.0

Of the 48 couched eyes, only 1 (2.1%) eye had a good outcome (table 3), while 81.2% of eyes had a poor outcome by WHO standard which states that at least 85% of eyes operated for cataract should have a good outcome,  $< 10\%$  should have a borderline outcome while  $< 5\%$  should have a poor outcome.<sup>10</sup> Visual outcome remained persistently poor in couched eyes. The longer the duration an eye was couched prior to the survey, the poorer the outcome. Up to 92.9% of eyes operated more than 5 years before the survey had a poor outcome (table 4). Trend analysis revealed a moderately positive correlation between duration from the survey and the proportion of couched eyes with poor outcome. The longer the duration from the survey, the higher the proportion of couched eyes with poor outcome, ( $0 < r < 1$ ),  $r = 0.8$

**Table 4.** Trend of outcome in couched eyes

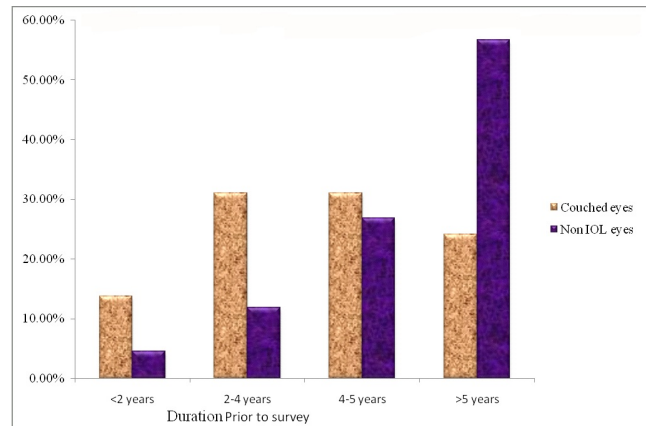
Category of VA	WHO standard	<2 years		2-4 years		4-5 years		>5 years	
		No	%	No	%	No	%	No	%
$\geq 6/18$	$\geq 85\%$	0	0.0	1	6.7	0	0.0	0	0.0
$< 6/18-6/60$	$< 10\%$	3	42.8	2	13.3	2	16.7	1	7.1
$< 6/60$	$< 5\%$	4	57.2	12	80.0	10	83.3	13	92.9
TOTAL	100%	7	100.0	15	100.0	12	100.0	14	100.0

**Table 3.** Presenting visual acuity in eyes that underwent couching

Category of Visual Acuity	WHO Standard <sup>10</sup>	No	%
$\geq 6/18$ (Good outcome)	$\geq 85\%$	1	2.1
$< 6/18-6/60$ (Borderline outcome)	$< 10\%$	8	16.7
$< 6/60$ (Poor outcome)	$< 5\%$	39	81.2
Total	100	48	100.0

None of the seven persons who had both eyes couched had aphakic spectacles, compared to 38.9% of individuals with bilateral orthodox surgery without IOL who had and were using their glasses.

Of the 5 persons who had one eye couched and had an obvious lens opacity in the second eye, 4 (80%) had a VA  $< 3/60$  in the second eye while one (20%) had severe visual impairment (VA  $< 6/60-3/60$ ) in the second eye. The barriers to uptake of cataract service among these patients included "surgical service not available" 1 (20%), "old age and need not felt" 1 (20%), "one eye has adequate vision, thus need not felt" 1 (20%), "fear of losing sight" 1 (20%) and "unaware of cataract as cause of blindness" 1 (20%).



**Figure 2.** Distribution of proportion of couched eyes and non-IOL orthodox cataract surgery.

## DISCUSSION

Despite the improvement in ophthalmic practice in Plateau State and in Nigeria as a whole, with state-of-the-art equipment available, couching is still prevalent in underserved rural areas and many traditional healers continue to perform this procedure on a regular basis.

A smaller proportion of eyes were couched in this study compared to the Nigerian national survey where 42.7% of eyes that had undergone a procedure for cataract had been couched.<sup>11</sup> This could be attributed to the availability of better eye care services in Plateau State compared to other states in Northern Nigeria. It is also worth considering that the number of couched eyes in this study may have been underestimated as some phthisical or disorganized eyes observed may have been couched.

Similar studies in Mali<sup>12</sup> and Burkina Faso<sup>13</sup> revealed that patients whose eyes had been couched had no knowledge of cataract and its management. This fact as well as non-availability of surgical services, financial difficulties, low costs and traditional beliefs, are factors that enhance couching practices in Nigeria and in sub-Saharan Africa in general.<sup>13</sup> Another contributory factor is the use of a simple technique with locally available materials. Moreover, the procedure is performed in the village where the patient resides and it is culturally acceptable in most rural communities.<sup>7</sup>

This study revealed that individuals living in the underserved Central and South senatorial districts of the state have a higher risk of being involved in couching practices as 58.3% and 37.5% of couching practices took place in these senatorial districts respectively. This can be largely attributed to lack of access to services. Two population-based surveys in Nigeria had also documented lack of access to service as a very important risk factor for involvement in couching practices.<sup>8,14</sup>

There are approximately 15 ophthalmologists in Plateau State,<sup>15</sup> i.e. an average of 1 for every 220,000 population. This figure is better than the "Vision 2020" target for Africa.<sup>16</sup> There are ten optometrists and at least thirty ophthalmic nurses serving in Plateau State. Cataract surgical services are offered by the tertiary health centre in the state, the state-owned specialist hospital, two mission-owned hospitals, one military hospital and four private hospitals.<sup>15</sup> Cataract surgical services are subsidized in all government and mission-owned hospitals. The distribution of ophthalmologists and other eye health workers in the state is however highly skewed in favour of Plateau North Senatorial District where the state capital is located.<sup>15</sup> Most of the ophthalmologists in the state are surgically active. Individuals who reside in Plateau North Senatorial District have easy access to standard cataract surgical services and

this explains why couching practice is least in this part of the state.

This study also revealed that the elderly were significantly at risk of being involved in couching practices. Lack of awareness, financial constraints, difficulty in accessing services and traditional beliefs all increase the vulnerability of the elderly cataract-blind person.<sup>8,12-14</sup> The elderly thus adopt crude, unacceptable interventions available in the community at all times, which apparently appears cheaper and affordable in terms of cost and duration of payment as this could be made in cash or kind over several months. It is a fact that in developing countries, a large proportion of those reversibly blind, especially from cataract, will never make it to eye centres. Hospital-based ophthalmic practice thus has a meagre contribution to the reduction of cataract backlog and prevention of blindness. Community-based extension services could bridge this gap until permanent services can be established.

Cataract outcome is the result of surgical intervention for visual impairment due to cataract.<sup>16</sup> Most couched eyes had poor outcome (VA <6/60) according to the WHO standard.<sup>10</sup> This is similar to findings from other parts of Northern Nigeria; 81% and 90.6% in Katsina and Kebbi states respectively,<sup>8,17</sup> and 88.0% from the Nigeria's national blindness and low vision survey.<sup>11</sup> A clinic-based study in Plateau State also revealed that 71.4% of couched eyes had a poor outcome.<sup>7</sup>

Documented complications of couching from various studies include: phacogenic uveitis (21.4%), endophthalmitis (10.7%), absolute glaucoma (61.5%), and optic atrophy (15.4%).<sup>7,18-19</sup> There is an urgent need to extend affordable cataract surgical services to the Plateau Central and Plateau South Senatorial Districts of Plateau State where couching practices are higher and where the ophthalmologist: population ratio is far below what is recommended.<sup>20</sup> Effective advocacy will enhance the implementation of the state's eye care plan. Community-based health education on the risk associated with couching and other traditional procedures is essential. The community also needs to be informed about the benefits of modern IOL surgery. The government and non-governmental organizations involved in eye care delivery should ensure services are made accessible to the rural populace. Once services are in place, it might be possible to train traditional healers or distributors of Ivermectin to become cataract case finders, as has been successfully undertaken in the Gambia.<sup>21</sup> Though a significant proportion of Nigerian ophthalmologists (66%) have reported a significant degree of community acceptance of traditional eye care practitioners (TECP) within their localities, most of these ophthalmologists (57.6%) are not willing to collaborate with traditional healers and are also against the integration of TECP into the health system.<sup>22</sup>The

Nigerian government, the Ophthalmological Society of Nigeria and TECPs need to enter into purposeful dialogue aimed at entrenching measures into the health system that will regulate and monitor TECP, discourage all forms of traditional surgical manipulation of the eye and identify and encourage the useful components of traditional eye care.

None of those who had both eyes couched had aphakic glasses. In contrast, a significant proportion of individuals who had orthodox surgery without IOL implant were using aphakic spectacles. This is similar to findings from the Nigerian national survey where up to 29.3% of individuals who had undergone orthodox cataract surgery without IOL were using aphakic spectacles.<sup>11</sup> The drastic reduction in the practice of orthodox cataract surgery without IOL implant observed is also similar to findings from the Nigerian national blindness and low vision survey.<sup>11</sup>

The elderly and those who live far from the state capital are more at risk of being involved in couching practices. Couching remains a major challenge to the Nigerian ophthalmologist. The findings from this study serve as a clarion call to all ophthalmologists in Plateau State and Nigeria to increase practical, effective and safe surgery to underserved communities in the state and the entire country. A qualitative study to explore other risk factors that predispose individuals to involvement in couching practices is very essential.

#### Acknowledgment

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