Comparison of the Clinical Profile of Patients with Glaucoma Between Private and Government Clinics in the Philippines

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ABSTRACT

Objective: To describe the demographic and clinical characteristics of patients with glaucoma managed at private and government institutions in the Philippines between 2009 and 2014.

Methods: A research team from two private and two government institutions in the Philippines reviewed the case records of 1246 patients seen who met the following criteria: intraocular pressure of >21 mmHg, optic nerve and nerve fiber layer abnormalities, and visual field defects. For bilateral cases, we selected the eye with worse glaucoma parameters.

Results: There were 600 and 646 patients in the private and government groups (mean age at presentation, 60.51 and 55.88 years), respectively, with the majority being Filipino (91%). Patients with visual acuity (VA) of 20/20 to 20/40 were more frequently observed in private centers (58.7% vs. 41.3%), while a VA worse than counting fingers was more frequently observed in government centers (66.1% vs. 33.9%). Within-group analysis showed that

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primary angle-closure glaucoma was the most frequent glaucoma subtype in both private (27.3%) and government institutions (37.8%). In between-group analysis showed the following to be more common in private than government centers: primary open-angle glaucoma (61.3% vs. 38.7%), normal-tension glaucoma (63.9% vs. 36.1%), ocular hypertension (92.3% vs. 7.7%), and glaucoma suspects (80.4% vs. 19.6%) while government institutions registered a larger number of primary angle-closure glaucoma (59.8% vs. 40.2%) and secondary glaucoma (70.3% vs. 29.7%) cases. Medical treatment using a single drug and multiple drugs was employed for 245 (23%) and 825 (77%) patients, respectively. Within-group analysis showed that laser iridotomy and trabeculectomy were the most commonly performed laser and surgical procedures in both institution types.

Conclusion: There is a contrasting profile of glaucoma between clinical institutions in the Philippines with open-angle glaucoma being more predominant in private centers while closed-angle glaucoma and secondary glaucoma being more frequent in government centers. Our findings may provide important preliminary information that can aid future health studies or training programs.

Keywords: Glaucoma, epidemiology, private institutions, government institutions, Philippines

Glaucoma is one of the leading causes of irreversible blindness worldwide, and it is expected to affect 111.8 million individuals by 2040. In Asia alone, the number of individuals with primary open-angle glaucoma (POAG) and primary angle-closure glaucoma (PACG) is expected to increase to 42.32 and 24.50 million, respectively, by 2040.[1]

The estimates described above have been derived from pooled glaucoma prevalence calculations in population-based studies[1] that did not include data from the Philippines. The prevalence of glaucoma as the third leading cause of blindness in the Philippines may have been underestimated in a previous study because the diagnosis was only based on optic nerve characteristics or a previous diagnosis or surgery.[2] No other local studies have estimated the overall prevalence of glaucoma in the country, although individual reports from different hospitals are available. From 2000 to 2002, 836 patients in the Philippine General Hospital, the premiere government hospital of the country, were diagnosed with glaucoma, with PACG and POAG accounting for 29.5% and 14.4% cases, respectively. The remaining cases were diagnosed with various types of secondary glaucoma.[3] Subsequently, data from St. Luke's Medical Center, a private tertiary hospital, showed that 570 patients were diagnosed with glaucoma between 2010 and 2014, with PACG, POAG, and other glaucoma types accounting for 24.78%, 22.80%, and 52.42% cases, respectively.[4] Despite these reports, the actual prevalence of this disease in the country has not been elucidated, and population-based studies are required to obtain estimates for the prevalence and incidence of glaucoma in the Philippines. Because such studies will require extensive planning, resources, and time, hospital-based studies can be conducted to derive initial data. Although data from such studies may differ from actual population estimates, they will provide a general overview or the initial information necessary for population-based studies.[5,6]

In 2017, the health expenditure in the Philippines was estimated to comprise 3.7% of the total income of families with a higher socioeconomic status (SES) and only 1.9% of the total income of families with a lower SES (bottom 30%).[7] Considering that only a fraction of the total medical expenses are covered by the social health insurance in the Philippines, which is often not enough to cover for the expenses in private centers, a diagnosis of glaucoma may prove to be onerous for a regular Filipino family. As a result, families belonging to lower income classes usually opt for care in government centers. Currently, there are only 13 private and 13 government eye institutions that are officially accredited by the Philippine Board of Ophthalmology. Thus, considering a total population of 105 million individuals, only 16 ophthalmologists per million individuals are estimated to cater to eye health in the Philippines. Moreover, specialized care for glaucoma is received only by 52 members of the Philippine Glaucoma Society (PGS) and a few nonmembers, and there are only four glaucoma fellowship programs recognized by PGS.

An extensive review of online repositories for scholarly literature (Google Scholar, PubMed, and the Philippine Journal of Ophthalmology) did not yield prior studies that compared patients with

glaucoma between government and private centers in the Philippines and abroad. Accordingly, the aim of the present study was to describe and compare the demographic and clinical characteristics of patients with glaucoma managed at private and government institutions in the Philippines between 2009 and 2014.

METHODOLOGY

We retrospectively reviewed the medical records of patients with glaucoma who were managed between January 2009 and December 2014 at two private [Asian Eye Institute (AEI), St. Luke's Medical Center Eye Institute (SLMC-EI)] and two government [Department of Health Eye Center East Avenue Medical Center (DOH-EAMC), Philippine General Hospital Department of Ophthalmology and Visual Sciences (PGH-DOVS)] institutions in the Philippines. The five-year period was selected based on feasibility and availability of patient records from the four hospitals. At least 300 records were aimed to be included per center. Institutional Review Board (IRB)/Ethics Committee approval was obtained from all centers, and the study protocol conformed to the standards set by the Declaration of Helsinki. Data confidentiality was ensured at all times.

A research team comprising consultants and fellows associated with the respective institutions collected data for the study after selecting records by convenience sampling. We included subjects diagnosed with unilateral or bilateral glaucoma on the basis of the International Society of Geographic and Epidemiologic Ophthalmology classification.[8] Glaucoma suspects (GS), defined by the presence of a family history, visual field defects, increased intraocular pressure (IOP), optic nerve abnormalities, and/or occludable angles without peripheral anterior synechiae, were also included. Subjects with incomplete data and those without documented structural or functional evidence of disease as per the clinical exam and ancillary procedures were excluded.

We encoded pertinent demographic data (age, gender, and ethnicity) as well as clinical data (ancillary examinations and treatments) in a standardized case report form. We included only one eye per patient in our analysis, selecting the eye with poorer visual acuity, higher IOP, and/or a larger cup-to-disc ratio (CDR) for cases with bilateral disease.

Statistics and Data Analysis

All data were statistically encoded using SPSS 16 (IBM Corporation, Armonk, New York, USA). Descriptive statistics (mean, range, percentages) were used to consolidate quantitative and qualitative variables. Data evaluation was done either through between-group analysis (B) or within-group analysis (W). To compare proportions between private and government institutions (B), we used the subtotals of each disease entity and other variables as denominator to compute for percentages. To compare proportions within each institution type (W), the subgroup totals were used. Results are labeled in the tables accordingly.

RESULTS

We analyzed a total of 1246 records (AEI: 300, SLMC-EI: 300, PGH-DOVS: 351, DOH-EAMC: 295). The majority of patients were women (55%) and Filipino (91%). Those of foreign descent were mostly seen in the private institutions. The mean age at presentation was 60.51 and 55.88 years in the private and government groups, respectively. Half of the total number of patients had been referred to the glaucoma department (368 in the private institutions and 259 in the government institutions). Other reasons for the hospital visits included, in descending frequency, blurring of vision, routine eye check-up, pain, redness, headache, and tearing, among others (Table 1).

In both institution types, IOP ranged from 2 to 80 mmHg, with mean values of 23.49 and 31.80 mmHg in the private and government groups, respectively. Of the 539 patients who underwent vertical CDR measurements in the government institutions, 17% (91) showed normal findings while 83.1% (448) showed a CDR of ≥0.5. Similarly, of the 423 patients with CDR measurements in the private institutions, 8.0% (34) and 91.9% (389) showed CDRs of 0.2–0.4 and ≥0.5, respectively. Forty-one (41) patients with a CDR of 0 in the private group were not included in our analysis because their CDR measurements were deemed possibly inaccurate (Table 1).

Table 1. Demographics and ophthalmological characteristics of patients with glaucoma in private and government institutions in the Philippines (2009-2014)

	Private	Government
Age, in years		
Mean	60.51	55.88
Range	0 to 94	0 to 89
Ethnicity, n		
Filipino	490	644
Filipino-Chinese	67	0
Chinese	11	0
Japanese	4	0
American	3	0
Indian	2	1
Not specified	23	1
Gender, n		
Male	287	278
Female	313	368
Chief complaint, n (%)		
Referral	368 (61.3%)	259 (40.1%)
Blurring of vision	77 (12.8%)	240 (37.2%)
Routine eye check-up	101 (16.8%)	30 (4.6%)
Pain	18 (3.0)	74 (11.5%)
Redness	8 (1.3%)	20 (3.1%)
Headache	2 (0.3%)	17 (2.6%)
Tearing	19 (3.2%)	7 (1.1%)
Dryness	3 (0.5%)	0 (0.0%)
Floaters	2 (0.3%)	0 (0.0%)
Not specified	2 (0.3%)	0 (0.0%)
Intraocular pressure, in mmHg		
Minimum	2	2
Maximum	80	80
Mean	23.49 (SD 13.22)	31.80 (SD 16.63)
Cup-to-disc ratio, n		
0	41	0
0.2	2	0
0.3	6	54
0.4	26	37
0.5	12	44
0.6	33	30
0.7	50	62
0.8	31	114
0.9	51	88
1.0	212	110

SD: standard deviation

Between-group results (B)

More private (58.7%) than government (41.3%) patients exhibited visual acuities (VAs) ranging from 20/20 to 20/40, while an almost equal number of private (50.5%) and government (49.5%) patients exhibited VAs from 20/40 to 20/200. Patients with VA worse than counting fingers were more frequent in the government (66.1%) than in the private institutions (33.9%) (Table 2).

Table 2. Visual acuities recorded from private and government institutions in the Philippines (2009-2014)

	Private			Government			TOTAL
	n	B (%)	W (%)	n	B (%)	W (%)	
20/20 to 20/40	247	58.7%	41.1%	174	41.3%	26.9%	421 (33.8%)
20/40 to 20/200	189	50.5%	31.5%	185	49.5%	28.6%	374 (30.0%)
Worse than CF	147	33.9%	24.5%	287	66.1%	44.4%	434 (34.8%)
Not specified	17	100%	2.8%	0	0	0	17 (1.4%)
Total	600			646			1246

B: between-group percentages, W: within-group percentages, CF: counting fingers

Government institutions registered a larger number of patients with PACG (private: 40.2%, government: 59.8%) whereas private institutions registered more patients with POAG (private: 61.3%, government: 38.7%). Cases of normal tension glaucoma (private: 63.9%, government: 36.1%), ocular hypertension (private: 92.3%, government: 7.7%), and glaucoma suspect (private: 80.4%, government: 19.6%) were more frequent in the private institutions, whereas secondary glaucoma (private: 29.7%, government: 70.3%) were more frequent in the government institutions (Table 3).

Table 3. Types of glaucoma encountered in private and government institutions in the Philippines (2009-2014)

	Private			Government			TOTAL
	n	B (%)	W (%)	n	B (%)	W (%)	
PACG	164	40.2	27.3	244	59.8	37.8	408 (32.7%)
Secondary glaucoma	96	29.7	16.0	227	70.3	35.1	323 (25.9%)
POAG	160	61.3	26.7	101	38.7	15.6	261 (20.9%)
NTG	53	63.9	8.6	30	36.1	4.6	83 (6.7%)
Ocular hyper-tension	48	92.3	8.0	4	7.7	0.6	52 (4.1%)
Glaucoma suspect	41	80.4	6.8	10	19.6	1.5	51 (4.1%)
Juvenile glaucoma	18	47.4	3.0	20	52.6	3.0	38 (3%)
MMG	11	61.1	1.8	7	3.9	1.0	18 (1.4%)
Absolute glaucoma	5	71.4	0.8	2	28.6	0.3	7 (0.56%)
Congenital glaucoma	4	80	0.7	1	20	0.2	5 (0.4%)
Total	600			646			1246

B: between-group percentages, W: within-group percentages, PACG: primary angle-closure glaucoma, POAG: primary open-angle glaucoma, NTG: normal-tension glaucoma, MMG: mixed mechanism glaucoma, Glaucoma suspects: family history, visual field defects, increased intraocular pressure (IOP), optic nerve abnormalities, and/or occludable angles without peripheral anterior synechiae were also included.

Government institutions (73.8%) had more cases of neovascular glaucoma (NVG) compared to private institutions (26.2%). NVG primarily occurred as a sequela of diabetic retinopathy or central retinal vein occlusion. Post-surgical glaucoma occurred after cataract surgery, retinal detachment surgery, or penetrating keratoplasty (private: 33.8%, government: 66.2%) (Table 4).

Table 4. Types of secondary glaucoma encountered in private and government institutions in the Philippines (2009-2014)

	Private			Government			TOTAL
	n	B (%)	W (%)	n	B (%)	W (%)	
Neovascular glaucoma	21	26.2%	21.6%	59	73.8%	25.4%	80 (24%)
PDR	*14*			*17*			*31*
CRVO	*3*			*13*			*16*
Other	*4*			*29*			*33*
Postsurgical glaucoma	26	33.8%	26.8%	51	66.2%	22.0%	77 (23%)
After retina	*10*			*22*			*27*
After cataract	*8*			*23*			*26*
After PKP	*8*			*17*			*24*
Post-traumatic glaucoma	10	20%	10.3%	40	80%	17.2%	50 (15%)
Lens-induced glaucoma	5	11.9%	5.1%	37	88.1%	16.0%	42 (13%)
Phacomorphic glaucoma	*4*			*28*			*32*
Phacolytic glaucoma	*0*			*9*			*9*
Lens particle glaucoma	*1*			*0*			*1*
Uveitic glaucoma	14	56%	14.4%	11	44%	4.7%	25 (8%)
Pseudoexfoliative glaucoma	2	9.1%	2.0%	20	90.9%	8.6%	22 (7%)
Steroid-induced glaucoma	7	50%	7.2%	7	50%	3.0 %	14 (4%)
Others (ICE, PPMD, suprachoroidal hemorrhage, SWS, pigmentary glaucoma, PSS, Fuchs iridocyclitis)	12	63.2%	12.4%	7	36.8%	3.0%	19 (6%)
Total*	97			232			329

*B: between-group percentages, W: within-group percentages, PDR: proliferative diabetic retinopathy, CRVO: central retinal vein occlusion, PKP: penetrating keratoplasty, ICE: iridocorneal endothelial syndrome, PPMD: posterior polymorphous corneal dystrophy, SWS: Sturge–Weber syndrome, PSS: Posner–Schlossman syndrome. *Total indicates number of subtypes seen in 323 cases of secondary glaucoma.*

In total, 1070 patients (86%) received medical treatment using a single drug (245 patients; 23%) or multiple drugs (825 patients; 77%). The top 3 preferred medications in private centers were prostaglandin analogues (PGA), alpha-adrenergic agonists, and topical carbonic anhydrase inhibitors (CAI). The government institutions preferred beta-blockers, oral CAIs, and alpha-agonists as the top 3 medications (Table 5).

Table 5. Antiglaucoma medications used in private and government institutions in the Philippines (2009-2014)

	Private	Government	Total
Prostaglandin analogs	304	138	442 (41.3%)
Alpha-adrenergic agonists	223	162	385 (36%)
Beta-blockers	88	260	348 (32.5%)
Oral CAIs	92	249	341 (31.9%)
Alpha-adrenergic agonists with beta-blockers	117	122	239 (22.3%)
Topical CAIs	143	47	190 (17.8%)
Prostaglandin analogs with beta-blockers	86	64	150 (14%)
Cholinergic agonists	26	40	66 (6.2%)
Beta-blockers with CAIs	48	7	55 (5.1%)
Hyperosmotic agents	1	9	10 (1%)
Alpha-adrenergic agonists with CAIs	0	2	2 (0.1%)
TOTAL	1128	1100	2228

*CAI: carbonic anhydrase inhibitor; *in total, 1070 patients (86%) received medical treatment using a single drug (245 patients; 23%) or multiple drugs (825 patients; 77%).*

Laser iridotomy was found to be more frequently done in government institutions (52.5%) compared to private institutions (47.5%). Diode cyclophotocoagulation was also more frequent in government institutions (76.2%) compared to private institutions (23.8%). In contrast, laser trabeculoplasty was more frequent in private (87.8%) compared to government institutions (12.2%) (Table 6).

Table 6. Laser procedures used for the treatment of glaucoma in private and government institutions in the Philippines (2009-2014)

	Private			Government			TOTAL
	n	B (%)	W (%)	n	B (%)	W (%)	
Laser iridotomy	56	47.5	40.6	62	52.5	41.1	118 (40.8%)
Diode cyclophotocoagulation	15	23.8	10.9	48	76.2	32.8	63 (21.8%)
Laser trabeculoplasty	43	87.8	31.2	6	12.2	4.0	49 (17.0%)
Laser iridoplasty	17	43.6	12.3	22	56.4	14.6	39 (14.5%)
Laser suture lysis	2	20	1.5	8	80	5.3	10 (3.5%)
Panretinal photocoagulation	4	5	2.9	4	5	2.6	8 (2.8%)
Nd:YAG cap membrane lysis	0	0	0	1	100	0.7	1 (0.3%)
Nd:YAG laser of tube	1	100	0.7	0	0	0	1 (0.3%)
TOTAL	138			151			289

B: between-group percentages, W: within-group percentages

More trabeculectomy procedures were performed in government (69.8%) compared to private centers (30.2%). Lens extraction either by phacoemulsification or extracapsular lens extraction was also more frequent in government than private centers (private: 35.8%, government: 64.2%) as well as combined trabeculectomy with lens extraction (private: 34.9%, government: 65.1%). Notably, the implantation of glaucoma drainage devices was more common in the private institutions (Ahmed® implant: 78.4% in the private and 21.6% in the government groups; Baerveldt® implant: 87.5% in the private and 12.5% in the government group) (Table 7).

Within-group results (W)

Majority of patients in private institutions were recorded to have VA within 20/20 to 20/40 (41.1%). In contrast, most patients from government institutions had VA of worse than counting fingers (44.4%) (Table 2).

PACG was the most frequent glaucoma subtype in both private (27.3%) and government institutions (37.8%). This was followed by secondary glaucoma (private: 16.0%, government: 35.1%) and POAG (private: 26.7%, government: 15.6%) (Table 3).

Post-surgical glaucoma was the most frequent secondary glaucoma type in private institutions (26.8%) whereas NVG was the most frequent type in government institutions (25.4%). Other types of secondary glaucoma included post-traumatic glaucoma, lens-induced glaucoma, uveitic glaucoma, pseudoexfoliative glaucoma, steroid-induced glaucoma, and others (Table 4).

Laser iridotomy was the most commonly performed laser treatment in both institution types (private: 40.6%, government: 41.1%). The second most frequent laser treatment was diode cyclophotocoagulation in government institutions (32.8%) and laser trabeculoplasty in the private institutions (31.2%). Table 6 lists the other commonly used laser procedures.

In both institution types, trabeculectomy was the most commonly performed surgical procedure (private: 45.3%, government: 62.9%) followed by lens extraction (private: 14.0%, government: 15.0%). Other procedures done for glaucoma patients are listed in Table 7.

Table 7. Surgical procedures for glaucoma in private and government institutions in the Philippines (2009-2014)

	Private			Government			TOTAL
	n	B (%)	W (%)	n	B (%)	W (%)	
Trabeculectomy	78	30.2%	45.3%	180	69.8%	62.9%	258 (56.3%)
ECCE or phacoemulsification	24	35.8%	14.0%	43	64.2%	15.0%	67 (14.6%)
Combined cataract/ filter	22	34.9%	12.8%	41	65.1%	14.3%	63 (13.8%)
Ahmed® glaucoma implant	29	78.4%	16.9%	8	21.6%	2.8%	37 (8%)
Baerveldt® implant	7	87.5%	4.1%	1	12.5%	0.3%	8 (1.7%)
Trabeculotomy or goniotomy	5	83.3%	2.9%	1	16.7%	0.3%	6 (1.3%)
PKP	2	50%	1.2%	2	50%	0.7%	4 (0.9%)
Avastin injection	2	50%	1.2%	2	50%	0.7%	4 (0.9%)
Silicone oil	0	0	0	3	100%	1.0%	3 (0.7%)
Goniosynechialysis	1	33.3%	0.6%	2	66.7%	0.7%	3 (0.7%)
Needling of bleb with 5-FU	1	50%	0.6%	1	50%	0.3%	2 (0.4%)
Pars plana vitrectomy	1	50%	0.6%	1	50%	0.3%	2 (0.4%)
AC-IOL explantation	0	0	0	1	100%	0.3%	1 (0.2%)
TOTAL	172			286			458

B: between-group percentages, W: within-group percentages, ECCE: extracapsular cataract extraction, PKP: penetrating keratoplasty, 5-FU: 5-fluorouracil, AC-IOL: anterior chamber intraocular lens

DISCUSSION

Studies describing the profile of glaucoma in private and government institutions are scarce, and to the best of our knowledge, the present study conducted in the Philippines is the first to compare the glaucoma profile between the two institution types using a single protocol involving one case report form. We hypothesized that the distribution of glaucoma types is unique to each institution type on the assumption that SES influences the healthcare-seeking behavior of patients. Those who seek consultation at government clinics exhibit delayed consultation because of a lower SES. These patients are expected to have poorer VA, a larger CDR, and end-stage glaucoma, which result in

an increased rate of cyclodestructive procedures. On the other hand, private centers cater to patients with higher SES who have the means to consult more often and undergo earlier interventions. These patients are often found to be cases of ocular hypertension (OHT) or glaucoma suspects.[9]

We found that half of the patients in the private institutions were referred by nonglaucoma specialists. Referrals in government clinics were generally prescreened by the respective general ophthalmology departments. Although this differentiates the patient flow between the institution types, it emphasizes the role of general ophthalmologists in screening patients for possible glaucoma.

The clinical profile of the government patients in our study was similar to that of patients in the study by FlorCruz *et al.*, who found that government patients do tend to have poorer VA, higher IOP, and a larger CDR at presentation. The authors concluded that patients who visit government centers tend to seek consultation only when the disease is symptomatic or late in the course of the disease because of financial constraints.[3]

Primary glaucomas accounted for the majority of cases in both private and government institutions. Within-group analysis showed that PACG was predominant in both institution types which is consistent with previous local studies.[3,4] Between-group analysis showed that there were more cases of POAG in private institutions. If we assume that private patients have higher SES, their ability to have regular eye care visits increases the identification of POAG even during the early, asymptomatic stages.

In total, POAG (20.9%) was more frequent than NTG (6.7%) in both institution types. Conversely, population studies from Japan and Korea found that NTG (2.7%–3.6%) was more common than POAG (0.3%–0.8%) in adults.[10,11] We also found that glaucoma suspects in the private institutions outnumbered those in the government institutions. This may be attributed to the larger proportion of eyes with a CDR of ≥0.5 in the private institutions, which also registered a larger number of patients with OHT. These findings are in agreement with previous observations that patients with higher SES were often diagnosed as cases of OHT or GSs, whereas those with advanced glaucoma subtypes exhibited a lower SES.[9]

The cumulative frequency of secondary glaucoma in our study was 25.9% from both institution types. In between-group analysis showed that more of these cases were seen in the government institutions, with NVG being the most common subtype. Most of these cases arose as complications of diabetes. This is in accordance with the findings of an international study where NVG occurred secondary to diabetic retinopathy in 39.7% cases.[12] Socioeconomic factors such as low income and educational level have been attributed to the development of NVG in patients with diabetes; this may explain the higher frequency in government institutions.[13] Within-group analysis showed that the leading cause of secondary glaucoma in private institutions was ocular surgery. This may be attributed to postoperative referrals by multiple eye doctors from other institutions.

Notably, the most frequently prescribed medications in the private institutions differed from those in the government institutions. PGAs, alpha-adrenergic agonists, and topical CAIs are presumed to be prescribed more often to private patients because they can afford more expensive medications. Medications such as beta-blockers and alpha-adrenergic agonists are often prescribed as cheaper alternatives in government centers. The use of oral CAIs in the government institutions in our study also reflects the severity of the glaucoma types seen in these institutions. A study in India found that the average cost of glaucoma medications was found to increase by 1.7 to 3.6-fold as the glaucoma severity progressed from asymptomatic to end-stage.[9] In addition, the expenditure for long-term glaucoma therapy may consume as much as 123% of the monthly gross income of patients with a low SES.[14]

Cumulatively, laser iridotomy was the most frequent treatment modality in both institution types. This agrees with the results of FlorCruz[3] and Martinez[4] with the latter also showing predominance of iridoplasty. The high frequency of laser trabeculoplasty in the private institutions reflect the accessibility of this treatment for patients with a higher SES and the ability of private centers to acquire new equipment more readily than government centers, where audit processes may stall acquisition. Between-group analysis showed that the use of diode cyclophotocoagulation was more common in government institutions. However, the preference for this treatment modality is unknown.

Previous local studies found trabeculectomy

to be the most common surgical procedure for glaucoma which aligns with our within-group analysis for both institution types.[3,4] However, we found that implantation of glaucoma drainage devices was more frequent in the private institutions using between-group analysis. Again, this suggests that patients with a low SES may have limited access to appropriate and costly interventions.

Collectively, it is our impression that the differences between the private and government institutions may be attributed to the SES of the patients. Those with a lower SES tend to have advanced conditions and may be inclined to delay consultations in government centers. Those with a higher SES are often diagnosed with milder forms of glaucoma. SES also dictates the treatment, as shown by the discrepant choices of medications in the two institution types and the greater access to equipment-dependent procedures such as selective laser trabeculoplasty in the private institutions. Future studies are suggested to look into the association between SES, glaucoma severity, and KAP (knowledge, attitudes, and practices) of patients. Likewise, quality of care between government and private institutions should also be compared.

This study has several limitations. First, hospital-based studies, such as the present one, have limited ability to extrapolate the true prevalence of the disease for the entire population. Nevertheless, they can provide useful information for future epidemiological studies.[5,15] Second, we used convenience sampling, wherein charts were gathered based on accessibility and availability at the time of data collection. Furthermore, it enabled us to achieve the sample size in a fast and inexpensive way. We acknowledge that this sampling method only assumes that members of the target population are homogenous and that there would be an inconsequential difference from findings obtained in a research based on random sampling. However, we may have included outliers in the population and may not have quantified their probabilities, which increased the risk of selection bias.[16] This limitation should be kept in mind when our findings are compared with those of studies based on randomly selected subjects. Finally, our data may not be representative of the different private and government institutions across the country. Furthermore, comparison of individual institutions in this study was not part of our objective. Homogeneity of the subpopulations was not analyzed.

In conclusion, our findings suggest that the profile of patients with glaucoma differs between private and government institutions in the Philippines. PACG was found to be the most common glaucoma subtype in both private and government institutions. When frequencies are compared between groups, private centers had more cases of POAG, NTG, and OHT while government centers registered a larger number of PACG and secondary glaucoma. Although the generalizability of these findings to all private and government centers in the country may be limited, our study provides preliminary data that can aid in the formulation of adequate health policies, construction of a uniform standardized glaucoma registry, and execution of future population-based studies. We also believe that these findings can be used to improve the training of future practitioners through the provision of a collaborative experience in both government and private glaucoma fellowship programs.

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