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The Determinants of Healthcare Cost for Glaucoma Patients in Cicendo Eye Hospital, Bandung, Indonesia

Determinansi Biaya Kesehatan Bagi Pasien Glaukoma di Rumah Sakit Mata Cicendo, Bandung, Indonesia

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ABSTRACT
Glaucoma is the second foremost cause of impaired vision. People who suffered from Glaucoma face the independent expenditure for the treatment as blind people with Glaucoma could not be cured perfectly. This study intends to analyze the effect of age, types of patient care, types of Glaucoma, and types of payment on the total cost of care of glaucoma patients at Cicendo Eye Hospital, Bandung, Indonesia. This study uses 3,358 patient medical records of Cicendo Eye Hospital, Bandung, Indonesia, in 2018. The 3,358 samples were selected from the patient's medical record based on patients' categories indicated or convicted of having Glaucoma. Robust Linear Regression is applied in this study to measure the additional cost for Glaucoma treatment. The results showed that the total cost of patient care was positively and significantly affected by hospitalization status (p=0.000), age (p=0.000), times of treatment (p=0.000), having primary glaucoma (p=0.000), having congenital glaucoma (p=0.000), and presence of intraocular (p=0.000). Conversely, patient care's total cost was negatively and significantly affected using insurance (p=0.082). This result would be a precautionary measure for the medical institution to consider better financial planning, service delivery improvement, and the patient's payment scheme effectiveness.

ABSTRAK
Glaukoma adalah penyebab kedua terbesar dari kebutaan. Orang yang menderita glaukoma akan menghadapi pengeluaran yang cukup besar untuk perawatan karena orang yang mengalami kebutaan dengan indikasi glaukoma tidak dapat disembuhkan dengan sempurna. Tujuan dari penelitian adalah untuk menganalisis pengaruh usia, jenis perawatan pasien, jenis glaukoma dan jenis pembayaran terhadap total biaya perawatan pasien glaukoma di Rumah Sakit Mata Cicendo, Bandung, Indonesia. Penelitian ini menggunakan 3.358 rekam medis pasien Rumah Sakit Mata Cicendo, Bandung, Indonesia di tahun 2018. 3.358 sampel dipilih dari catatan rekam medis pasien berdasarkan kategori pasien yang terindikasi atau yang sudah dinyatakan memiliki penyakit Glaukoma. Robust Linear Regression diterapkan dalam penelitian ini untuk mengukur biaya tambahan untuk perawatan Glaukoma. Hasil penelitian menunjukkan bahwa total biaya perawatan pasien dipengaruhi positif dan signifikan oleh status rawat inap (p=0,000), usia (p=0,000), waktu perawatan (p=0,000), memiliki glaukoma primer (p=0,000), memiliki glaukoma kongenital (p=0,000), penanaman lensa buatan (p=0,000). Sebaliknya total biaya

perawatan pasien dipengaruhi negatif dan signifikan oleh penggunaan asuransi (p=0,082). Hasil penelitian ini menjadi pertimbangan dasar bagi instansi kesehatan dalam perencanaan keuangan yang lebih baik, peningkatan pemberian layanan dan efektivitas skema pembayaran pasien.

INTRODUCTION

In the low-middle developing countries category, Glaucoma is one of the foremost causes of blindness. Approximately 285 million people have a visual impairment, and 39 million people of them get blind. Glaucoma causes 2% visual impairment and 8% permanent blindness. In 2020, glaucoma patients will increase by approximately 76 million worldwide.[1] Glaucoma is a disease characterized by the damaged optic nerve and visual impairment, including increased eye pressure that may cause blindness.[2] Around 60.5 million patients with Glaucoma in 2010 forecasted will increase to 79.6 million in 2020, and 74% of them will have Open Angle Glaucoma (OAG).[3,4] In Indonesia, there are approximately 427.091 inpatients on Glaucoma case recorded.[5]

Vision loss from Glaucoma has a significant negative impact on health quality and create a big economic burden.[6] The financial obligation due to Glaucoma is substantial not only for health systems but for the family and the patient.[7] Mostly rural people, lack of knowledge of glaucoma diagnosis has a worse impact on the visual condition. Delayed diagnosis and treatment of Glaucoma will create a higher cost to the patient. For example, received intraocular lenses implant did not have a significant visual recovery as the disease diagnosis was too late and also created a higher cost.[8] Early cost of Glaucoma treatment in 5 years studies from Mexico have examined the socio-economic aspects of glaucoma patients and state that low-middle income patients would be suffered from the cost of Glaucoma treatment rather than high-income patients.[7]

This study aims to analyze factors on the total cost of care of glaucoma patients at Cicendo Eye Hospital, Bandung, Indonesia, as Cicendo Eye Hospital is the leading national eye specialization treatment in Indonesia since 2009. Cicendo Eye Hospital has a broader scale for a more diverse patient that could be a prominent subject on the research. This study's results and knowledge would be advice or consideration for other hospitals and healthcare to improve disease treatment quality or even guide other research improvements.

MATERIAL AND METHOD

The layout of this study was a cross-sectional study. This study used secondary data from patient medical records in the glaucoma clinic in Cicendo Eye Hospital, Bandung, Indonesia. The population in the glaucoma clinic in Cicendo Eye Hospital was 4,269 patients. The total sample of this research was 3,358 patient medical records. Exact 3,358 record samples were used for the study arrange who had a glaucoma symptom. Some patients come to the glaucoma polyclinic to check for glaucoma status. After being examined, the patient did not have glaucoma symptoms. This study did not

include patients who did not have glaucoma symptoms.

The glaucoma symptom data collected based on the ICD-10 Glaucoma Reference Guide, and it was categorized for Primary Glaucoma and Secondary Glaucoma. ICD-10 code with H40.1, H40.2, and Q15.0 was the Primary Glaucoma. Diabetes Mellitus non-insulin retinopathy (E11.3), Cataract (H25.0, H25.1, H25.2, H26.1, H26.2, and H26.4) Injury (H11.3, H43.8, S05.0, S05.1, and S05.8), Inflammation (H00.0, H01.0, H10.1, H16.0, H16.2, H17.0, and H30.8), hypertension and intraocular disease (H05.2, H21.0, H33.0, H33.2, H33.4, H34.8, and H35.0) were the Secondary Glaucoma. Presence of Intraocular lens (Z96.1), other diagnoses (H40.0, H04.1, H11.0, H18.1, H27.0, H27.1, H35.5, H35.6, H40.8, H53.1, T15.0, H40.5) that included in Secondary Glaucoma Caused by Other Disease.

This data would observe total healthcare costs in Rupiah (IDR) currency (summed from medicine cost, patient treatment cost, the patient's factors and get a natural logarithm for the variable as the data transformation choices from the ladder in STATA) as the dependent variable. The independent variables for this case would be the age of the patient, Treatment Status (Dummy Variable, 1=Inpatient 0=Outpatient), Healthcare Utilization (number of outpatient visit+inpatient treatment), Primary Glaucoma and Secondary Glaucoma, Presence of Intraocular Lenses (Dummy Variable, 1=Yes 0=No), and Government aid payment presence (Dummy Variable, 1= *Badan Penyelenggara Jaminan Sosial* (BPJS) user, 0=Another payment bases). This research used statistical analysis with descriptive statistics and robust linear regression. The use of robust linear regression had been done to avoid the problem of classical assumptions.[9] All variables were considered significant at p<0,05. This research has gone through the ethical review process and obtained accurate information by the Research Ethics Committee of Universitas Padjadjaran with No. 788/UN6.KEP/EC/2019.

RESULTS

Summary statistics of the sample on this project has shown that there were approximately 3,358 patients with Glaucoma at Cicendo Eye Hospital in 2018. The average age of patients was 55.55 years (standard deviation 16.02). This observation's total cost was estimated at Rp2,804,877 in 2018, with the minimum total spent on glaucoma treatment, including the initial patient registration fee, initial examination, and medication costs were around Rp 10,000 at minimum and Rp 71,750,000 at maximum spending. Moreover, patients came to the hospital for treatment five times on average, and 17.7% had hospitalized records.

The patients categorized with the disease by 32.3% of patients had primary Glaucoma separated by 12.8% were OAG, and 19.2% were ACG. 63.7% of patients have faced secondary Glaucoma that happened with the symptoms, such as on average, cataract history by 2.89%, Ocular pressure by 5.66%, Diabetes mellitus with non-insulin therapy for retinopathy by

0.0685%. Leading causes of Secondary Glaucoma that categorized on the observation in mean, approximately 0.0715% caused by an injury that happens with or without the coincidence, 4.68% driven by Inflammation that occurred by many diseases, 1.01% of patient suffered Glaucoma by drugs, and 4.71% of patients suffered from other Glaucoma diagnosed. Furthermore, as the relationship with Inflammation after cataract/glaucoma surgery, patients with Intraocular lenses in Cicendo Eye Hospital reach 10.1% on average. Last, patients with Congenital Glaucoma reach 0.83% (Table 1).

Approximately 1,401 patients were recorded to have the main type of Glaucoma (Primary or Secondary Glaucoma). Related to the history of hospitalization, more patients with primary Glaucoma had been hospitalized for 54.57% of patients than patients with secondary Glaucoma, which were only 7.41% hospitalized in 2018. For the age category of patients, the average glaucoma patients over the age of 40 years, where primary Glaucoma dominated by more than 50 years old patients, which was 74.48% and those with secondary Glaucoma dominated by more than 50 years old patients, which was 60.68% of the total patients with secondary Glaucoma (Table 2).

Interestingly, on average, young patients began to detect primary and secondary Glaucoma in the age range 11 to 20 years, when secondary Glaucoma dominates the age category, which was 3.13% of total secondary glaucoma patients compared to primary Glaucoma that only around 1.24% of total primary glaucoma patients. To pay for all health examination activities on primary and secondary Glaucoma, 99.62% of patients tend to pay with another type of payment (cash or another insurance), and 0.38% of patients pay for the treatment with BPJS/JKS. Furthermore, in some cases, glaucoma patients could have surgery from a previous diagnosis. One of the treatments is post-operative cataract medication with intraocular lens placement.[10] There was 7.62% of primary glaucoma patients with Intraocular Lens and 8.26% of secondary glaucoma patients having Intraocular Lens' appearance (Table 2).

Table 1. Summary Statistics

Variable	N	Mean	SD	Min	Max
Total cost (Rp)	3,358	2,804,877	5,113,345	10,000	71,750,000
Total Cost (log)	3,358	13.72	1.564	9.210	18.09
Inpatient Status	3,358	0.177	0.382	0	1
Age (years)	3,358	55.55	16.02	0	98
Times of treatment	3,358	5.355	3.898	1	27
Primary glaucoma	3,358	0.313	0.464	0	1
Congenital glaucoma	3,358	0.009	0.094	0	1
Intraocular lenses	3,358	0.107	0.309	0	1
Open angle glaucoma	3,358	0.128	0.334	0	1
Angle closure glaucoma	3,358	0.191	0.394	0	1
BPJS	3,358	0.005	0.069	0	1
Secondary Glaucoma	3,358	0.064	0.244	0	1

Source: Secondery Data Cicendo Eye Hospital's Medical Record, 2019

Table 2. Main Case Patient Characteristics

Variable	Glaucoma			
	Primary		Secondary	
	n = 1050	%	n = 351	%
Hospitalized Record				
Never been hospitalized	477	45.43	325	92.59
Ever been hospitalized	573	54.57	26	7.41
Payment Type				
Other Payment Users	1046	99.62	350	99.72
BPJS Users	4	0.38	1	0.28
Age (Years)				
0 – 10	0	0	0	0
11 – 20	13	1.24	11	3.13
21 – 30	36	3.43	33	9.40
31 – 40	58	5.52	32	9.12
41 – 50	161	15.33	62	17.66
> 50	782	74.48	213	60.68
Intraocular Lenses				
No presence of intraocular lens (es)	970	92.38	322	91.74
Presence of intraocular lens (es)	80	7.62	29	8.26

Source: Secondery Data Cicendo Eye Hospital's Medical Record, 2019

Many patients are diagnosed as suspected Glaucoma (H40.0) in exceptional cases, and some of them might be diagnosed as congenital Glaucoma. Characteristics of this category were the number of patients diagnosed with congenital Glaucoma being hospitalized by 80% of them, and 20% did not have hospitalization records. For the suspected patient, all of them were never hospitalized before. Suspected patients around 0.56% only used BPJS Insurance as payment, and the rest were paid the examination bill with another payment type.

Moreover, the patients were categorized by age that on congenital Glaucoma 53.33% mainly from a young age (around 0-10 years old) and only one patient that approximately 40 years old that have congenital Glaucoma, as for the suspected glaucoma patients, there was 66.94% patient that categorize around > 50 years old, and the rest spread widely. For the last, 13.02% of patients were exposed to the presence of an intraocular lens implanted in their eye, and 100% of congenital glaucoma patients did not have an intraocular implant (Table 3).

Robust Model in Linear Regression chosen in concern of the parametric and non-parametric variables in the data.[11] The result concludes that the patient's age has a positive relationship with the healthcare cost that every patient that one year older than another patient could be increasing the glaucoma healthcare cost significantly by 0.7% caused by congenital Glaucoma. Early-age detection for Glaucoma might be hard to do because children (especially babies) had smaller eyes than adults. Same with age, hospital aspects from the patient such as treatment time and hospitalized record have a significant relationship with healthcare costs as each 1-time patient check to the hospital could increase the payment by 17.3% and 202% higher if the patient is hospitalized being outpatient status, respectively.

The disease has significant involvement in the increase in healthcare costs as it is the main concern of this study. Primary Glaucoma that divides into POAG and PACG has a significant increasing effect on the cost. People with earlier treatment would be served less cost as each treatment for Primary Glaucoma will increase the expenditure by 28.4%. The treatment cost on Congenital Glaucoma that mainly attacks young people would be expensive as each treatment will gradually increase the expenditure by 114.3%. Secondary Glaucoma with no other side disease treatment involves increasing expenditure by 8.5% and multiplying when combined with another symptom. People with Intraocular Lenses on their eyes have another cost factor for glaucoma treatment.

Those who have Intraocular Lenses will increase the expenditure by 14.2%. Patients that use public health insurance have a prosperity chance that *Badan Penyelenggara Jaminan Sosial* (BPJS) has decreased the payment by 48.9%. Without any symptoms and factors involved, the change in cost will be an 11.95% raise each year (Table 4).

Table 3. Special Case Patient Characteristics

Variable	Diagnosis of Glaucoma			
	Congenital		Suspected	
	n = 30	%	n = 1966	%
Hospitalized Record				
Never been Hospitalized	6	20.00	1966	100.00
Ever been Hospitalized	24	80.00	0	0
Payment Type				
Other Payment Users	30	100.00	1955	99.44
BPJS Users	0	0	11	0.56
Age				
0 – 10	16	53.33	4	0.20
11 – 20	8	26.67	54	2.75
21 – 30	5	16.67	137	6.97
31 – 40	0	0	149	7.58
41 – 50	1	3.33	306	15.56
> 50	0	0	1316	66.94
Intraocular Lenses				
No presence of Intraocular	30	100.00	1710	86.98
Presence of Intraocular	0	0	256	13.02

Source: Secondery Data Cicendo Eye Hospital's Medical Record, 2019

Table 4. Regression Result

Log (Cost)	Coef.	SE	t	*p*	95% Conf. Interval	
Inpatient Record, 1= Inpatient	2.021	0.060	33.83	0.000**	1.904	2.139
Patient Age	0.007	0.001	6.14	0.000**	0.005	0.009
Times of Treatment	0.173	0.005	37.72	0.000**	0.164	0.182
Primary Glaucoma	0.284	0.050	5.65	0.000**	0.185	0.382
Secondary Glaucoma	0.085	0.073	1.16	0.248	-0.059	0.229
Congenital Glaucoma	1.143	0.242	4.72	0.000**	0.669	1.618
Presence of Intraocular	0.142	0.039	3.64	0.000**	0.066	0.219
BPJS	-0.489	0.282	-1.74	0.082*	-1.041	0.063
Constant	11.945	0.073	163.83	0.000**	11.802	12.088
Mean Dependent Var		13.725	SD Dependent Var			1.564
R-squared		0.669	Number of Obs			3358.000
F-test		795.925	Prob > F			0.000
Akaike crit. (AIC)		8836.665	Bayesian Crit. (BIC)			8891.737

Source: Secondery Data Cicendo Eye Hospital's Medical Record, 2019

**p<0.1 | **p<0.01*

DISCUSSION

Many aspects can influence the total cost of glaucoma care. This model's interpretation uses the log method to present how many factors are involved in the healthcare cost with glaucoma patients and how much patients will use their money when one of their families is diagnosed with Glaucoma and its association. Song et al. found that age had a strong correlation with Glaucoma, and this study estimated that 3% of the global population over 40 years of age currently has Glaucoma.[6] More glaucoma cases for older people will increase the total cost of glaucoma care. El-Medany et al. found that the number of hospital visits was having a significant increase in the total cost of glaucoma care,[12] and this research in line with our findings Lin et al. found that age and hospitalization days increase the hospitalization cost significantly. So reducing unnecessary inpatient time can control the increase of hospitalization cost due to glaucoma care.[13]

McGinley, et al calculated the total cost of glaucoma care without a secondary diagnosis of Glaucoma. This research found that the total cost falls insignificant. The most recent data from 2017–2018 found that patients with a recorded secondary diagnosis of Glaucoma accounted for 9% of expenses for falls (£221,681/£2,489,928), with a mean cost of £2,806 versus £3,074.[5] for those with no secondary diagnosis of Glaucoma.[14] This conclusion was in line with our finding that secondary Glaucoma gives a positive effect but not significant to the total cost of glaucoma care.

Treating a patient that having Congenital Glaucoma would have a possibility for taking many types of surgery for a long time, and would be taking a complex treatment if the disease couldn't be recognize earlier.[15] Liu, et al found that congenital Glaucoma has a positive and significant impact on glaucoma cost. This paper found that childhood glaucoma will create a significant economic burden on the healthcare system and caregivers the highest price created by surgical intervention. Liu et al. found the direct costs are significant in the first years of the disease.[16]

Blanco et al. enrolled patients from 30 hospital eye services in five countries. They found the lens extraction was more expensive than the standard care. This paper found that the incremental cost effectiveness ratio was £14,284 for initial lens extraction compares to standard care.[17] Javanbakht et al. reinforce the statement that treatment cost for the lens extraction for £2467 in United Kingdom rather than standard care of glaucoma treatment.[18]

Nayak, et al found that 8% of patients had their medical costs reimbursed due to Glaucoma from health insurance or government schemes.[19] The reimbursed ease the cost of glaucoma treatment. This finding also in line with our finding that BPJS influences the decreasing total cost of glaucoma care at a 10% significance level, as the users mostly using another insurance or the one that financially stable often paid in direct cash for this case. Puspasari, et al in their research based on the medical record description method on Dr. Soedarso Hospital,

Pontianak, found that the BPJS patients have lower payment for typhoid fever patients by 2.71% rather than direct cash payment for typhoid fever patient.[20]

The determinant cost for this study has not been linked to the hospital's direct costs for glaucoma treatment, such as labor costs, equipment costs, land costs, and building costs. For future research, two things can be examined, and there are the direct costs associated with glaucoma treatment at the hospital and the indirect costs that the patient must incur, namely social costs.

CONCLUSION AND RECOMMENDATION

This study analyzes the factors that affect the total cost of glaucoma healthcare at Cicendo Eye Hospital, Bandung, Indonesia. There are some factors that increase the total cost of care significantly like hospitalization status (p= 0.000), age (p=0.000), times of treatment (p= 0.000), having primary glaucoma (p=0.000), having congenital glaucoma (p=0.000), and presence of intraocular (p=0.000). One factor increases the total cost of care but not significant, like having secondary Glaucoma (p=0.248). Conversely, patient care's total cost was negatively and significantly affected by insurance (p=0.082). Most of the patients use the BPJS Insurance as insurance from the government. Robust linear regression uses in this study examines every aspect that will affect the glaucoma treatment expenditure and offers a statement that would support patients in preliminary diagnosis to prevent high-cost care due to complications.

This result would be a precautionary measure for the medical institution to consider better financial planning for the service delivery improvement and the patient's payment scheme effectiveness. Glaucoma could be a tremendous problem in Indonesia if people barely understand primary medical care. The government's consideration for the public health program about Glaucoma could sustain people with better services and make concrete policies about glaucoma health care for welfare.

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REFERENCES

1. Flaxman SR, Bourne RRA, Resnikoff S, et al. Global Causes of Blindness and Distance Vision Impairment 1990–2020: A Systematic Review and Meta-Analysis. *The Lancet Global Health*. 2017;5(12):1221-1234.
2. Liu SA, Zhao ZN, Sun NN, Han Y, Chen J, Fan ZG. Transitions of the Understanding and Definition of Primary Glaucoma. *Chinese Medical Journal*. 2018;131(23):2852-2859.
3. Kapetanakis V V., Chan MPY, Foster PJ, Cook DG, Owen CG, Rudnicka AR. Global Variations and Time Trends in the Prevalence of Primary Open Angle Glaucoma (POAG): A Systematic Review and Meta-Analysis. *British Journal of Ophthalmology*. 2016;100(1):86-93.
4. Sun X, Dai Y, Chen Y, et al. Primary Angle Closure Glaucoma: What We Know and What We Don't Know. *Progress in Retinal and Eye Research*. 2017;57:26-45.
5. Sakti ES, Prahasta A, Lestari S, Mildya F. Situasi Glaukoma di Indonesia. Published online 2019:1-2.
6. Song P, Wang J, Bucan K, Theodoratou E,

Rudan I, Chan KY. National and Subnational Prevalence and Burden of Glaucoma in China: A Systematic Analysis. *Journal of Global Health*. 2017;7(2):020705.

7. Lazcano-Gomez G, De Los Angeles Ramos-Cadena M, Torres-Tamayo M, De Oteyza AH, Turati-Acosta M, Jimenez-Román J. Cost of Glaucoma Treatment in a Developing Country Over a 5-Year Period. *Medicine*. 2016;95(47):1-5.
8. Hegde SP, Sekharreddy MR, Kumar MR, Dayanidhi VK. Prospective Study of Hypermature Cataract in Kanchipuram District: Causes of Delayed Presentation, Risk of Lens-Induced Glaucoma and Visual Prognosis. *Kerala Journal of Ophthalmology*. 2018;30(3):187-192.
9. Yu C, Yao W. Robust Linear Regression: A Review and Comparison. *Communications in Statistics: Simulation and Computation*. 2017;46(8):6261-6282.
10. Ribeiro F, Ferreira T, Feijóo B, et al. Improving Outcomes with Multifocal Intraocular Lenses: Managing Glaucoma and Macular Evaluation. *Revista Sociedade Portuguesa de Oftalmologia*. 2016;40(3): 193-198.
11. Gomaa AS, Birch JB. A Semiparametric Nonlinear Mixed Model Approach to Phase I Profile Monitoring. *Communications in Statistics: Simulation and Computation*. 2019;48(6):1677-1693.
12. El-Medany A, Jeganathan VSE, Tatham AJ. Severity of Glaucoma at First Presentation to Hospital Eye Services. *International Journal of Open Access Ophthalmology*. 2017;2(1):1-5.
13. Lin B, Li Y, Zhang W, et al. Influencing Factors of Hospitalization Costs for Glaucoma Patients Under Clinical Pathway Management. *Annals of Eye Science*. 2019;4(8):36.
14. McGinley P, Ansari E, Sandhu H, Dixon T. The Cost Burden of Falls in People With Glaucoma in National Health Service Hospital Trusts in the UK. *Journal of Medical Economics*. 2020;23(1):106-112.
15. Mandal AK, Senthil S. Childhood Glaucoma Surgery in Developing Countries. *Surgical Management of Childhood Glaucoma*. Springer, Cham. 2018: 159-171.
16. Liu D, Huang L, Mukkamala L, Khouri AS. The Economic Burden of Childhood Glaucoma. *Journal of Glaucoma*. 2016;25(10):790-797.
17. Azuara-Blanco A, Burr J, Ramsay C, et al. Effectiveness of Early Lens Extraction for the Treatment of Primary Angle-Closure Glaucoma (EAGLE): A Randomised Controlled Trial. *The Lancet*. 2016;388(10052):1389-1397.
18. Javanbakht M, Azuara-Blanco A, Burr JM, et al. Early Lens Extraction with Intraocular Lens Implantation for the Treatment of Primary Angle Closure Glaucoma: An Economic Evaluation Based on Data from The EAGLE Trial. *BMJ Open*. 2017;7(1):1-12.
19. Nayak B, Gupta S, Kumar G, Dada T, Gupta V, Sihota R. Socioeconomics of Long-Term Glaucoma Therapy in India. *Indian Journal of Ophthalmology*. 2015;63(1):20-24.
20. Puspasari H, Suryaningrat D, Rizky M. Analisis Biaya Pengobatan Pasien Diagnosa Demam Tifoid di Instalasi Rawat Inap RSUD Dr Soedarso Pontianak Tahun 2018. *Jurnal Farmasi dan Ilmu Kefarmasian Indonesia*. 2020;7(1):1-6.