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Males tend to come earlier for eye care with the National Health Coverage Programme in private hospitals

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ABSTRACT

BACKGROUND
Cataract is the leading cause of blindness in Indonesia, and poverty is a major barrier to having cataract surgery. Increasing the proportion of adults that have regular, comprehensive eye examinations for cataract and other common eye health problems is one of the National Health Insurance (JKN) objectives. The objective of this study was to determine the impact of vision insurance on eye care utilization of cataract patients in private hospitals with the JKN system as social intervention.

METHODS
A cross-sectional study was conducted involving 230 cataract patients in a private hospital. Inclusion criteria were patients with cataract surgery, diagnosis and follow up visit minimally two months after surgery. A multiple logistic regression was used to analyse the data.

RESULTS
Initial visual acuity (VA) was 0.13 ± 0.15 and final VA was 0.91 ± 0.15. Two patients had final VA of 0.2 and 0.15, respectively, in which the first was associated with persistent corneal edema and diabetes mellitus, and the other with corneal scar. Age, gender, and level of education were not associated with VA at the first visit ($p>0.05$). Further analysis using a multiple logistic regression model was found to be significant ($p=0.0104$), with gender being associated with preoperative vision, where males tend to come earlier to undergo cataract surgery/treatment.

CONCLUSION
Males tend to come earlier than females for cataract surgery with the National Health Insurance (JKN) programme, despite the social intervention of the programme.

Keywords: Cataract, private hospital, universal health coverage, gender

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INTRODUCTION

The prevalence of blindness in Indonesia according to the Rapid Assessment of Avoidable Blindness (RAAB) survey in 2014-2016 reached 3%, making Indonesia the country with the highest blindness prevalence in South East Asia.[1] Differing from the national prevalence, the prevalence of blindness in Jakarta was 1.9%. The most common cause of blindness was cataract (>80%), a degenerative disease which can be easily cured by surgery.[2] There are some conditions which cause the high level of blindness, such as the demographic change with the increasing trend in the total population of elderly Indonesians, so that the prevalence of diseases related to degenerative processes also increases. In addition, the cataract surgical rate (CSR) in Indonesia is low because of the inadequate number and uneven distribution of ophthalmologists. Most ophthalmologists reside in big cities, for reasons such as convenience, their children's education, facilities, and other considerations. Therefore, people who live in remote areas tend to receive less health service, including eye health service, and this contributes to the national prevalence of blindness.[2]

Other obstacles that prevent patients from getting surgery are issues of knowledge, cost, location, the family's approval that cannot be obtained, fear due to the lack of knowledge, and comorbidities such as diabetes mellitus (DM) or hypertension, that must be managed first.[2] Ideally, the adequate number of ophthalmologists to serve a population group is one per 28,000 people, by looking at the ratio in Canada which has a good healthcare system.[3] Therefore according to this ratio, for Jakarta with 10,177,924 residents [4] 363 ophthalmologists are required. The number of hospitals in Jakarta is 154,[5] one of which is the Christian University of Indonesia Hospital (UKI Hospital) with three ophthalmologists. Some hospitals in Jakarta do not have ophthalmologists, therefore they refer the patients to hospitals which have such facilities.

Ever since the enactment of national health insurance in 2014, which is managed by the National Health Insurance (*Jaminan Kesehatan Nasional* (JKN)), the number of hospital visits has increased. Before that period, patients often came late for treatment because of financial reasons. The assumption that female are late in getting treatment is because males have priority over females in Indonesia, due to financial reasons (out-of-pocket payment). So far there have been no reports of JKN's social intervention on health services being linked to gender, in all areas of health services in Indonesia. In order to get an overview of health services in the JKN era, an overview from the Christian University of Indonesia Hospital (UKI Hospital) as a B type private hospital in regional area 1 will be given. This profile is needed in order to get a more comprehensive overview of JKN's social intervention impact on gender, along with an overview of demographic barriers, educational background and results of surgery.

METHODS

Research design

This retrospective study used data of patients who sought treatment due to cataract, which were collected from the medical records of UKI Hospital, January - December 2016.

Research subjects

Consecutive case study analysis was applied to collect clinical data from the medical records of patients with age-related cataracts. From the number of available data, it was expected that sufficient patients would be obtained to describe the population of patients who sought cataract treatment. The total sample per year was based on the calculation of 230 patients, which was according to the total number of surgical operations of 776 patients and the RAAB 2016 figure of 3%. The inclusion criteria were patients with diagnosis of cataract who had undergone surgery and visited the polyclinic for a follow-up examination at least 2

months after surgery. Incomplete examination caused patients to be dropped out of the assessment.

Data collection

The collected data covered patients' identity, gender, age, education, visual acuity, systemic diseases, and further treatments required if necessary. Education was recorded and classified as low if the patients' last education was elementary school or if they did not attend school, and classified as high if the patients' last education was middle school or higher. Best corrected visual acuity before and after the surgery was examined using a Snellen optotype and expressed in decimal units. Visual acuity was classified as poor if the patient could only see with finger counting from 6 meters (<0.1) and classified as good if visual acuity was more than 0.1 with the best correction.

Eye examination

The eye examination procedure in UKI Hospital was as follows. The patient had to do the registration first and would be examined in the clinic, including visual acuity measurement. Slit-lamp examination was conducted to find out the cataract thickness, its conformity with the ability to see, and pupillar isocoria, while funduscopy was performed on selected patients. After surgery, the patient would undergo follow-up examinations at least 3 times to get eyeglasses prescription. Follow-up examinations after surgery were conducted on day 1, day 7, and 3 weeks later. The medications given after surgery were steroid and antibiotic drops, as well as oral antiglaucoma drugs at a dose of 2 tablets per day for 3 – 5 days in order to resolve the possibility of intraocular pressure (IOP) increase. This was to anticipate the case of the viscoelastic injection not being totally aspirated after surgery. Topical steroid dosage was tapered-off, starting at 6 times 1 drop daily, and reduced by 1 drop every 5 days until it was stopped. During the follow-up visit, intraocular pressure (IOP) examination was also conducted. If a complication occurred, appropriate treatment would be given to resolve it.

Measurements

Systemic disease examination was conducted by an internist and the patient would receive appropriate treatment. Considering the surgery was conducted with local anaesthesia, standard examinations were performed, such as routine blood test and random glucose test, and electrocardiography if there was a suspicion of heart problems. The highest blood sugar level allowed for undergoing surgery was a random blood sugar level of <200g/dl. The highest blood pressure (BP) allowed was systolic BP <180mmHg and diastolic BP <95mmHg.

Statistical analysis

Clinical and demographic data were processed using SPSS 21.0 (SPSS, Chicago, IL, USA). A chi-square test and multiple logistic regression were used to analyse the data. The results were considered significant if $p<0.05$.

Ethical clearance

The study was conducted in compliance with the tenets of the Declaration of Helsinki. The Christian University of Indonesia Hospital Institutional Review Board granted approval for this study (No. 21/ Pen/KM/2017).

RESULTS

There were 776 cataract patients who sought treatment and received surgery in UKI Hospital in 2016. Samples were randomly taken and a total of 230 medical records were taken and divided into 15-20 medical records per month. Five patients could not be included due to incomplete follow-up examinations.

The study sample consisted of 106 (47.1%) male patients and 119 (52.9%) female patients, with no significant difference in gender ($p=0.424$). Mean age was 62.39 ± 10.25 years (range 31–83 years). There were 126 patients (56%) with middle - high school (or equivalent)

Table 1. Characteristics of patients with cataract surgery, UKI Hospital 2016

Characteristic	n	%
Gender :		
Male	106	41.6
Female	119	58.4
Age (years)	62.39 ± 10.25 (31 – 83)	
Education		
High		
University	44	19.6
Middle-High School	126	56.0
Low		
Elementary School	39	17.3
No Education	16	7.1
Surgery Technique		
Phacoemulsification	163	72.4
Extracapsular	62	27.6
Early Visual Acuity	0.13 ± 0.15	
Final Visual Acuity	0.91 ± 0.15	
Financing		
JKN	221	98
Personal	4	2

JKN : *Jaminan Kesehatan Nasional* (National Health Insurance)

education. Based on the classification of educational level, there were 170 patients (75.6%) with high level of education (middle school and higher). In this study, mean preoperative acuity was 0.13 ± 0.15, which was classified as low vision and due to cataract, but also as preventable blindness. Details are to be seen in Table 1.

There were 39 male patients and 47 female patients with poor visual acuity at the first treatment However, there was no significant difference in visual acuity between genders at the first visit (p=0.671). There were 126 patients (56%) with middle - high school (or equivalent) education. Out of 55 patients with low level of education, 25 patients (45.4%) had poor visual acuity (finger counting or worse) at the first visit. Out of 170 patients with high level of education, 61 patients (35.9%) had poor visual acuity at the first visit. However, educational level was not associated with visual acuity at the first visit (p=0.204) (Table 2).

Further analysis using multiple logistic regression was found to be a significant model, with gender as not a significant factor associated with preoperative vision (p=0.069), where males tend to come earlier for cataract surgery/ treatment. Details of the variables analysed in logistic regression are shown in Table 3.

Type of surgery and related factors

Phacoemulsification surgery was performed on 163 patients (72.4%) and extracapsular cataract extraction on 62 patients (27.6%). Mean early visual acuity during examination was 0.13 ± 0.15, and after the surgery reached 0.91 ± 0.15. There were 20 patients who suffered from mild to moderate corneal edema on the first day visit, and there were no signs of edema in 19 patients on the 7th day visit. There were 2 patients with final visual acuity of 0.2 and 0.15, respectively. In the first patient with final visual acuity of 0.2, severe corneal edema was found, which did not disappear until the follow-up examination two months after the surgery. This patient also had DM for more than 30 years and hypertension. The second patient with final visual acuity of 0.15 had a central corneal scar, so corneal transplantation was needed. Figure 1 shows the clinical pictures before and after the cataract surgery of one of the patients.

Table 2. Gender and level of education with visual acuity on first visit

Characteristics	Visual acuity		p value
	≤1/300 (n=86)	>1/300 (n=139)	
Gender			
Male	39	67	0.671
Female	47	72	
Educational level*			
High	61	109	0.242
Low	25	30	

*Education level : high : middle-high school and university; low : no education and elementary school

Table 3. Multiple logistic regression of several variables with preoperative vision

Variable	OR (β)	p value
Educational level	1.09	0.897
Age	1.04	0.101
Gender	0.28	0.069

Systemic disease can affect surgical preparation especially in relation to the tight budget of JKN in each service, and also affect visual outcome after surgery due to posterior segment disorders. Hhypertension was found in 61 patients (27.1%), diabetes mellitus (DM) in 17 patients (7.6%) and hypertension along with DM in 20 patients (8.9%). There were a total of 221 patients on the JKN programme and 4 patients on personal expense. There was one JKN patient who later underwent trabeculectomy surgery due to glaucoma (data not shown).

DISCUSSION

In this study the data shows that the total number of female cataract patients in UKI hospital was slightly higher compared to that of the males (58% vs 41%). This agrees with several studies which show that the total number of female cataract patients is much higher than that of male patients. Zetterberg et al.[6] report that according to evidence from epidemiologic data, cataract is more common in females than in males. This is not solely due to a higher rate of cataract extraction in females, as is the case in the western world. But several population-based studies show that female have a higher prevalence of lens opacities, especially cortical.There is no firm evidence that lifestyle-related factors are the cause of this gender discrepancy. The focus has, therefore, been directed towards the role of estrogen in cataract formation. In a remote area far from cities in Sumatera, a study conducted by Husain et al.[7] found that females have a higher prevalence of nuclear and subcapsular posterior types of cataract. On the other hand, gender does not have any significant connection with prior visual acuity. As is already known, preoperative visual acuity is an important indicator for the progress towards eliminating cataract blindness. One study reported from Nepal showed the same results about the relation between gender and preoperative visual acuity.[8] Preoperative visual acuity also illustrates the community awareness towards eye health care where upon the decrease in eyesight as initial symptom of cataract, the patient should immediately visit a primary health care facility for his/her problems. This can be related to access to medical facilities. This study states that preoperative visual acuity in male patients is better than that in female patients. This is because male patients visit the medical facilities immediately after they find that they have blurred vision. In developing countries such as Pakistan and India, it has been found that males have easier access to eye health services, especially cataract treatment,

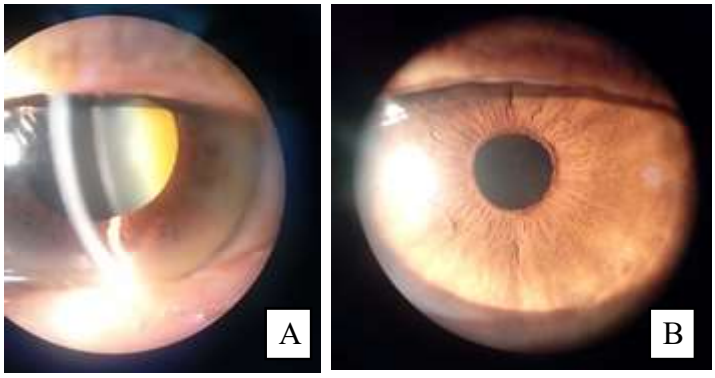

Figure 1. a. Cataract patient before surgery with visual acuity of 0.3 b. Clinical condition 7 days after phacoemulsification surgery, visual acuity 1.0 with correction

compared to females. This is influenced by three factors, i.e. social cultural differences, access to primary health care facilities, and life expectancy rate.[9-12] Courtright and Lewallen [13] reported that females may not have freedom of movement, their need for eye care may not be considered as urgent or important as that of male family members, or they may not have financial decision-making authority within the family to pay for eye care treatment services. In addition, the woman's child care responsibilities may make it difficult for her to leave home.

In connection with the level of education, this does not statistically affect visual acuity prior to surgery. More than 35% of cataract patients come with visual acuity which is classified as severe visual impairment or blindness. This may happen because the other eye might still have good vision or in the elderly and retired persons, his/her poor visual acuity is considered enough for them to do daily activities at home. The Beijing Eye Study states that there is no relationship of level of education with cortical cataract, retinal vein occlusion, systemic blood pressure, and intraocular pressure. However, the level of education is associated with myopia, decrease in nuclear cataracts and closed angle glaucoma.[14]

More than 70% of surgeries conducted in UKI Hospital used the phacoemulsification technique which is the latest technique that delivers excellent surgical results in a short period. Recovery of vision is obtained within 1x24 hours after surgery. If there is a complication in the form of posterior capsular rent, reimplantation of the lens after the complication can be managed in this hospital.[15] Other complications, in the form of rhegmatogenous retinal detachment or macular hole, can also be overcome under local anaesthesia.[16] In several cases, cataract surgery can be carried out with the extracapsular technique. This is still commonly used in hypermature/hard cataracts and/or old patients with low corneal endothelial cell counts. In general, the results of cataract surgery in UKI Hospital were good because more than 80% patients who underwent surgery had visual acuity better than 0.3 with a postoperative complication rate of under 5%. This fact is in accordance with studies in some Asian countries, in that both phacoemulsification and extracapsular techniques do not have significant differences in terms of the visual acuity achieved. The extracapsular technique is considered to be more efficient in terms of financing and to be widely applicable in developing countries.[17]

These good results will surely have a role in reducing the number of persons with cataract blindness in Jakarta in general. For patients, these results could increase their quality of life as well as productivity, while for hospitals these will be a good marketing tool. The cost of surgery should no longer be an obstacle for patients to obtain treatment or undergo surgery, ever since the national health insurance was enacted in 2014 and widely applied in both public and private hospitals.[18,19] The number of persons with blindness in Jakarta reached 1.9% and >80% of these cases were caused by unoperated cataract. Increasing the cataract surgical rate (CSR) is the only effective way to reduce the number of persons with cataract blindness. In developing countries such as Iran, where the number of persons with cataract is still quite high, increases in the number of cataract surgeries were made in order to raise the CSR and it has been found that during 2000-2005 the number of cataract surgeries and CSR increased from 526 to 1331 in these 5 years.[20]

Similar conditions were reported from China, where eliminating the backlog of patients with cataract blindness remains a formidable challenge in the urban areas of China. The widespread health insurance having somewhat removed the financial barriers to cataract surgery, it should have better coverage than at present, so educational efforts to further stimulate demand for surgery may be needed.[21,22]

The efforts to increase the number of cataract surgeries begins with the education about the symptoms of cataract, the best type of surgery with quick and painless results, and the cost of which is covered by the national health insurance.

Cataract patients' access to surgical services can be increased with the increase in the number of public and private hospitals which provide such services. It has to be kept in mind that cataract patients have limited vision, are mostly elderly and more often have degenerative/metabolic disease so that they have limited mobility and depend upon a caretaker. This is the reason why the provision of services near their home becomes very important.[23]

By providing cataract surgery services, a hospital must make a large investment in advance for equipment, expensive materials, trained human resources, and maintenance of tools and instruments for cataract surgery. The cost of cataract surgery using the phacoemulsification technique in public type B hospitals in Indonesia is Rp 7,560,000. In India, the cost is around $120 to $195 and the total financing for cataract and low vision management in India is around $2.6 billion. This amount is considered effective and efficient because it is lower than the amount that the government has to spend on social welfare for those who are unable to work due to blindness.[20] Discrepancies in financing and hospital claim issues are still a problem in the newly implemented JKN system. However, the existence of this health insurance system gives more opportunities for middle to lower classes to seek hospital treatment. Before the JKN era, there was the assumption that males come earlier for treatment for financial reasons, since payment is out of pocket; males will also be prioritised for cultural reasons. The present study found that even with JKN's social intervention which is predicted to eliminate this service barrier towards gender, gender bias is still to be found. This might be related to multiple factors and needs to be explored by further studies.

Our study has limitations in the assessment of JKN's social interventions, such as the situation before and after the launching of JKN, whether JKN can change the outcomes of health services related to gender, socio-economic status, and other factors. Gender itself might be affected by multiple factors, and needs to be explored by multivariate analysis using more data, which is beyond the scope of this study and needs further studies of different design.

CONCLUSION

The National Health Insurance (JKN) implemented by the government impacts on the distribution of eye health services. In spite of the JKN's social intervention programme which eliminates out of pocket payment and now makes services free, males still come earlier than females for cataract surgery.

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CONFLICT OF INTEREST

No conflict of interest was declared by the authors

FINANCIAL DISCLOSURE

No financial disclosure was made by the authors.

CONTRIBUTORS

GWS contributed to the concept and design of the study, data analysis and/or interpretation. JFT contributed to data acquisition and drafting. RNC revised the manuscript critically for important intellectual content. All authors read and approved the final manuscript.

REFERENCES

1. Das T, Ackland P, Correia M, et al. Is the 2015 eye care service delivery profile in Southeast Asia closer to universal eye health. Int Ophthalmol 2018;38:469-80. doi: 10.1007/s10792-017-0481-y.
2. Ministry of Health R.I. Road map for visual impairment control 2017-2030. Jakarta: Minstry of Health R.I.;2017.

3. Bellan L, Buske L. Ophthalmology human resource projections: are we heading for a crisis in the next 15 years? Can J Ophthalmol 2007;42:34–8. doi:10.3129/can.j.ophthalmol.06-115.
4. Biro Pusat Statistik Provinsi DKI Jakarta. Data penduduk Jakarta. Jakarta Pusat: Biro Pusat Statistik Provinsi DKI Jakarta;2017.
5. Dinas Komunikasi, Informatika dan Statistik Provinsi DKI Jakarta. Data jumlah rumah sakit dan tempat tidur menurut jenis rumah sakit DKI Jakarta. Jakarta: Dinas Komunikasi, Informatika dan Statistik Provinsi DKI Jakarta;2011.
6. Zetterberg M, Celojevic D. Gender and cataract – the role of estrogen. Curr Eye Res 2015;40:169-74. doi: 10.3109/02713683.2014.898774.
7. Bani A, Wang D, Congdon N. Early assessment of visual acuity after cataract surgery in rural Indonesia. Clin Exp Ophthalmol 2012;40:155-61. doi: 10.1111/j.1442-9071.2011.02667.x.
8. Gurung R, Shreshta MK, Muller A, et al. Preoperative visual acuity of people undergoing cataract surgery in rural and urban Nepal. Clin Exp Ophthalmol 2011;39:501–5. doi: 10.1111/j.1442-9071.2011.02524.x.
9. Rao GN, Khanna R, Payal A. The global burden of cataract. Curr Opin Ophthalmol 2011;22:4–9. doi: 10.1097/ICU.0b013e3283414fc8.
10. Lewallen S, Mousa A, Bassett K, et al. Cataract surgical coverage remains lower in women. Br J Ophthalmol 2009;93:295–8. doi: 10.1136/bjo.2008.140301.
11. Mundy KM, Nichols E, Lindsey J. Socioeconomic disparities in cataract prevalence, characteristics, and management. Semin Ophthalmol 2016;31:358-63. doi: 10.3109/08820538.2016.1154178.
12. Lipton BJ, Decker SL. The effect of health insurance coverage on medical care utilization and health outcomes: evidence from Medicaid adult vision benefits. J Health Econ 2015;44:320–32. doi: 10.1016/j.jhealeco.2015.10.006.
13. Courtright P, Lewallen S. Gender and eye health; why are we adressing gender issues in vision loss? CEHJ 2009;22:17-19.
14. Xu L, Wang YX, Jonas JB. Level of education associated with ophthalmic diseases: the Beijing eye study. Graefes Arch Clin Exp Ophthalmol 2010;248:49–57. doi: 10.1007/s00417-009-1204-5.
15. Simanjuntak GWS. Reimplantasi lensa setelah komplikasi operasi katarak. J Kes Mas Nas 2012;6:168-72. doi: http://dx.doi.org/10.21109/kesmas.v6i4.95.
16. Simanjuntak GWS, Simanjuntak GAM, Christine RN. Macular hole surgery under retrobulbar local anesthesia increases visual acuity. Univ Med 2017;363:160-165. doi: 10.18051/UnivMed.2017.v36.160-165.
17. Venkatesh R, Tan CS, Sengupta S, et al. Phacoemulsification versus small incision cataract surgery for white cataract. J Cataract Refract Surg 2010;36:1849–54. doi: 10.1016/j.jcrs.2010.05.025.
18. Battle JF, Lansingh VC, Silva JC, et al. The cataract situation in Latin America: barriers to cataract surgery. Am J Ophthalmol 2014;158:242–50. doi: 10.1016/j.ajo.2014.04.019.
19. Le H, Ehrlich J, Venkatesh R, et al. A sustainable model for delivering high-quality, efficient cataract surgery in Southern India. Health Aff 2016;35:1783–90. doi: 10.1377/hlthaff.2016.0562.
20. Hashemi H, Alipour A, Mehravaran S, et al. Five year cataract surgical rate in Iran. Optom Vis Sci 2009;86:890–4. doi: 10.1097/OPX.0b013e3181ae1cc6.
21. Huang W, Zheng Y, Wang L, et al. Cataract surgery in urban Southern China: the Liwan eye study. Invest Ophthalmol Vis Sci 2012;53:7936-2. doi: 10.1167/iovs.10-5382.
22. Meng Q, Xu L, Zhang Y, et al. Trends in access to health services and financial protection in China between 2003 and 2011: a cross-sectional study. Lancet 2012;379:805–4. doi: 10.1016/S0140-6736(12)60278-5.
23. Cabric E, Zvornicanin J, Jusufovic V. The safety and efficacy of day care cataract surgery. Med Arh 2014;68:117-20. doi: 10.5455/medarh.2014.68.117-120.