Special Article

Barriers to the Uptake of Cataract Surgery in Lumbini Nepal and Aranyaprathet Thailand

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Abstract

Health care access is the ability to obtain healthcare services such as prevention, diagnosis, treatment, and management of disease, illness, disorders, and other health-impacting conditions. For healthcare to be accessible it must be affordable and convenient. Many people do not have access to adequate healthcare. This is the situation for many in developing countries, but we also see lack of access to health services in developed countries like the United States. Healthcare professionals, institutions, and governments face difficult choices when providing adequate and equitable healthcare. Inaccessibility to healthcare is a public policy issue and, many people feel, a moral issue. Three important themes in healthcare access are: the problem of poverty, the many barriers to healthcare access, and the question of healthcare resource allocation. These themes generate controversies about the role and alleviation of poverty, how to overcome access barriers, and how to fairly allocate limited resources to those most in need.

Our team conducted research on barriers to uptake cataract surgery in two different countries, in order to better understand the barriers to healthcare access and how to overcome access barriers. Thailand is representative of a middle to high income country, where the government provides free treatment and Nepal is representative of a low income country, where treatment is not free. Cataract surgery was chosen as an example to illustrate the challenge of access to healthcare—cataracts can significantly impact patients' physical and mental health, the socioeconomic status of patients and patients' families and is a societal burden (government subsidies).

Keywords: barriers cataract surgery, Healthcare failure, NGO and healthcare, Public-private partnership

Cataract is the leading cause of blindness, accounting for 50% of blindness worldwide.[1] A number of studies have shown a relationship between visual impairment and increased mortality.[2] Visual impairment is associated with psychological conditions including social isolation, cognitive impairment, increased dependency on others, poor self-rated health, and depression.[3] Poor vision in older adults has a major impact on overall mental health compared to stroke and heart attack.[4] Aside from an increase in mortality and morbidity, cataract and visual impairment also reduce a patient's quality of life. Cataract can become an economic burden on a patient and their family.[5] Surgical removal of cataract and replacement with an artificial lens remains the only therapy.[6] Universal health care in Thailand have been providing free cataract surgery for all Thais.[7] Nepal's Government has no free program for cataract surgery but there are multiple NGOs and surgical camps offering free cataract surgery.[8] Despite this healthcare provision, there remain many severe and blinding cataract patients in Thai and Nepal rural areas. Several barriers including: fear of surgery, perceived need, lack of knowledge, attitudinal barriers and cost have been reported.[9]

Nepal is a lower middle-income country and Thailand is a higher middle-income country. In the 2022 GNI per capita report, Nepal ranked 161th in the world and Thailand ranked 87th with a GNI per capita of US$1,340 and

US$7,210 respectively.[10] In the 2021 Human development index report, Nepal ranked 143rd and Thailand ranked 66th.[11]

Aranyaprathet is a well-equipped hospital in the center of the district with two ophthalmologists and the waiting time for surgery is short, requiring only two visits before surgery. Despite provision of free cataract surgery and cheap transportation in the district, there are many Thais in Aranyaprathet district who cannot access free cataract surgery. In commemoration of HRH Princess Maha Chakri Sirindhorn's 68th Birthday, Banphaeo General Hospital Foundation together with Aranyaprathet hospital and Rotary Thailand arranged the first free cataract surgery camp in this area.

In Lumbini, Nepal, there is poor road and transportation infrastructure, and the nearest hospital is up to 50 kms from the village. The treatment for cataract surgery would currently cost 8,000 Nepalese Rupee (US$60). Phra Sribodhivides, Abbot of the Royal Thai Monastery in Lumbini Nepal has organized free cataract surgery camps 13 times. More recently, in cooperation with the Tilganga hospital, Royal College of Ophthalmology Thailand, the Thai ambassador to Nepal in collaboration with the Vajirapongpan fund, has organized free cataract surgery for patients in Lumbini and nearby provinces. Announcements were broadcasted by vans 2 days before the camp started. Transportation to the 3 nearby cities, accommodation, medicine and food for patients and relatives were provided free of charge. Blankets were given to all patients. The cataract camp was co-organized by Tilganga Institute of Ophthalmology, Nepal under Dr. Sanduk Ruit's supervision. Dr. Ruit has restored the sight of more than 180,000 people across Africa and Asia using small-incision cataract surgery. The institute also manufactories high-quality intraocular lenses for US$3. The low cost has made cataract surgeries affordable to the world's poorest people.

How cataract camps in Lumbini Nepal and Aranyaprathet Thailand were organised

We studied the barriers to the uptake of cataract surgery in Lumbini Nepal and in Aranyaprathet Thailand. From a group of patients who had already completed their cataract surgery and were in for post-operative evaluation the next day, (820 patients in Nepal, and 236 patients in Thailand), 78 patients in Lumbini, and 79 patients in Aranyaprathet, Thailand, were randomly selected and permission was granted to give a semi-structured questionnaire read by a local translator and interviewer. The first data collection was conducted during December 9-12th, 2022 in Lumbini Nepal. 820 patients who lived around Lumbini, Nicotoram, Kabilapat and Ramakam had previously been diagnosed with severe or blinding cataract by local health officials or by doctors from Tinganga Institute of Ophthalmology and had undergone successful cataract surgery. From this cohort, 78 patients (9.51%) were randomly selected for interview. Methods included semi structured questionnaires and interviews. All lenses were provided by Tilganga Institute of Ophthalmology for free. The Nepali ophthalmologists employ the small incision cataract surgery method which takes 5-8 minutes per case. The Thai ophthalmologists use the extracapsular cataract extraction method (ECCE with IOL) or Phacoemulsification method (Phaco with IOL) which takes 8-10 minute per case.

The second data collection was conducted during March 24-25th, 2023 at Aranyaprathet district, Sa Kaeo province, Thailand. A total of 236 patients who lived in Aranyaprathet district came for eye screening for severe cataract or blindness by local health officials or by doctors from Banphaeo General Hospital during the period of one day. 79 patients underwent successful free cataract surgery provided by Banphaeo General Hospital during a period of 1 day. All 79 patients (100%) were selected for interviews. Methods included semi-structured questionnaires and interviews. Banphaeo General Hospital Foundation has conducted several cataract surgical camps across Thailand over many years, using imported high-quality intraocular lenses (Akreos Adapt AO lens; BAUSCH&LOMB). All lenses were subsidized by the Thai government. The ophthalmologists used the extracapsular cataract extraction method (ECCE with IOL) or Phacoemulsification method (Phaco with IOL) which takes 10-15 minutes per case.

Research tool

1. Questionnaire: Barriers to the uptake of cataract surgery in Lumbini, Nepal (in Nepali) and Aranyaprathet, Thailand (in Thai).
2. Thai and Nepali versions of the EQ-5D-5L questionnaire. This questionnaire is a general health quality of life measurement tool. It is designed so respondents can answer on their own. The questionnaire consists of two parts:

(I). 5 Health-related questions in 5 dimensions
   i. Mobility: In this study the questionnaire asked about difficulty in walking
   ii. Self-care: In this study the questionnaire asked about difficulty in self-bathing and self-dressing.
   iii. Usual activities: In this study the questionnaire asked about difficulty in house cleaning and undertaking leisure activities.
   iv. Pain/discomfort: In this study the questionnaire asked about pain and discomfort in daily life.
   v. Anxiety and depression: In this study the questionnaire asked about feeling worried, sad and unhappy.

(II). In each dimension, patients had to choose the level of difficulties that match with them the most. 1=no problem, 2 =small or little problem, 3 =moderate problem, 4 =severe problem, 5 =severe problem or cannot perform the activities.

Calculation of Utility score

Ranging from 0 to 1, the utility score represents the satisfaction of a person with their health. 0 means death, 1 means perfect health. Theoretically the utility score can be negative which means worse than death. The result of the EQ-5D-5L displays the description of the 5 dimensions of health care, which can be translated into the utility score by

using perfect health utility score (equal to 1) minus the coefficient score of each of the 5 dimensions. Coefficient score represents the utility score loss from having imperfect health. The coefficient score differs in each country depending on perception of health.

Data Analysis

In this research, the mean, standard deviation in numerical variables were analyzed. Amount and percentage values in group type variables, together with analyzing the relationship of Reason for not seeking surgery prior, the EQ5D-5L between the Lumbini group and the Aranyaprathet group using chi-square statistics, with statistical significance set at p-value < 0.05. All data were analyzed using ready-made software using STATA Version.15.

Ethics Approval

The study followed the tenets of the Declaration of Helsinki. Permission was granted by Aranyaprathet Hospital. Informed consent was requested before each interview with respondents either signing or providing their thumbprint. In Lumbini, Nepal permission was granted by Tinganga Institute of Ophthalmology Kathmandu and the Royal College of Ophthalmology of Thailand.

General Data for the patients undergoing cataract surgery in Lumbini, Nepal, and Aranyaprathet, Thailand.

General Data for the patients undergoing cataract surgery

In Lumbini, Nepal, 78 patients out of 820 patients were randomly selected for interview. The mean age was 61.8 + 9.3 years. There were 40 patients (51.25%) who were under the age of 60 years old. In Aranyaprathet, Thailand 79 patients out of 236 patients underwent cataract surgery and all were interviewed. The mean age was 69.7+7.6 years. There were 6 patients (7.6%) who were under the age of 60 years old. There were 2 patients form Lumbini who had lens dislocation post-surgery that needed re-operation. There were no other complications found in both countries.

Of the patients interviewed, 94.87% of Lumbini, Nepal patients and 30.38% Aranyaprathet, Thailand patients respectively live on less than THB2,000 baht per month. Lumbini, Nepal provided cataract surgery free of charge, including the lens, transportation, accommodation and food supported by the cataract camp. While in Aranyaprathet, Thailand only the cataract surgery and lens were provided free of charge as shown in Table 1.

Barriers to the Uptake of Cataract Surgery in Aranyaprathet, Thailand and Lumbini, Nepal

The barriers to the uptake of cataract surgery in Aranyaprathet, Thailand, and Lumbini, Nepal were different. In Aranyaprathet, the main barriers were (1) lack of information (30.38%), (2) unaware of treatment (25.32%), (3) can't afford (16.46%). While in Lumbini, Nepal the main barriers are (1) can't afford (94.87%), (2) wait for surgical camp (85.90%), (3) hospital is to far (48.72%) as shown in Table 2.

Differences in general health quality of life (EQ- 5D-5L) immediate fist day after surgery between Lumbini, Nepal and Aranyaprathet, Thailand

Study results and test results for differences in general health quality of life (EQ- 5D-5L) immediate fist day after surgery between Lumbini, Nepal and Aranyaprathet, Thailand

From the result of the study, it was found that 42.31% of cataract patients in Lumbini, Nepal had Mobility problem, 23.08% had Self-care problem, 28.21% had Usual activities problem, 61.54% had pain/discomfort problem, 26.92% had anxiety and depression. While in Aranyaprathet, Thailand, it was found that 58.23% had Mobility problem, 54.43% had Self-care problem, 59.49% had Usual activities problem, 36.71% had pain/discomfort problem and 58.23% had anxiety and depression problem.The mean EQ 5D-5L score of Lumbini, Nepal is 0.8325 and Aranyaprathet, Thailand is 0.7721 respectively ($p = 0.0476$).

When comparing the differences of EQ-5D-5L immediately after surgery between Lumbini, Nepal and Aranyaprathet, Thailand, it was found that the problem of Mobility, Self-care, Usual Activities, anxiety/depression were significantly different at the 0.001 level ($p < 0.001$) and the problem with pain/discomfort was significantly different at the 0.01 level ($p = 0.002$) as shown in Table 3.

Table 1: General Data for the patients undergoing cataract surgery

Cataract camp	Aranyaprathet Thailand	Lumbini Nepal
Number of patients who underwent cataract surgery	79	820
Number of patients interviewed	79	78
Complication-lens dislocation	0	2
Age < 60	6 (7.6)	40 (51.25)
Mean age	69.7 + 7.6	61.81 + 9.3
Income < THB 2000 baht / month	30.38%	94.87%
Free cost of cataract surgery and lens	Yes	No*
Transportation/accommodation/food available for free	No	No*

*but Supported by Cataract camp

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Table 2: Barriers for the Uptake of Cataract Surgery in Aranyaprathet, Thailand, and Lumbini, Nepal

No	Reason for not seeking cataract surgery prior	Aranyaprathet, Thailand (n = 79), (n(%))	Lumbini, Nepal (n = 78), (n(%))	*p*
1	Hospital is too far	14 (17.72)	38 (48.72)	< 0.001
2	Not affect my life	0 (0)	4 (5.13)	0.059
3	No trust in the hospital	1 (1.27)	0 (0)	NA
4	Unaware of treatment	20 (25.32)	2 (2.56)	< 0.001
5	Lack of information	24 (30.38)	5 (6. 41)	< 0.001
6	Requires multiple visits	9 (11.39)	1 (1.28)	0.009
7	Wait for surgical camp	5 (6.33)	67 (85.90)	< 0.001
8	Can't afford	13 (16.46)	74 (94.87)	< 0.001
9	No one to accompany	6 (7.59)	3 (3.85)	0.312
10	Afraid of surgery	13 (16.46)	6 (7.69)	0.092
11	It's God's will	0 (0)	0 (0)	NA
12	Others	0 (0)	0 (0)	NA

Table 3: EQ-5D -5L immediate post-surgery in Lumbini Nepal and in Aranyaprathet Thailand

EQ-5D-5L dimension	Aranyaprathet, Thailand (n = 79), (n(%))	Lumbini, Nepal (n = 78), (n(%))	*p*
Walking			< 0.001
No problem	33 (41.77)	45 (57.69)	
Any problem	46 (58.23)	33 (42.31)	
Washing			
No problem	36 (45.57)	60 (76.92)	< 0.001
Any problem	43 (54.43)	18 (23.08)	
Doing Usual Activities			
No problem	32 (40.51)	56 (71.79)	< 0.001
Any problem	47 (59.49)	22 (28.21)	
Having Pain or Discomfort			
No problem	50 (63.29)	30 (38.46)	0.002
Any problem	29 (36.71)	48 (61.54)	
Feeling Worried, Sad or Unhappy			
No problem	33 (41.77)	57 (73.08)	< 0.001
Any problem	46 (58.23)	21 (26.92)	
Score, Mean+SD	0.77+0.19	0.83+0.18	0.0476

A difference in age might explain why the EQ-5D-5L in Aranyaprathet is lower than in Lumbini which has a younger population ($p = 0.047$). Our findings showed that 51.25% of patients in Lumbini and 7.6% of the patients in Aranyaprathet were severe cataract patients under the age of 60.

Learning from Cataract Camps in Lumbini, Nepal and Aranyaprathet Thailand.

A weakness of this study is the absence of direct communication with the patients in their local language, which required translators. Patients were not interviewed in a separate room, and there were distractions during the interview. Patients seemed uneasy when choosing the level of difficulties in EQ-5D-5L questionnaires.

The study revealed that the barriers to the uptake of cataract surgery are different in the two locations. In Lumbini, Nepal the main barriers are (1) can't afford (94.9%), (2) wait for surgical camp (85.9%), (3) hospital is to far (48.7%). In Aranyaprathet, Thailand the barriers are (1) lack of information (30.4%), (2) unaware of treatment (25.3%), (3) can't afford (16.5%). Aside from focusing extensively on patient's health-related issues, Governments and health-care providers can also take a population health approach.[12] This would involve focusing on developing an understanding of patient's income, social status, support networks, education, employment/working conditions and social and physical environments.

The study showed an association between cataract (poor vision) and a decrease in quality of life as show in the mean EQ-5D-5L score in both Lumbini, Nepal (0.83 + 0.18) and in Aranyaprathet, Thailand (0.77 + 0.19). A difference in age might explain why the EQ-5D-5L in Aranyaprathet is lower than in Lumbini which has a younger population ($p = 0.047$). Our findings showed that 51.25% of patients in Lumbini and 7.6% of the patients in Aranyaprathet were severe cataract

patients under the age of 60. Prior studies have shown that in developing countries the incidence of cataract among young generation is not uncommon due to malnutrition, excess exposure to ultraviolet radiation and so on.[13]

In Lumbini, Nepal, 74 of 78 patients (94.87%) lived on less than THB 2,000 baht per month (US$2.12 a day), which is below the WHO poverty line.[14] These patients could not afford both the surgical fee and transportation fee, even though there was a free of charge cataract surgical camp organized by the Thai monastery together with Tilganga Institute of Ophthalmology, Nepal under Dr.Sanduk Ruit. People in Lumbini province and neighboring areas knew about the camp and were willing to wait for the camp instead of seeking other options which would cost them money. The camp arranges free transportation and free food. The Thai monastery has shown a very strong social-community support for the people of Lumbini.

In Aranyaprathet, 30.38% of the patients are living under the poverty line. This is the first time a cataract surgical camp was organized in Aranyaprathet through an NGO (Banphaeo General Hospital Foundation). The camp arranged free transportation only for those who needed it. Rotary Thailand together with the local officers provided social-community support for the people of Aranyaprathet.

Past and Future Development (Issue learning)

Data from The Royal College of Ophthalmology of Thailand show that the Thai government has taken several steps to reduce the prevalence of cataract in elderly patients. These include the initiation of a project "Decreasing blindness from cataracts", which included early screening, free of charge surgery and negotiations with lens companies to bring down the cost of surgery. Despite spending more than 10 billion baht (290 million USD) over 7 years, the prevalence of severe-blinding cataract did not decrease. In 1994, the incidence of blindness was 0.31%, 74.7% of cases was caused by cataract and 134,000 cataracts patients were waiting for surgery. In 2007, the incidence of blindness was 0.59%, 51.6% of which was caused by cataract and 98,336 cataracts patients were waiting for surgery. In 2012, the incidence of blindness was 0.6%, 69.7% of which was caused by cataract and 70,071 cataracts patients were waiting for surgery. More than half of all cases of blindness in Thailand is caused by cataracts and the incidence of blindness in Thailand still exceeds the WHO objective of less than 0.5%. Reasons for this include low accessibility to healthcare, mismanagement in prioritizing cataract case according to severity and need for surgical intervention, non-appropriated distribution of cataract surgical centers and uneven distribution of ophthalmologists. Data showed that most ophthalmologists work in Bangkok or large cities and consequently there is an estimated shortage of 110 ophthalmologists in rural areas. Nowadays, in Thailand there are 50 ophthalmology graduates each year. This may help fill the shortage but this will only benefit rural areas if the model of resource allocation and distribution of ophthalmologists per population served is applied.[15]

Our study in Aranyaprathet showed that despite free of charge cataract surgery, good transportation to a nearby hospital with 2 ophthalmologists available, low waiting time for surgery and only two visits before the surgery, patients still cannot assess cataract surgery equitably. The main reason was information failure; patients did not know that there was treatment available or did not know how to get through the system. Hospitals, local authorities, patients, and patients' family members need to work together. Although the cataract surgical camp services do provide an innovative solution in bringing cataract surgery to under-privileged area in both low and high-middle income countries, they require the cooperation of professional organizations and NGOs in establishing a public-private partnership for their application on a larger scale. The successful implementation and execution of cataract surgery camp services relies largely on collaborative efforts of the following.[16]

1. Professional ophthalmologist Association
2. Non-government organization (NGOs)
3. Government sector
4. Local civil society

Conclusion

Aside from differences in income and quality of life, the barriers to the uptake of cataract surgery are different in Lumbini, Nepal and Aranyaprathet, Thailand. Lumbini patients are mostly concerned about the cost; other barriers seem to be manageable with the support from family, society and non-governmental organizations. While in Aranyaprathet, although there were no barriers regarding affordability, other factors emerged such as information failure—patients do not know that there is available treatment and do not know how to get through the system. This can be managed if patients are provided with health-related information. Although cataract surgical camp services provide an innovative solution in bringing cataract surgery to under-privileged areas in both low and high-middle income countries, they require the cooperation of professional organizations and NGOs in establishing a public-private partnership for their application on a larger scale.

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