

A Multicenter Prospective Cohort Study of Quality of Life and Economic Outcomes after Cataract Surgery in Vietnam

The VISIONARY Study

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Purpose: To measure the change in quality of life and economic circumstances after cataract surgery and identify the predictors of an improvement in these outcomes.

Design: A multicenter, prospective, longitudinal cohort study.

Participants: Participants aged ≥ 18 years were recruited to the study if the clinical assessment of their best-uncorrected vision was $\geq 6/18$ in the better eye because of cataract.

Methods: Cataract surgery.

Main Outcome Measures: Data were collected on quality of life and a multidimensional assessment of household economic circumstances (work status, income, asset ownership, household economic hardship, and catastrophic health expenditure).

Results: At 12 months follow-up, 381 of 480 participants were re-interviewed, and all had undergone surgery. There was a significant improvement in quality of life. Household economic circumstances also improved (mean change paid work participation/month: 44.5 hours, $P < 0.0001$; mean change unpaid work participation/month: 89.5 hours, $P < 0.0001$; change in proportion with hardship: -17% , $P < 0.0001$; and change in proportion with catastrophic health expenditure: -7% , $P = 0.02$). Improvements were most likely in near-poor households and were related to the type of surgery and complications after surgery.

Conclusions: This research showed that cataract surgery is associated with meaningful improvements in quality of life and household economic circumstances that are indicative of positive transitions out of poverty. Given the unmet need for cataract surgery in low- and middle-income countries where cataract impairment is substantial, this research demonstrates the potential of a relatively simple, low-cost health intervention to greatly improve household economic circumstances. *Ophthalmology* 2014;■:1–9 © 2014 by the American Academy of Ophthalmology.



*Supplemental material is available at www.aajournal.org.

The empirical evidence on the outcomes of cataract surgery in low resourced settings has mainly focused on quality and surgical outcomes^{1–3} and on the impact of improved vision on health and social outcomes, such as quality of life,^{4,5} the avoidance of injuries,⁶ and enhanced social engagement.⁷ Indeed, evidence on the association between low vision, regardless of the cause, and impaired quality of life and functional capacity has helped to support the case for the expansion of services in low- and middle-income countries,⁸ as has evidence on the cost-effectiveness of surgery in these settings.^{9,10} Despite this, access to and availability and affordability of cataract procedures still remain limited in these settings, and many individuals continue to live with avoidable blindness.¹¹

The impact of low vision can have profound economic effects for individuals and their households.^{12,13} This is explained partly by the vicious cycle of illness-induced poverty, where impaired vision and related illness can reduce opportunities for productive employment, leading to poor economic circumstances and further impoverishment from the costs associated with treatment. Breaking this cycle of poverty and blindness is a priority for the elimination of avoidable blindness globally¹⁴ and is vital for progressing economic development in low- and middle-income settings.

In the few studies that have examined the relationship between surgery and poverty alleviation, cataract surgery was shown to increase per capita expenditure and time in productive work.^{15,16} However, longer follow-up, which is

often costly and not feasible in these settings,¹⁷ is needed to determine the impact of surgery on poverty and whether the effect is sustained. This raises 2 issues for research on this topic. First, in the absence of longitudinal data, a multidimensional approach to measuring economic well-being, using interim economic and social outcomes, will provide evidence of positive transitions out of poverty. Second, incorporating a broader range of outcomes, such as quality of life, work status, income, economic hardship, and the affordability of cataract surgery, acknowledges the social determinants of low vision and provides a comprehensive picture of the impact of surgery on household economic circumstances and ultimately on its relationship to the alleviation of poverty.¹⁸

The economic impact of vision impairment due to cataracts can be particularly catastrophic in Vietnam given poor access to necessary, timely, and affordable health care, the absence of social security safety nets, and the existence of a complex health insurance system that still relies heavily on out-of-pocket costs to fund medical care. Data on the individual economic outcomes and quality of life associated with cataract surgery are needed to inform priority-setting, health care planning, and further investment in eye-health services.

The *investigating the psychological and economic impact of cataract surgery (VISIONARY)* study in Vietnam was a multicenter prospective longitudinal cohort study that aimed to measure the change in quality of life and economic circumstances associated with cataract surgery and to identify the predictors of an improvement in these outcomes in a cohort of participants in Vietnam.

Methods

Ethical approval was obtained from the University of Sydney (13407), and all study participants provided written informed consent using certified translations of approved participant information and consent forms.

The methods have been published.¹⁹ VISIONARY was a multicenter prospective longitudinal cohort study conducted in 4 provinces of Vietnam: Hue, Binh Dinh, Vinh Long, and Thai Binh. Health centers in each Province provide eye health services and coordinate regular eye health outreach, screening, and referral services in regional and rural areas. Individuals also can present directly to a health center for referral for surgery. Cataract surgery is free of charge, partially covered by health insurance, or paid in full by individuals (i.e., out-of-pocket costs), depending on the insurance status of the patient ([Supplementary Background](#), available at www.aajournal.org).

Consecutive participants were recruited between April and November 2011 by ophthalmic staff from vision outreach programs and the health facility in each region. Uncorrected vision (i.e., without spectacles) was measured in full daylight using a Landolt tumbling “C” eye chart on one side and measured at a 5-m distance. Vision <3/60 was assessed using the detection of counting fingers, hand motion, light perception, and no light perception from a 1- or 3-m distance. At the health facilities, uncorrected vision was measured using a Landolt or Snellon tumbling “E” chart, hung on the wall and read from a 5-m distance, with or without electric lamp backlighting. In Vietnam, it is standard practice for vision to be tested without correction. Vision in the better-seeing eye was used to characterize the level of vision impairment.

Participants aged ≥ 18 years were recruited to the study if the clinical assessment of their best uncorrected vision was $\leq 6/18$ in the better eye and they had not had prior cataract surgery.

Each facility provided 2 common cataract procedures: extracapsular cataract extraction, also called “small incision cataract surgery,” or phacoemulsification. The cost of the surgery was set by each facility on the basis of the relevant health treatment cost circular of the government.

Consented participants were interviewed face-to-face at baseline after vision testing, and follow-up interviews were conducted in each participant’s home at 6 and 12 months after referral for cataract surgery. Structured questionnaires were used to collect data on sociodemographics, household economic circumstances, medical history, health service use, out-of-pocket costs, health-related quality of life (measured using the Short Form 12 version 2 tool—Quality Metric, www.qualitymetric.com), and psychologic well-being.²⁰ Best uncorrected vision was measured by ophthalmic staff during follow-up interviews as described earlier. Vision was recorded as the logarithm of the minimum angle of resolution. The logarithm of the minimum angle of resolution is a continuous score; a smaller value equates to better vision (i.e., 0 = 20/20). The study tools were developed and pilot tested with study investigators in Vietnam to ensure acceptability and applicability. All materials were developed in English, and certified Vietnamese translations were produced.

The primary outcome was health-related quality of life, measured using the Short-form 12v2 questionnaire from which a physical component score (PCS) and mental component score (MCS) are calculated. A validated Vietnamese translation of the tool was used.²¹

The secondary outcome was a multidimensional assessment of household economic circumstances, measured with the following outcomes: (a) work participation; (b) income; (c) asset ownership; (d) economic hardship, and (e) catastrophic health expenditure.

- A. Work status: Average number of hours in paid and unpaid work in the previous month.²²
- B. Income: Self-reported estimate of annual household income from all sources. Equivalized income was calculated to account for the household composition²³ and is reported as annual income. Data collection at baseline and 12-month follow-up occurred at the same time of year; thus, it is unlikely that seasonal differences in income and work status affect these data.
- C. Asset ownership: Self-reported value of household non-livestock (i.e., land, motorbikes) and livestock assets.²⁴
- D. Economic hardship (hardship hereafter): A measure constructed using questions about failure to pay basic living and medical expenses and whether assistance was needed to pay these expenses.^{22,25,26} Hardship was a dichotomous variable where a reported inability to make a payment or the need for assistance was classed as a case of hardship.
- E. Catastrophic health expenditure: A measure of the burden of out-of-pocket costs for surgery, defined as total health expenditure that exceeded 30% of household income.²⁷

Sample size was calculated to detect an improvement in health-related quality of life after cataract surgery. By assuming a loss to follow-up rate of 40%, 266 participants were needed to detect a 4-point difference^{28,29} in the physical functioning with 90% power, a 5% 2-sided significance level, and a standard deviation (SD) of 17. We aimed to recruit at least 400 individuals to allow sufficient numbers to investigate the secondary outcome in this analysis. Equal numbers of participants from each study site and a 1:1 ratio of participants from the vision outreach programs and those presenting directly to the health facilities were recruited.

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