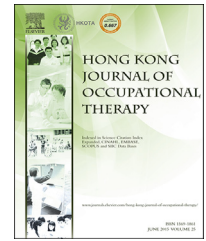




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ORIGINAL ARTICLE

# Impact of Glaucoma on Quality of Life and Activities of Daily Living



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## KEYWORDS

activities of daily living;  
glaucoma;  
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**Summary** *Objective/Background:* This study was performed to assess the associations of glaucoma with health-related quality of life (HRQOL) and activities of daily living (ADL).

*Methods:* Using data from the Korean National Health and Nutrition Examination Survey III in 2005, we analysed 9,047 participants ( $\geq 50$  years old) and 3,518 participants ( $\geq 65$  years old) to assess the associations of glaucoma with HRQOL and ADL, respectively. The diagnosis of glaucoma was based on questionnaires. HRQOL was evaluated by the EuroQol five-dimension descriptive system (EQ-5D) and the EuroQol visual analogue scale. The ADL was evaluated by the Korean-optimised ADL questionnaire. Logistic-regression analyses were used to assess the associations of glaucoma with HRQOL and ADL.

*Results:* The glaucoma patients showed lower HRQOL and ADL scores compared to the healthy participants. The glaucoma patients showed significantly higher prevalence of impaired health status in all dimensions of EQ-5D, as well as in the “bathing” dimension of ADL as compared with the healthy participants. Impaired HRQOL and ADL were significantly associated with the risk of glaucomatous status (odds ratio [95% confidence interval] of EQ-5D: 1.65 [1.33, 2.05], EuroQol visual analogue scale: 1.75 [1.43, 2.15], and ADL: 2.04 [1.12, 3.74]).

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*Conclusion:* In line with previous studies conducted in other countries, Koreans with glaucoma had impaired HRQOL and ADL as compared with healthy Koreans.

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## Introduction

Vision impairment, or low vision, is an important issue to occupational therapists because it greatly affects occupational performance and daily life (Markowitz, 2006). Glaucoma is a leading cause of visual impairment (Resnikoff et al., 2004). It has been reported that 12.3% of existing blindness of the world resulted from glaucoma. According to the Korean Health Statistics 2008 (Korean Centers for Disease Control and Prevention, 2009), 3.5% of the Korean population aged 40 years or older had glaucoma. The prevalence of glaucoma in the Korean population is one of the highest in the world (Korean Centers for Disease Control and Prevention, 2009; Quigley & Broman, 2006). A prevalence model developed by Quigley and Broman (2006) predicted that the worldwide prevalence of glaucoma will increase with the ageing of the population, so glaucoma-caused vision loss may become one of the major concerns in public health.

The irreversible damage of glaucoma generally leads to typical changes in optic-disc morphology and visual function (Jampel et al., 2002). Glaucoma-induced visual impairments are associated with the decline in physical and social functioning, bodily pain, mental health (Cypel et al., 2004), higher rate of falls, and falls with injury (Black, Wood, & Lovie-Kitchin, 2011). It has been well documented that glaucomatous status can cause impaired health-related quality of life (HRQOL; Aspinall et al., 2008; Cypel et al., 2004; Freeman, Munoz, West, Jampel, & Friedman, 2008; Gutierrez et al., 1997; Nah, Seong, & Kim, 2002; Parrish et al., 1997; Severn, Fraser, Finch, & May, 2008; Sherwood et al., 1998; Wilson et al., 1998). It is also known that glaucoma is associated with activities of daily living (ADL), which are typically automatic and solitary (Knudtson, Klein, Klein, Cruickshanks, & Lee, 2005; Noe, Ferraro, Lamoureux, Rait, & Keeffe, 2003). Most of the research on the associations of glaucomatous status with HRQOL and ADL have been performed in Western and developed countries (Cypel et al., 2004; Freeman et al., 2008; Gutierrez et al., 1997; McKean-Cowdin, Wang, Wu, Azen, & Varma, 2008; Noe et al., 2003; Parrish et al., 1997; Sherwood et al., 1998; Wilson et al., 1998), despite the high prevalence of glaucoma in Asian populations. Furthermore, their study participants were limited to those who visited local hospitals or resided in a local area. Because these approaches may lead to a selection bias, representative population data should be used.

Thus, we aimed to assess the associations of glaucoma with HRQOL and ADL in the representative Korean adult population, using the data of the Third Korea National Health and Nutrition Examination Survey (KNHANES III).

## Methods

The present study used data from the KNHANES III, a national representative survey of South Korea conducted in 2005. With the assistance of trained research staff, the participants of KNHANES III provided their "basic information" (i.e., age, household income) and their "health consciousness and behaviours" (i.e., smoking, alcohol consumption, weight control), and completed "medical examination" (i.e., anthropometric measurements, blood analyses) and "health interview" (i.e., restricted activity, quality of life, disease, medical use). "Health interviews" were supposed to be taken in all participants, while "health consciousness and behaviours" and "medical examination" were conducted only on one-third of the total target population. A more detailed description of the design is shown in another report (Park, Yoon, & Oh, 2011).

To assess the association between glaucoma and HRQOL, we focused on the adult population (50 years or older) that completed the health interview. Amongst them, the completely blind participants were excluded from the present study. Thus, we evaluated 9,047 participants (4,027 men and 5,020 women;  $\geq 50$  years old) who completely responded to the related questionnaires: glaucoma, EuroQol five-dimension descriptive system (EQ-5D), and visual analogue scale (EQ-VAS). However, KNHANES III surveyed ADL only in the elderly (65 years or older). Thus, to assess the association between glaucoma and ADL, we evaluated 3,518 participants (1,413 men and 2,105 women;  $\geq 65$  years or older). Thus, to assess the association between glaucoma and ADL, we evaluated 3,518 subjects (1,413 men and 2,105 women;  $\geq 65$  years old) who completely responded to the related questionnaires: glaucoma and ADL.

Glaucoma was defined as present when the glaucomatous status of a participant was diagnosed by a physician and when the participant was currently under treatment or not recovered from the glaucomatous status. In the EQ-5D questionnaire (The EuroQol Group, 1990), the health condition of the participants was classified into three statuses (no problem, some problems, and severe problems) in each of the five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. Based on those five classified scores, a single index of HRQOL (ranges from  $-0.171$  to 1) was calculated according to the validated guidelines and algorithms (Nam, Kim, Kwon, Koh, & Poul, 2007). In this HRQOL utility score, negative levels indicate quality of life worse than death, and 1 indicates no problems in any dimensions of the EQ-5D. A higher HRQOL utility score represents a better perceived health. The EQ-VAS was recorded for their self-rated health from 0 (worst imaginable health) to 100 (best imaginable health; The EuroQol Group,

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