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**The impact of visual impairment on quality of life among
older persons in rural Northeast Thailand**

**A thesis presented in fulfilment of the requirements for the degree of
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ABSTRACT

Worldwide, those who are visually impaired are found to be older, in poorer health and less well-off economically than those who are not. The majority live in developing countries with the highest proportion found in Southeast Asia. Visual impairment has been found to have an overwhelmingly negative impact on quality of life (QOL) among those so affected. Thus, the rate of visual impairment among older Thais living in rural areas of Northeast Thailand, the poorest and most rural region in the country, is expected to be high and QOL to be low.

This study examined the rate of visual impairment and its impact on QOL among a representative sample of older persons living in rural areas of Northeast Thailand along with other variables thought to impact QOL. As expected, a high rate of visual impairment was found in this area. Those who were visually impaired were found to be significantly older, worse off economically and to have lower overall perception of health than those who were not. As also expected, they were found to be worse-off on all of the measures of QOL assessed. However, when age, overall perception of health and economic status were controlled for, no differences on QOL were found between those who were visually impaired and those who were not. Visual impairment, therefore, was not found to have the overwhelmingly negative impact on QOL expected. This finding was unique to this study but not altogether surprising as the lifestyle of these participants was very different than that of those previously studied. Older Thais in rural areas primarily live in extended families with their care provided for by their children as a matter of respect. The assessment of other variables thought to impact QOL revealed that overall perception of health, physical health, psychological well-being, environment and intimacy were found to

make a unique contribution to variance in QOL among the sample as a whole. Recommendations to improve the environment, including economic conditions, and physical health for all were made as a means to improve QOL for those who were visually impaired as well.

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LIST OF ACRONYMS

ADL	Activities of Daily Living
AMD	Age-related Macular Degeneration
ANOVA	Analysis of Variance
ANCOVA	Analysis of Covariance
BMI	Body Mass Index
EUREYE	The European Eye Study
GDP	Gross domestic product
HCIS	Health Centre Information System
IADL	Instrumental Activities of Daily Living
ICF	The International Classification of Functioning, Disability and Health
MUHEC	The Human Ethics Committee of Massey University Human Ethics Committee
NEI-VFQ-25	National Eye Institute Visual Functioning Questionnaire - 25
QOL	Quality of Life
SD	Standard Deviation
SEE	The Salisbury Eye Evaluation Study
SPSS	The Advanced Statistics Package for the Social Sciences
UNFPA	The United Nations Population Fund
VI	Visual Impairment
WHO	The World Health Organization
WHOQOL-BREF	The World Health Organization Quality of Life-BREF
WHOQOL-OLD	The World Health Organization Quality of Life-OLD

CHAPTER 1

INTRODUCTION

1.1 Introduction

The population throughout the world is growing older with the number of people aged 60 years and older expected to triple by 2050; Thailand is no exception (United Nations, 2001). According to the United Nations, the proportion of the Thai population aged 60 and older rose from 5% to 8.1% between 1975 and 2000 and is expected to reach 25% by 2040 (United Nations Development Programme, 2005). The increase in the proportion of older persons in this country is most likely due to a decrease in birth rate, an increase in life expectancy and a decrease in the mortality rate resulting from steadily improving healthcare systems (Institute for Population and Social Research of Thailand, 2006; Knodel & Chayovan, 2009; UNFPA, 2006; WHO, 2000). The ever increasing proportion of older persons in the population poses a great challenge to the public health system (Ministry of Public Health of Thailand, 2008). With increasing age comes a decline in physical function and an increase in the prevalence of chronic diseases such as Alzheimer's disease, cancer, diabetes, cardiovascular problems, and other disabling conditions (Boult et al., 2009).

One of the critical age-related disabilities that older people may experience is visual impairment resulting in a functional limitation. It is estimated that there are approximately 285 million people worldwide who are visually impaired (i.e. have a functional limitation resulting from visual impairment); 246 million of whom have low vision and 39 million are blind (Pascolini & Mariotti, 2011; WHO, 2011).

However, the prevalence of visual impairment is not distributed equally throughout the world, but varies considerably from region to region.

The World Health Organization (WHO) (2011) states that more than 90% of the world's visually impaired population live in developing countries. It is estimated that approximately 14 million people in Southeast Asia are either blind or have low vision (i.e. are visually impaired). However, the prevalence may vary greatly by country even in the same part of the world (Keeffe, Konyama, & Taylor, 2002; Resnikoff et al., 2004). For example, the prevalence of visual impairment has been reported to be 9.2% in Malaysia (Rozhan, Halim, & Shamsul, 2009), 19.8% in Indonesia (Saw et al., 2003), and 40.4% in Myanmar (Casson et al., 2007). Therefore, it is difficult to apply these global figures to estimate the size of the problem in a specific population in any given country.

The prevalence of visual impairment is also found to increase dramatically with increasing age (Horowitz, Brennan, & Reinhardt, 2005; Jin & Wong, 2008; Massof, 2002; Michon, Lau, Chan, & Ellwein, 2002; Resnikoff, Pascolini, Mariotti, & Pokharel, 2008; Rozhan et al., 2009; Song et al., 2010; Zhao et al., 2010). For example, the prevalence of visual impairment for older adults in Hong Kong was found to increase from 22.7% for those aged between 60 and 69, to 38.0% for those aged between 70 and 79, and 48.0% for those aged 80 and older (Michon et al., 2002).

Those who are visually impaired are also more likely to be female, poor, and to live in rural areas (Dandona & Dandona, 2006b; Resnikoff et al., 2004; J. J. Wang, Mitchell, Smith, Cumming, & Attebo, 1999; Zhao et al., 2010). Furthermore, the prevalence of visual impairment is found to vary depending on the definitions used (Dandona & Dandona, 2006a; Horowitz et al., 2005). These may include minimum

measures of visual acuity ranging from 6/12 to 6/24 (Foran, Wang, Rohtchina, & Mitchell, 2000) or various measures of self-reported visual impairment e.g. “Do you have difficulty with seeing to the degree that it interferes with your daily life?” (Iliffe et al., 2005; La Grow, Sudnongbua, & Boddy, 2011), “Are you unable to read ordinary print even with wearing glasses?” (Horowitz et al., 2005; Massof, 2002), “How is your eye sight?” (Jin & Wong, 2008), and “Have you been told by a doctor, nurse, or health worker that you had a sight impairment?” (La Grow, Alpass, & Stephens, 2009). This study will determine the rate of both assessed and self-reported visual impairment among older persons living in a rural area of Northeast Thailand, as well as the impact of, and role, that visual impairment plays in determining quality of life (QOL) in this population.

1.2 Standard measures of visual impairment by visual acuity and visual field

People are considered to be visually impaired if their assessed visual acuity or visual field does not exceed a specified standard (La Grow, 1992). The standard for normal visual acuity is referred to as 6/6, meaning that the smallest line of print on the chart that can be clearly discerned by an individual at 6 metres is the same one that people with normal vision can see at that distance. The acuity measure of 6/12 means that the smallest line discernible at 6 metres is the same one that people with normal vision can see at 12 metres. Likewise, a measured acuity of 6/18 means that the smallest line discernible at 6 metres by an individual is the same one that people with normal vision can see at 18 metres (La Grow, 1992).

The standard of 6/12 and 6/18 are both used as measures to define those who are visually impaired (i.e. no better than 6/12 [6/18] in the better eye even when

wearing corrective lenses). The standard of 6/12 is often used in Australia, the U.K., and the U.S.A. to identify those who are visually impaired (Charles, 2007; Chia et al., 2004; Keeffe, Jin, Weih, McCarty, & Taylor, 2002; Prevent Blindness America, 2008; J. J. Wang et al., 1999), while the acuity of 6/18 is used in many other countries (Evans et al., 2002; Wu, Nemesure, Hennis, & Leske, 2009). Different definitions of visual impairment make it difficult to compare the prevalence rate across the nations (Keeffe, Konyama, et al., 2002).

According to the WHO (2003), people are visually impaired if they have a visual acuity of less than 6/18 in the better eye or a visual field that does not exceed 10 degrees at its widest angle. The definition of visual impairment promoted by WHO has 5 categories: (1) moderate visual impairment with presenting visual acuity from 6/18 to 6/60; (2) severe visual impairment with presenting visual acuity from 6/60 to 3/60; (3) blindness with presenting visual acuity from 3/60 to 1/60; (4) blindness with presenting visual acuity worse than 1/60 to no light perception; and (5) blindness with no light perception at all (WHO, 2003).

The normal field of vision is 180 degrees, that is, 90 degrees from the vertical and horizontal planes of the eyes. The actual arc of vision for most people is about 165 degrees. Approximately 15 degrees of visual field is obscured by the nose, cheeks, and eyebrows (La Grow, 1992). The definition of visual impairment used in Thailand is a visual acuity of 6/18 or worse in the better eye even when wearing glasses or contact lenses, or a field of vision of less than 30 degrees at its widest angle (Royal Thai Government, 1994). People are considered to be visually impaired in the current study if they meet either of these criteria.

1.3 Self-reported visual impairment

Self-reported visual impairment is also used to identify those who are visually impaired. In this case, people are considered to be visually impaired if they report having difficulty seeing to the extent that it interferes with their performance of activities of daily living in some way (e.g. ability to get around, looking after their appearance, operating household appliances, reading books or newspapers, reading labels or instructions, cooking, cleaning etc.).

Advocates for the use of self-reported visual impairment are concerned that a system of classification which relies on clinical assessment of acuity and field only may underestimate the prevalence of visual impairment and the extent of the consequences it has on performing everyday activities (Bekibele & Gureje, 2008b; Evans et al., 2002; Horowitz et al., 2005; Rubin et al., 2001).

Self-reported visual impairment is often reported in response to a single question such as “How is your eye sight?” (Jin & Wong, 2008), “Are you unable to read ordinary print even with wearing glasses?” (Horowitz et al., 2005; Massof, 2002; Rubin et al., 2001), “Do you have difficulty with seeing to the degree that interferes with your daily life?” (Iliffe et al., 2005; La Grow, Sudnongbua, et al., 2011), and “Have you been told by a doctor, nurse, or health worker that you have a sight impairment?” (La Grow et al., 2009).

In this study, self-reported visual impairment will be defined by the response to the question: “Do you have difficulty with seeing to the degree that it interferes with your daily life?” Those who answer “yes” to this question will be classified as having self-reported visual impairment.

1.4 Causes of visual impairment

As people age, vision may become less acute. Age-related vision changes can result from both normal and pathological changes in the eye (Brennan & Silverstone, 2000). Normal changes in the eye associated with aging include the pupil becoming smaller and less responsive to light, the lens of the eye becoming yellowed and less elastic, the ciliary body producing fewer tears, and the retina becoming slower in adapting to changing levels of light. These changes may result in age-related refractive error (i.e. presbyopia), decreased contrast sensitivity, colour perception and depth perception, increased need for light, difficulty with glare, difficulty with light adaptation, and dry eye (Orr & Rogers, 2001; C. Zhang et al., 2008). In addition, pathological changes in the eye resulting from age-related macular degeneration (AMD), cataract, glaucoma, and diabetic retinopathy are common (Shoemaker, 2002). All may contribute to a reduction in visual functioning.

However, it should be noted that about 85% of all visual impairment is preventable or treatable (i.e. refractive error and cataract) (WHO, 2011). According to the WHO (2011), the most common causes of visual impairment throughout the world are uncorrected refractive errors including presbyopia, followed by cataracts, glaucoma, AMD, and diabetic retinopathy.

1.4.1 Uncorrected refractive error

Uncorrected refractive error is the most common cause of visual impairment in the world (Pascolini & Mariotti, 2011; WHO, 2011). Approximately 153 million people throughout the world are estimated to be visually impaired due to uncorrected refractive errors, and of those, 8 million are blind (Holden et al., 2008; Resnikoff et al., 2008). The most common types of refractive error are myopia (being nearsighted) and hyperopia (being farsighted). Myopia is a condition of the eye that occurs when

light entering the eye does not correctly come to focus on the retina but focuses in front of it due to too much refractive power, or the eye being too long. People with myopia have difficulty seeing distant objects, while tasks that require near vision are unaffected. Hyperopia is a condition of the eye which occurs when light entering the eye conceptually comes to focus at a point behind the retina instead of directly on it due to too little refractive power, or the eye being too short. People with hyperopia have difficulty seeing near objects clearly, while tasks that require distance vision are unaffected (Kasthurirangan & Glasser, 2006). Presbyopia (hyperopia due to the loss of the elasticity of the lens associated with aging) is the most common cause of refractive error occurring among the visually impaired in the world (WHO, 2011).

Uncorrected refractive error is particularly prevalent in developing countries, especially in Latin America, Africa, and Asia (Dandona & Dandona, 2006b; Dineen et al., 2007; Holden et al., 2008; Keeffe, Konyama, et al., 2002; Saw et al., 2003; Wong et al., 2008; Wong, Loon, & Saw, 2006). The prevalence of uncorrected refractive error, for example, is found to range from 48.0% in Uganda (Kamali et al., 1999) to 54.7% in Brazil (Duarte, Barros, Dias-da-Costa, & Cattan, 2003), 55.3% in India (Nirmalan, Krishnaiah, Shamanna, Rao, & Thomas, 2006), and to 61.7% in rural Tanzania (Burke et al., 2006).

Although most refractive errors can easily be corrected by glasses or contact lenses, they often go untreated, especially in the poorest and least developed countries (Dandona & Dandona, 2006b; Holden et al., 2008; Smith, Frick, Holden, Fricke, & Naidoo, 2009) due to cost, affordability, and insufficient numbers of health care professionals to perform relevant eye examinations and prescriptions (Dandona & Dandona, 2006b; Holden et al., 2008; Resnikoff et al., 2008; Smith et al., 2009).

1.4.2 Cataracts

Cataract is the second most common cause of visual impairment in the world (Pascolini & Mariotti, 2011; WHO, 2011). It is an age-related condition in which the lens of the eye becomes clouded, or opaque, and blocks light from reaching the retina. Cataracts may result in blurred vision, glare, and even blindness. Many people develop cataracts as a result of the normal aging process. In Australia, for example, the prevalence of cataracts has been found to double with each decade of age after 40 years (Brian & Taylor, 2001; Ng, Liang, & Pang, 2012).

There are other causes of cataracts including glaucoma, diabetes, exposure to the sun or radiation, cigarette smoking, alcohol intake, medications, trauma, and diet (Lee, 2007; Shoemaker, 2002). Cataracts can usually be treated with surgery. However, in some parts of the world, especially in developing countries, there are many barriers such as surgical costs, distance, lack of service awareness or lack of support for the availability of, or access to, cataract surgery (Lee, 2007). In India, for instance, untreated cataract accounted for 60.8% of those presenting with visual impairment (Thapa et al., 2011). The age-adjusted prevalence of cataracts in India is found to be three times higher than that found in the U.S.A. (Ng et al., 2012).

In the U.S.A., according to the Eye Diseases Prevalence Research Group (2004), cataracts affect approximately 20.5 million Americans aged over 40 years. African Americans are about two times more likely to develop cataracts than Caucasians. This information is similar to that found in Argentina and Guatemala in Latin America (Furtado et al., 2012).

1.4.3 Glaucoma

Glaucoma is the third most common cause of visual impairment worldwide (Pascolini & Mariotti, 2011; WHO, 2011). The prevalence of glaucoma is increasing

due to the rapidly aging population in every country. Glaucoma is a condition in which an increase in pressure of the fluid inside the eye leads to optic nerve damage, resulting in vision field loss. The causes of glaucoma remain unclear. There may be increased risk due to family history of glaucoma, age, race, myopia, eye trauma, and diabetes. However, it can be successfully treated when diagnosed early, usually with eye drops (Shoemaker, 2002). There are two main types of glaucoma; open angle and closed angle (angle closure) glaucoma. Primary open angle glaucoma is more frequent in whites, while closed angle glaucoma is more common in Southeast Asia (WHO, 2007). Quigley and Broman (2006) predicted that the number of people with glaucoma worldwide will increase from 60.5 million in 2010 to 79.6 million by 2020.

It is also estimated that almost half (47%) of the world's glaucoma population live in Asia (WHO, 2007). The prevalence of glaucoma reported recently in China (i.e. 3.8%) (Y. X. Wang, Xu, Yang, & Jonas, 2010) is almost identical to that reported in Japan (i.e. 3.9%) (Iwase et al., 2004) and higher than that found in the U.S. (i.e. 2.2%) (Prevent Blindness America, 2008) and in Australia (i.e. 3.0%) (Mitchell, Hourihan, Sandbach, & Wang, 1999) but lower than that found in Sweden (i.e. 5.7%) (Ekström, 1996) and in Africa (i.e. 7.0%) (Buhrmann et al., 2000).

1.4.4 Age-related macular degeneration (AMD)

Age-related macular degeneration (AMD) is the fourth most common cause of visual impairment among people aged 50 years or older in the world (Pascolini & Mariotti, 2011; WHO, 2011). However, it has been found to be the most common cause of visual impairment among older persons in developed countries (Chia, Mitchell, Ojaimi, Rochtchina, & Wang, 2006; Chia et al., 2004; Coleman, Chan, Ferris, & Chew, 2008; Congdon et al., 2004; Evans, Fletcher, & Wormald, 2004;

Finger, Fimmers, Holz, & Scholl, 2011; Muñoz et al., 2000; RNZFB, 2004; The SEE Project, 1997; J. J. Wang et al., 1999; West et al., 2002).

AMD is an eye condition that affects the macula, which is a part of the retina at the back of the eye. AMD may result in the loss of central vision, leaving only peripheral vision. There are two forms of AMD; the dry form, which is the most common, and the wet form, which is less common but causes more severe and sudden sight loss. The exact cause of AMD is unknown. Possible risk factors are smoking, genetics, hypertension, sun exposure, far-sightedness, and poor diet (Shoemaker, 2002).

AMD affects more than 50 million people worldwide (Congdon et al., 2004; Pascolini et al., 2004). The number affected is expected to double by the year 2020 as a result of the ageing population in the world (WHO, 2007). The overall prevalence of AMD in the US population 40 years and older was estimated to be 1.47% in the year 2004. As a result, approximately 1.75 million Americans would have had AMD in 2004. It is expected that this number will increase to almost 3 million by 2020 due to the rapid aging of the U.S. population (Prevent Blindness America, 2008). The rate of AMD has been found to increase with increasing age. For example, the rate of AMD among the older population in the U.K. is found to increase from 2% of people aged 50 and older to 8% of people aged 65 and older, and to 20% of people aged over 85 (Evans et al., 2004). The rate of AMD is also high among Asian adults. A study in Singapore, for example, reported the prevalence of AMD to be 5.7% for Indians, 7.3% for Chinese, and 7.7% for Malays (Cheung et al., 2012).

1.4.5 Diabetic Retinopathy

Diabetic retinopathy is the fifth most common cause of visual impairment worldwide (Pascolini & Mariotti, 2011; WHO, 2011). It is the most common diabetic eye disease, caused when the blood vessels of the retina initially leak and become blocked off. Diabetic retinopathy results in decreased vision and blindness. Approximately 40% of people with diabetes have at least mild retinopathy. The incidence increases with the duration of diabetes and when blood glucose cannot be controlled. Duration of diabetes, age, gender, hypertension, body mass index (BMI), and smoking are associated with the development and progression of diabetic retinopathy. Control of diabetes and regular eye examinations can delay the development of diabetic retinopathy (Shoemaker, 2002).

The prevalence of diabetic retinopathy among those with type I and II diabetes is found to range from 52.4% for Africans, 42.3% for Indians, 38.0% for white Europeans, and 28.5% for Americans (Emanuele et al., 2005; Sivaprasad et al., 2012; X. Zhang et al., 2010).

All the leading causes of visual impairment except for uncorrected refractive error are age-related. As the proportion of older people in society increases so will the rate of visual impairment.

1.5 The impact of visual impairment on quality of life

The consequences of visual impairment on quality of life (QOL) among older persons have been well established in many countries, particularly among those in the developed world. For example, the Blue Mountains Eye Study investigated issues relating to visual impairment and QOL in the Australian population (Chia et al., 2006; Chia et al., 2004; Vu, Keeffe, McCarty, & Taylor, 2005), the Salisbury Eye

Evaluation (SEE) project assessed the association between performance on everyday tasks and visual impairment for older persons in the U.S.A. (West et al., 2002) and the European Eye Study (EUREYE) examined the association between visual impairment and QOL in the older European population (Seland et al., 2009).

Regardless of the definition applied (i.e. assessed visual impairment or self-reported visual impairment), visual impairment has generally been found to contribute to a loss of independence in performing daily activities (Chia et al., 2004; Dandona & Dandona, 2006b; Keeffe, 2005), and reduced satisfaction with health (J. J. Wang, Mitchell, & Smith, 2000), emotional well-being, social relationships and social participation (Chia et al., 2006; Chia et al., 2004; Vu et al., 2005; J. J. Wang et al., 2000). All of these attributed to lower scores on measures of QOL (Dandona & Dandona, 2006b; Dandona et al., 2001; Holden, Rao, Knox, & Sulaiman, 1997; Keeffe, 2005).

However, few studies have explored the relationship between visual impairment and QOL in the developing world (Polack, Kuper, Wadud, Fletcher, & Foster, 2008). Given that QOL is defined as “individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns” (WHO, 1996, p. 5), it is difficult to extrapolate the findings of the relationship between visual impairment and QOL derived from one part of the world to another. Therefore, more country or area-specific studies are needed.

The WHO developed a generic cross cultural quality of life instrument called the World Health Organization Quality of Life-BREF (WHOQOL-BREF) as a standard measure of QOL (The WHOQOL Group, 1996) and the World Health Organization Quality of Life-OLD (WHOQOL-OLD) which is designed to

supplement the WHOQOL-BREF with additional items particularly relevant to older adults (Power, Quinn, Schmidt, & The WHOQOL-OLD Group., 2005). All domain and facet scores were reported on a 0–100 scale with a higher score indicating better QOL. The scores for all domains and facets reported here were more positive than neutral (i.e. 50 = moderate and 100 = completely).

The general norms reported for older persons aged 60 and over in Australia for four domains of WHOQOL-BREF were 69.87 for physical health, 69.58 for psychological, 70.79 for social relationships, and 75.69 for the environment domain (Hawthorne, Herrman, & Murphy, 2006). The median scores of the facets of the WHOQOL-OLD obtained from older persons aged 61 and older in 20 countries around the world were 72.52 for sensory abilities, 66.47 for autonomy, 64.29 for past, present and future, 66.07 for social participation, 63.66 for death and dying, and 62.15 for intimacy (WHO, 2006). It is predicted that the scores of QOL measures obtained in this study will be lower than those reported for other countries (see above) as this study is to be conducted among older persons living in rural areas of a developing country, where it is expected, that in general, this population will be poorer, less well educated, and in poorer health than the samples referred to above.

1.6 Other factors affecting QOL

Numerous studies have documented the impact of visual impairment on QOL (La Grow, Sudnongbua, et al., 2011; Lamoureux et al., 2009; Nutheti et al., 2006). However, QOL is also affected by other factors such as features of the person (e.g. health conditions), features of the overall context in which the person lives (e.g. personal and environmental factors), and activities and participation (Good, 2005; WHO, 1996, 2002, 2006, 2008). Those who are visually impaired have generally

been found to be older (Bekibele & Gureje, 2008b; Esteban et al., 2008; Evans et al., 2002; Horowitz et al., 2005; Jin & Wong, 2008; Michon et al., 2002; Song et al., 2010; Wong et al., 2008), disproportionately female (Wong et al., 2008), worse off economically (Horowitz et al., 2005; La Grow et al., 2009; Michon et al., 2002), in poorer health (Jin & Wong, 2008; Zimdars, Nazroo, & Gjonça, 2012), to have lower levels of education (Song et al., 2010), to have difficulty in performing activities of daily living (Bekibele & Gureje, 2008b; Chia et al., 2004; Good, LaGrow, & Alpass, 2008; Jin & Wong, 2008) and lower social functioning scores including higher rates of social isolation (Brown & Barrett, 2011; Lamoureux et al., 2009), and subsequently have lower QOL (Bekibele & Gureje, 2008b; Chia et al., 2004; Good et al., 2008; Jin & Wong, 2008) than those who are not.

Based on this literature, the definition of QOL as a multidimensional construct and the WHO model functioning (i.e. the International Classification of Functioning, Disability and Health; ICF) (WHO, 2002), this study proposes a model to illustrate the multidimensional relationships affecting QOL. This model proposes that QOL among older persons living in rural areas of Northeast Thailand can be considered as the ultimate outcome of the interactions between visual function, health status, psychological factors, environment factors, and personal factors.

It is expected that QOL will vary depending on the interactions between visual function (i.e. visual impairment and sensory abilities), health status (i.e. physical health, health conditions and overall perception of health), psychological factors (i.e. psychological, past, present and future and death and dying), environment factors (i.e. environment, social relationships and social participation) and personal factors (i.e. age, gender, economic status, and education levels, autonomy and intimacy). Therefore, it is predicted that those who have a visual

impairment will have reduced QOL as commonly reported in the literature. However, the degree of the impact of visual impairment on QOL will be modified by the other variables contained in this model. The following diagram is the model proposed in this study.

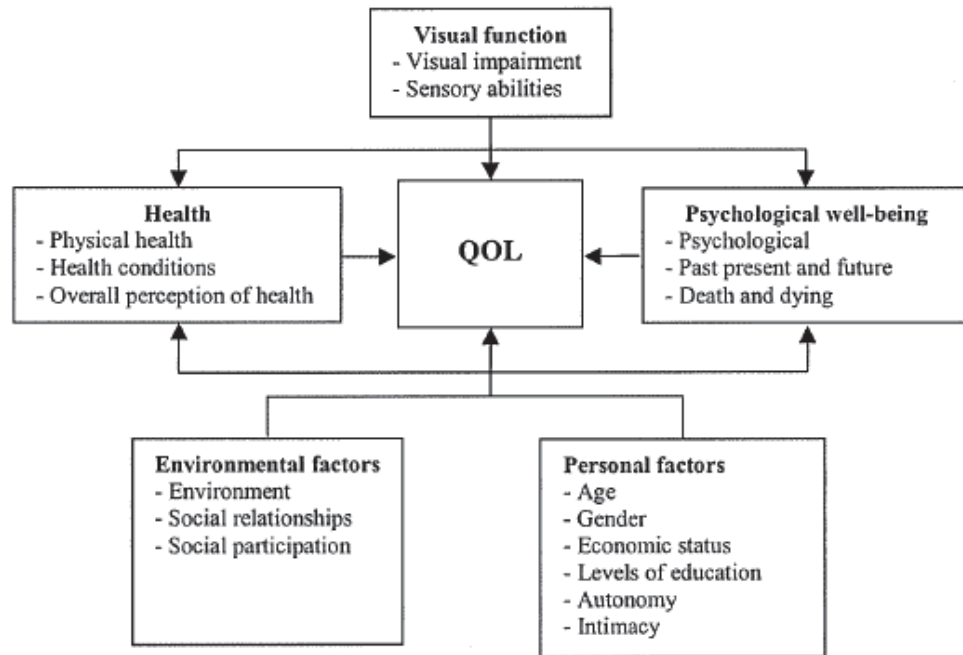


Figure 1.1: A proposed model to illustrate the multidimensional relationship affecting QOL

1.7 Visual impairment and QOL in Northeast Thailand

There is little literature about the prevalence of visual impairment and its impact on QOL among older persons in Thailand in general and rural areas in particular. The estimated prevalence of visual impairment among older persons (i.e. 60 and older) in Thailand as a whole is 22% (National Statistical Office of Thailand, 2002). There are no official estimates of the rate of visual impairment among older persons in rural Northeast Thailand. However, a study conducted to assess the impact

of feelings of abandonment among older persons in this specific area found a high rate of visual impairment (i.e. 47.8% reported as having difficulty seeing to the extent that it interfered with their daily life in this sample) (Sudnongbua, La Grow, & Boddy, 2010). This estimate is based on self-reported difficulty with seeing only. No measure of visual acuity was used, nor were any standard definitions of measured visual impairment employed. Therefore, it is difficult to make comparisons to national estimates that are based on assessed acuity.

Follow-up analysis of these data indicated that those who had difficulty seeing had lower scores on the physical health and psychological domains of the WHOQOL-BREF and the sensory abilities facet of the WHOQOL-OLD, than those who did not (La Grow, Sudnongbua, et al., 2011). However, this sample was not selected for the purpose of assessing the rate of visual impairment nor its impact on QOL in this sample. It is, therefore, hard to determine the extent to which these findings generalise to the population in this region.

1.8 Study objectives

There is little data available regarding the prevalence of visual impairment among older people in rural areas of Thailand, and no studies which have systematically examined the impact of visual impairment on QOL in this sample. The objectives of the current study are to: (1) estimate the rate of visual impairment among older persons living in Northeast Thailand (the most rural and poorest region in Thailand) using a sample specifically selected for this purpose while applying strict survey methodologies to provide accurate information; (2) determine the impact that visual impairment might have on QOL in this sample; and (3) explore the extent to which the proposed model predicts variance in overall perception of QOL

in this sample. The prevalence of visual impairment will be determined by using both self-reported difficulty with seeing and measures of visual acuity and visual field. Comparisons will also be made to determine if age, gender, education, economic status, overall perception of health, and QOL differ by visual status. A standard multiple regression analyses will be performed to identify the major contributing factors to QOL in this sample.

The findings of this study may more accurately identify the size and extent of the problems associated with visual impairment and provide essential information for the improvement of eye care and QOL for the older persons in the country.

1.9 Significance of the study

According to the literature reviewed here, those who live in rural and economically disadvantage areas experience the highest rates of visual impairment. Therefore, it is expected that the rate of visual impairment in Northeast Thailand to be found here will be higher than the rate for the country as a whole, as this region is an area with both of these features (i.e. the most rural and economically disadvantaged in the country) (Thailand's National Economic and Social Development Board, 2005). Access to optometric and ophthalmological services may be limited (Dandona & Dandona, 2006b; Holden et al., 2008; Smith et al., 2009; Wibulpolprasert, Pachanee, Pitayarangsarit, & Hempisut, 2004).

It is also expected that those who are visually impaired will be older, disproportionately female, lower levels of education, worse off economically, and in poorer health than those who are not based on the pattern normally found in the literature.

However, the negative impact of visual impairment on QOL to be found in this study may be less than that found in other countries as the structure of family, living arrangements and religious beliefs in Thailand may be more supportive than those found elsewhere. Thai adults, especially those who live in rural areas, are more likely to live communally, and less likely to become socially isolated or experience depressed states than those in developed countries, and independence may not be valued to the degree that it is among those who live in developed countries (Brown & Barrett, 2011; Knodel & Chayovan, 2009; La Grow et al., 2009; Vu et al., 2005; Wu et al., 2009).

It is also expected that visual function (i.e. visual impairment and sensory abilities), health status (i.e. physical health, health conditions and overall perception of health), psychological factors (i.e. psychological, past, present and future and death and dying), environment factors (i.e. environment, social relationships and social participation) and personal factors (i.e. age, gender, economic status, and education levels, autonomy and intimacy) will be the major contributing factors to QOL in this sample.

Yet, this is only speculation as no systematic studies have been conducted in this region with this age group. This project, therefore, is designed to study the prevalence of visual impairment among elderly people in this rural area of Northeast Thailand and to identify the impact of visual impairment on their QOL.

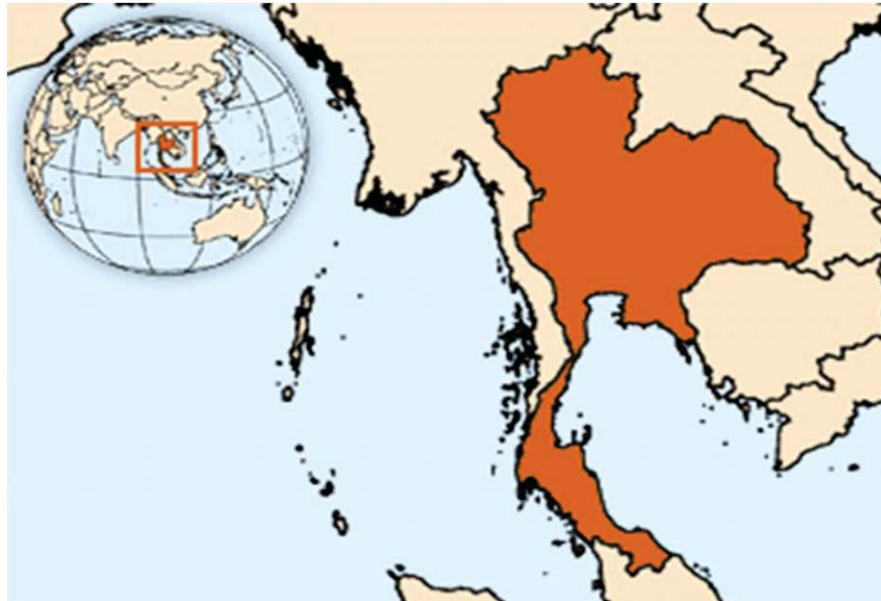
It is essential to have up to date information on both the prevalence and the impact of visual impairment on this population, in order to develop and implement policies and practices to provide treatment and services among this population. The rate of visual impairment found among older persons living in rural Northeast Thailand needs to be identified and its impact on the QOL of older people in this

region needs to be addressed. The information about the prevalence of visual impairment may be useful to those who provide eye care in rural areas of the country. Information on the impact of visual impairment on QOL may also be useful to those who provide support and services to older persons with visual impairment.

The findings from this research and reflections will be submitted to and published in both national and international journals. Furthermore, the full report will be made available to all interested organisations to provide information concerning support and services for visually impaired people in Thailand.

1.10 Study background

Thailand is located in Southeast Asia and classified as a developing country. Thailand covers a tropical land area about the size of New Zealand (514,000 km²). The country shares a long border with Myanmar and the Andaman Sea to the west, Lao People's Democratic Republic (P.D.R.) and Burma (Myanmar) to the North, Lao P.D.R. to the Northeast, Cambodia and the Gulf of Thailand to the East, and Malaysia to the South. The country is divided into four main parts; the North, the Central, the Northeast and the South. Bangkok is the capital city, located in the central region, and it is the centre of Thailand's economic and political activities. The population of Thailand is around 64 million (United Nations Development Programme, 2005). Thai is the official language of the country. Almost ninety five percent of the population are Buddhists and a little less than five percent are Muslims.



Source: WHO: Southeast Asia region: Thailand, WHO, 2012.

Recently, Thailand experienced gross domestic product (GDP) growth of 7.8% in 2010, making it one of the fastest growing economies in Asia and the fastest growing economy in South East Asia. Thailand ranks midway of the wealth spread in Southeast Asia. It is the 4th richest nation by GDP per capita, after Singapore, Brunei, and Malaysia. As a whole, the Thai government has done remarkably well with the country's development. The Thai economy has grown dramatically and poverty has been reduced (Thailand's National Economic and Social Development Board, 2005).

The government has invested in health for many decades and identified the evolution of health policy, strategy, and population health outcomes as being necessary. One of the outstanding purposes of health and social policy in Thailand is to increase the QOL for all people (Ministry of Public Health of Thailand, 2008). In addition, the government has set a policy called the 30 baht healthcare scheme, in

order to allow all people in the country access to health care and services. In spite of the gains in accessibility to health care achieved, there is still inequality across the region. The majority of health resources are concentrated in urban areas (Ministry of Public Health of Thailand, 2008).

1.10.1 Northeast Thailand

The Northeast region of Thailand consists of 20 provinces which cover a total area of more than 170,000 km² or roughly one-third of the total area of the country. The Northeast is bordered by Cambodia to the south and Lao P.D.R. to the north and east. The economy of this region relies almost exclusively on agricultural products. The rise in manufacturing has not occurred in the Northeast region to any extent. Rice is the main crop accounting for about 60% of the cultivated land. However, agriculture in this region is extremely difficult as the climate is prone to drought and the flat area is often flooded in the rainy season. In addition, the soil is highly acidic and saline making it inappropriate for farming. Low productivity leads to high poverty in this region. Therefore, this region is the poorest in the country (Thailand's National Economic and Social Development Board, 2005).

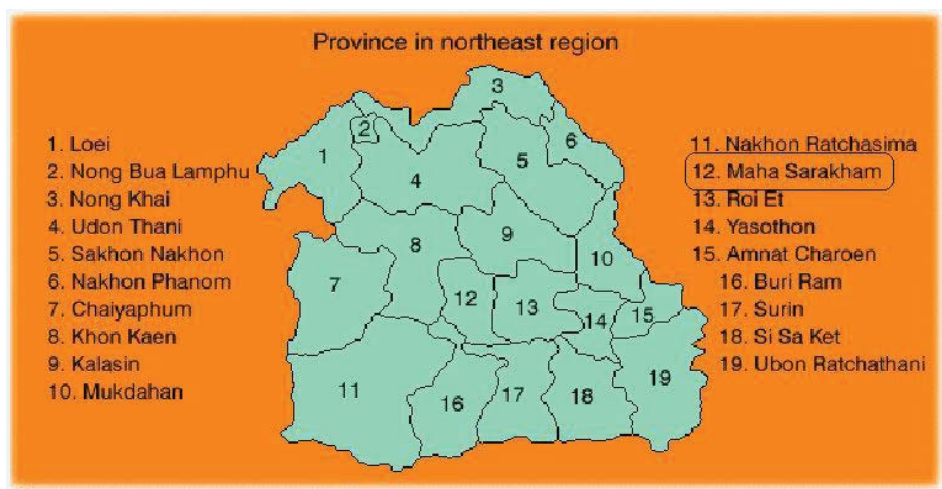
1.10.2 Maha Sarakham Province

This study was carried out in Maha Sarakham province, as this area is classified as the most rural and one of the poorest provinces in the Northeast region (Thailand's National Economic and Social Development Board, 2005). Poverty is still common in Maha Sarakham as most people live below the official poverty line of 1,338 Baht per month (54 NZ\$) (Thailand's National Economic and Social Development Board, 2005). It is expected that the rate of visual impairment in Maha Sarakham will be higher than the rate for the whole country, as it is generally found to relate to the area of residence (i.e. rural areas) and low socioeconomic status. In

addition, access to basic health services including eye care may be limited due to economic reasons (i.e. travelling and treatment costs).

Maha Sarakham is located in the middle of the region. It is around 475 km from Bangkok. The majority of the area consists of rice fields. Therefore, Maha Sarakham people are principally employed in agriculture and animal raising. Maha Sarakham is subdivided into 13 districts; Mueang Maha Sarakham as the capital district, Kae Dam, Kosum Phisai, Kantharawichai, Chiang Yuen, Borabue, Na Chueak, Phayakkhaphum Phisai, Wapi Pathum, Na Dun, Yang Sisurat, Kut Rang, and Chuen Chom (National Statistical Office of Thailand, 2001).

According to The National Statistical Office of Thailand (National Statistical Office of Thailand, 2001), the population of Maha Sarakham province in 2001 was 947,300, with 8.5 % aged 60 and older at the time of this study. There were approximately 150,000 people living in municipal areas and 800,000 in non-municipal areas (rural areas). There are thirteen districts which can be divided into four large districts that have a population of 100,000 or more, and nine small districts that have a population of 100,000 or less. For this study, it was assumed that the population in the rural areas of Maha Sarakham was 800,000 and 8.5% were aged 60 years and older.



Source: Thailand: Northeast, Ministry of Public Health, Thailand, 2008.

1.11 Summary

As the proportion of older persons in the country increases, the rate of chronic diseases and disabling conditions, including visual impairment, is expected to increase as well. Although the WHO provides estimates for the prevalence of visual impairment for all regions of the world, it is difficult to apply these global estimates to specific countries in Southeast Asia and specific region in countries. Furthermore, there is little literature about the prevalence of visual impairment and its impact on QOL among the older population in Thailand in general and rural areas in particular. It is expected that the rate of visual impairment among older persons living in rural areas in Northeast Thailand will be high, as this area is considered to be the most rural and the poorest in the country. It is also expected that the impact of visual impairment on QOL found in this study may differ from that reported elsewhere. Therefore, this study will determine the prevalence of visual impairment in this region and to investigate the impact of visual impairment on the QOL in this sample, as well as to explore the extent to which the proposed model predicts variance in overall perception of QOL in this sample.

This first chapter presented the introduction and rationale for the study, background on visual impairment, the leading causes of visual impairment, and definitions of visual impairment including those based on visual acuity and visual field, as well as those depending on self-report. A model explaining the multidimensional relationships thought to affect QOL was proposed. The geographic and socioeconomic conditions that lead to poverty for those who live in Northeast region were described. The study setting—Maha Sarakham province—was identified.

The following chapter, Chapter Two, provides an in-depth review of the literature investigating prevalence and factors related to visual impairment, as well as those studies which have investigated the impact of visual impairment on QOL and the factors related to QOL. The lifestyle of older Thais is reviewed with particular emphasis on those living in rural areas.

Chapter Three provides the methodology employed in this study including the design, study population, sample size, sampling stages and process for the selection of participants, procedure and data collection instruments, steps of data collection, data management and data analysis, as well as ethical consideration.

Chapter Four provides the results of the statistical analysis of the survey data. Descriptive details about the participants and the prevalence of visual impairment, as well as comparisons of demographic information of those who are visually impaired and those who are not, and the impact of visual impairment on QOL are reported.

Chapter Five provides a discussion of the findings in relation to the literature and previous studies. The findings of this study include the rate of visual impairment, the impact of visual impairment on the QOL, and the factors affecting the QOL among this population which may be useful to those that support and provide services to older persons with visual impairment.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Introduction

In this chapter the literature on visual impairment is reviewed in terms of the prevalence of, and factors related to, visual impairment, as well as the impact of visual impairment on QOL, with a particular focus on older persons as a basis to provide the background and justification for the current study. Studies from both developed and developing countries were reviewed.

Studies reviewed here were selected from those published in English in refereed journals from 2002 to present. Thirteen studies were selected from all published studies which identified the rate of visual impairment among older adults living in communities. Two studies included persons from the age of 40. However, the information considered for this review was taken for those participants aged 60 years and older in all cases.

Sixteen studies were selected from all studies which investigated the impact of visual impairment on QOL among older adults (60 and older). The latter compared those who were visually impaired and those who were not with variables thought to impact on QOL in older persons. In addition, literature regarding the lifestyle of older Thais living in rural communities was also reviewed. The literature review here informed the research questions and the design and methods used for this study.

2.2 Factors influencing the prevalence of visual impairment among older persons

As can be seen in Table 2.1, studies reviewed here investigated the prevalence of visual impairment among older people living in the community in 13 different countries. Some studies were carried out nationally while others were specifically conducted in rural or urban areas of the country. The sample size of the 13 studies ranged from 190 to 14,600 with a median of 3,154. The overall rates of visual impairment reported across the 13 studies ranged from 6.9% to 55.9% with a median of 21.0%. It is revealed from this review that a number of factors, including the definition of visual impairment used, age, gender, the country of residence, education, and economic status were found to impact on the prevalence of visual impairment among this population.

2.2.1 Definition and visual impairment

The definition used has an impact on the prevalence of visual impairment reported. Definitions of visual impairment are based on either on self-reported visual disability or clinical measures of visual impairment. Clinical measures of visual impairment generally rely on measures of distance acuity and are determined by a stated lower threshold (i.e. no better than) in the better eye with correction. The two threshold levels employed in the literature reviewed here were 6/12 and 6/18. Self-reported visual disability is often documented by the participant's response to a single question regarding visual function, for example, asking, "How is your eye sight?" (Jin & Wong, 2008), "Have you been told by a doctor, nurse, or health worker that you have a sight impairment?" (La Grow et al., 2009), "Do you have difficulty with seeing?" (Bekibele & Gureje, 2008b; Horowitz et al., 2005), and "Do

Table 2.1
The prevalence of visual impairment

Author, year	Location of study	Definition	Overall sample	Visually impaired (VI)	Independent variables	Results
Chia et al., 2003	Australia	<6/12	N= 3,154 Mean age: 66.7 Range: 49-98 F= 57.0%	N= 237 Mean age: 76.8 F= 65.7%	VI: yes/no Age	Overall prevalence: 7.5%. The groups were found to differ by age. Those who were visually impaired were found to be older.
Wong et al., 2008	Urban, Singapore	<6/12	N= 3,269 Mean age: NR Range: 40-79 F= 51.9%	N= 288 Mean age: NR F= 59.5%	VI: yes/no Age Gender	Overall prevalence: 8.8%; those aged 40-49, 4.9%; 50-59, 9.3%; 60-69, 12.7%; 70-79, 15.1%. The groups were found to differ by age and gender. Those who were visually impaired were found to be older and disproportionately female.
Esteban et al., 2008	Provincial, Spain	<6/18	N= 1,144 Mean age: 73.7 Range: 65-97 F= 54.5%	N= 95 Mean age: NR F= 54.7%	VI: yes/no Age Gender	Overall prevalence: 8.3%; those aged 65-74, 5.8%; 75 ⁺ : 20.2%. The groups were found to differ by age but not gender. Those who were visually impaired were found to be older.
Oye and Kuper, 2007	Urban, Cameroon	<6/18	N= 2,215 Mean age: NR Range: 40-70 ⁺ F= 50.1%	N= 233 Mean age: NR F= 55.6%	VI: yes/no Age Gender	Overall prevalence: 10.5%. The groups were found to differ by gender but not age. Those who were visually impaired were found to be disproportionately female.

Table 2.1
The prevalence of visual impairment (continued)

Author, year	Location of study	Definition	Overall sample	Visually impaired (VI)	Independent variables	Results
Evans et al., 2002	National, Britain	<6/18	N= 14,600 Mean age: 80.3 Range: 75-90 ⁺ F= 61.5%	N= 1,803 Mean age: 83.3 F= 71.6%	VI: yes/no Age Gender	Overall prevalence: 12.4%; those aged 75-79, 6.2%; 80-84, 11.9%; 85-89, 23.4%; 90 ⁺ , 36.9%. The groups were found to differ by age and gender. Those who were visually impaired were found to be older and disproportionately female.
Song et al., 2010	Rural, China	<6/18	N= 4,956 Mean age: 58.0 Range: 40-89 F= 55.0%	N= 659 Mean age: NR F= 64.9%	VI: yes/no Age Gender Education	Overall prevalence: 19.2%; those aged 40-49, 5.4%; 50-59, 9.0%; 60-69, 22.0% and 70 ⁺ , 62.0%. The groups were found to differ by age, gender, and levels of education. Those who were visually impaired were found to be older, disproportionately female, and had less education.
Nirmalan et al., 2002	Rural, India	<6/18	N= 5,405 Mean age: 61.0 Range: 50-70 ⁺ F= 54.3%	N= 1,661 Mean age: NR F= N/R	VI: yes/no Age Gender	Overall prevalence: 30.7%. The groups were found to differ by gender. Those who were visually impaired were found to be older and disproportionately female.

Table 2.1
The prevalence of visual impairment (continued)

Author, year	Location of study	Definition	Overall sample	Visually impaired (VI)	Independent variables	Results
Michon et al., 2002	Suburban, Hong Kong	<6/18	N= 3,434 Mean age: 70.4 Range: 60-80 ⁺ F= 60.0%	N= 1,418 Mean age: NR F= 60.4%	VI: yes/no Age Gender Education Income	Overall prevalence: 41.3%; those aged 60-69, 28.3%; 70-79, 48.0%; 80 ⁺ , 73.0%. The groups were found to differ by age, gender, education, and income. Those who were visually impaired were found to be older, to have lower income, were living in public housing, were less educated, and disproportionately female.
Jin and Wong, 2008	National, Canada	Self-reported "How is your eye sight?": excellent/ good/poor/ unable to see.	N= 2,671 Mean age: 72.0 Range: 65-99 F= 61.7%	N= 184 Mean age: NR F= 69.6%	VI: yes/no Age Gender Education	Overall prevalence: 6.9%. Those aged 65-74, 5.2%; 75-84, 5.8%; 85 ⁺ , 19.2. The groups were found to differ by age and levels of education but not gender. Those who were visually impaired were found to be older, and to have lower levels of education.

Table 2.1
The prevalence of visual impairment (continued)

Author, year	Location of study	Definition	Overall sample	Visually impaired (VI)	Independent variables	Results
La Grow et al., 2009	National, New Zealand	Self-reported "Have you been told by a doctor, nurse or health worker that you had a sight impairment?": yes/no.	N= 5,975 Mean age: 61.0 Range: 55-70 F= 52.2%	N= 411 Mean age: 61.1 F= 52.3%	VI: yes/no Age Gender Economic Health Social isolation	Overall prevalence: 6.9%. The groups were not found to differ by age or gender. However, those who were visually impaired were found to be less well-off economically, in poorer health, to have less social support, and to be more socially isolated than those who were not.
Horowitz, Brennan, and Reinhardt, 2005	Nationwide U.S.A.	Self-reported "Do you have difficulty with seeing?": yes/no.	N= 1,005 Mean age: 61.0 Range: 45-75+ F= 54.2%	N= 169 Mean age: NR F= 62.1%	VI: yes/no Age Gender Education Employment Income	Overall prevalence: 16.8%; those aged 45-54, 14.4%; 55-64, 14.7%; 65-74, 16.7%; 75+, 26.5%. The groups were found to differ by age, gender, and levels of education, employment and poverty. Those who were visually impaired were found to be older, disproportionately female, have lower levels of education, unemployment, and were living in poverty.

Table 2.1
The prevalence of visual impairment (continued)

Author, year	Location of study	Definition	Overall sample	Visually impaired (VI)	Independent variables	Results
La Grow et al., 2011	Rural, Northeast Thailand	Self-reported “Do you have difficulty with seeing to the degree that it interferes with your daily functioning?”: yes/no.	N= 190 Mean age: 71.3 Range: 60-107 F= 63.2%	N= 91 Mean age: 71.9 F= 63.7%	VI: yes/no Age Gender Economic	Overall prevalence: 47.8%. The groups were not found to differ by age, gender or economic status.
Bekibele and Gureje, 2008	Rural, Nigeria	Self-reported “Do you have difficulty with seeing?”: yes/no.	N= 2,054 Mean age: 71.2 Range: 65-80 ⁺ F= 53.4%	N= 1,142 Mean age: NR F= 58.3%	VI: yes/no Age Gender	Overall prevalence: 55.9%; those aged 65-69, 41.1%; 70-74, 42.3%; 75-79, 62.0%; 80 ⁺ , 70.1%. The groups were found to differ by age but not gender. Those who reported having difficulty seeing were found to be older.

NR: Not reported

you have difficulty with seeing to the degree that it interferes with your daily life?” (Iliffe et al., 2005; La Grow, Sudnongbua, et al., 2011).

As can be seen in table 2.1, two of the 13 studies reviewed here used 6/12 as the threshold acuity for identifying people as being visually impaired (Chia, Mitchell, Rochtchina, Foran, & Wang, 2003; Wong et al., 2008), six used 6/18 (Esteban et al., 2008; Evans et al., 2002; Michon et al., 2002; Nirmalan et al., 2002; Oye & Kuper, 2007; Song et al., 2010) and five relied on self-report (Bekibele & Gureje, 2008b; Horowitz et al., 2005; Jin & Wong, 2008; La Grow et al., 2009; La Grow, Sudnongbua, et al., 2011). The rate of visual impairment reported ranged from 7.5% to 8.8% for those studies using 6/12 as the acuity threshold, 8.3 % to 41.3 % for those using 6/18, and 6.9% to 55.9% for those which relied on self-report.

The median rates reported increased from 8.2% for 6/12, to 15.8% for 6/18, and 16.8% for self-report. The two highest rates reported (47.8% and 55.9%) were from studies conducted in Thailand (La Grow, Sudnongbua, et al., 2011) and Nigeria (Bekibele & Gureje, 2008b) respectively. Both defined visual impairment by self-report. The study conducted in Nigeria (Bekibele & Gureje, 2008b) asked, “Do you have difficulty in seeing”, while the one conducted in Thailand (La Grow, Sudnongbua, et al., 2011) made this question more restrictive by specifying that the difficulty with seeing had to interfere with the respondent’s daily life, and asked, “Do you have difficulty with seeing to the degree that it interferes with your daily life?”. The study using the former less restrictive definition reported a higher rate of visual impairment than that conducted with the latter more restrictive definition.

The higher rates of visual impairment found in these studies, therefore, may be in part due to the fact that (a) self report is the least restrictive measure of visual

impairment, (b) the studies were conducted in developing countries where treatment of visual disability may be limited, or (c) a combination of both these factors.

2.2.2 Age and visual impairment

Age is an important factor in the rate of visual impairment identified. Eleven of the 13 studies reported the age of participants in the total sample (Bekibele & Gureje, 2008b; Chia et al., 2003; Esteban et al., 2008; Evans et al., 2002; Horowitz et al., 2005; Jin & Wong, 2008; La Grow et al., 2009; Michon et al., 2002; Nirmalan et al., 2002; Song et al., 2010; Wong et al., 2008). Four studies reported the age of participants in the total sample and the sub-sample of those who were visually impaired (Chia et al., 2003; Evans et al., 2002; La Grow et al., 2009; La Grow, Sudnongbua, et al., 2011). In all cases, the median age reported for those who were visually impaired was greater than that reported for the total sample. The median age reported for the total sample was 70.4 years while the median age reported for those who were visually impaired was 74.4 years. Differences in age across the samples were found to be significant in 9 of 11 studies in which they were investigated (Bekibele & Gureje, 2008b; Chia et al., 2003; Esteban et al., 2008; Evans et al., 2002; Horowitz et al., 2005; Jin & Wong, 2008; Michon et al., 2002; Song et al., 2010; Wong et al., 2008).

Eight studies investigated the rate of visual impairment by age cohort as well (Bekibele & Gureje, 2008b; Esteban et al., 2008; Evans et al., 2002; Horowitz et al., 2005; Jin & Wong, 2008; Michon et al., 2002; Song et al., 2010; Wong et al., 2008). All found the same pattern with the prevalence of visual impairment increasing markedly across the ever increasing age cohorts. The median rate of visual impairment across all eight studies was found to increase from 23.4% for those aged

60 and older, to 26.5% for those aged 70 and older, 30.2% for those 80 and older and 36.9% for those aged 90 and older.

2.2.3 Gender and visual impairment

All 13 studies reviewed reported the proportion of males and females in the total sample. The percentage of the total sample reported to be female ranged from 50.1% to 63.2% with a median of 54.5%. Twelve of the 13 studies reported the proportion of males and females in the sub-sample of those who were visually impaired (Bekibele & Gureje, 2008b; Chia et al., 2003; Esteban et al., 2008; Evans et al., 2002; Horowitz et al., 2005; Jin & Wong, 2008; La Grow et al., 2009; La Grow, Sudnongbua, et al., 2011; Michon et al., 2002; Oye & Kuper, 2007; Song et al., 2010; Wong et al., 2008). Of these studies, the rate of females reported ranged from 52.3% to 71.6% with a median of 61.3%.

In these twelve studies, a comparison was made between the groups by gender. Seven found statistically significant differences on gender between those who were visually impaired and those who were not, with those who were visually impaired found to be disproportionately female (Evans et al., 2002; Horowitz et al., 2005; Michon et al., 2002; Nirmalan et al., 2002; Oye & Kuper, 2007; Song et al., 2010; Wong et al., 2008).

2.2.4 Visual impairment and education

Of the 13 studies reviewed here, four studies investigated the association between visual impairment and levels of education. They were conducted in China (Song et al., 2010), Hong Kong, China (Michon et al., 2002), Canada (Jin & Wong, 2008), and the U.S.A. (Horowitz et al., 2005). All four studies found that those who were visually impaired had lower levels of education than those who were not.

2.2.5 Visual impairment and socioeconomic status

Of the 13 studies reviewed here, four studies investigated the association between visual impairment and economic status (Horowitz et al., 2005; La Grow et al., 2009; La Grow, Sudnongbua, et al., 2011; Michon et al., 2002). Three of the four studies found significant differences, as those who were visually impaired were poorer than those who were not (Horowitz et al., 2005; La Grow et al., 2009; Michon et al., 2002). No differences on economic status were found in one study (La Grow, Sudnongbua, et al., 2011).

2.2.6 Visual impairment and the country of residence

Of the 13 studies reviewed here, eight were conducted in developed countries: Australia (Chia et al., 2003), Singapore (Wong et al., 2008), Spain (Esteban et al., 2008), Great Britain (Evans et al., 2002), Hong Kong, a region of China, which was treated as a developed country in this analysis (Michon et al., 2002), Canada (Jin & Wong, 2008), New Zealand (La Grow et al., 2009) and the U.S.A. (Horowitz et al., 2005). Five were conducted in developing countries: Cameroon (Oye & Kuper, 2007), China (Song et al., 2010), India (Nirmalan et al., 2002), Nigeria (Bekibele & Gureje, 2008b), and Thailand (La Grow, Sudnongbua, et al., 2011). The rate of visual impairment reported ranged from 6.9% to 41.3% for those studies conducted in developed countries and 10.5% to 55.9% for those studies conducted in developing countries.

The median rate for both measured and self-reported visual impairment for the developed countries was 8.6% while the median rate for the developing countries was 30.7%. The median rate for measured visual impairment reported in the developing countries was 20.1% while the rate for self-reported visual impairment reported in the developing countries was 51.9%. The higher rates found in the

developing countries may be due to the fact that (a) treatment of visual disability in developing countries may be limited, (b) finances limit access to eye care and prevention, or (c) a combination of both reasons (Dineen et al., 2007; Rozhan et al., 2009).

2.2.7 Summary for the prevalence of visual impairment

The literature reviewed here indicates that a number of factors, including the definition of visual impairment used, age, gender, the country of residence, education, and economic status impact on the prevalence of visual impairment among this population. Those who are visually impaired were found to be older, disproportionately female, to have lower levels of education, and to be worse off economically than those who are not. The rate of visual impairment was found to be highest among those living in developing countries using self-report as the criteria for visual impairment.

2.3 The impact of visual impairment on Quality of Life (QOL)

The literature reviewed here investigated the impact of visual impairment on QOL among older visually impaired people living in the community from both developed and developing countries. As can be seen in Table 2.2, all 16 selected studies compared those who were visually impaired to those who were not on at least one variable thought to contribute to QOL among this population. All studies were conducted with persons aged 60 years and older and published in English. It is revealed from this review that visual impairment has a substantial impact on QOL which is indicated by difficulty in performing activities of daily living or explained

by scores on measures of physical health, psychological well-being, social function, socioeconomic standing and formal measures of QOL.

2.3.1 The impact of visual impairment on activities of daily living

Twelve of the 16 studies reviewed here compared those who were visually impaired with those who were not on ability to perform daily activities (Bekibele & Gureje, 2008b; Brown & Barrett, 2011; Chia et al., 2003; Jin & Wong, 2008; La Grow, Alpass, Stephens, & Towers, 2011; Lamoureux et al., 2009; Polack et al., 2008; Steinman & Allen, 2011; Tran et al., 2011; Vu et al., 2005; C. W. Wang, Chan, Ho, & Xiong, 2008; Wu et al., 2009). All found statistically significant differences between the groups. Those who were visually impaired had greater levels of difficulty in performing activities of daily living, including dressing (Bekibele & Gureje, 2008b; Steinman & Allen, 2011), getting in and out of bed, doing housework, going to movies or events, attending social events (Steinman & Allen, 2011), doing leisure activities at home (Bekibele & Gureje, 2008b; Steinman & Allen, 2011), reading, including the telephone book and newspaper (Lamoureux et al., 2009; Vu et al., 2005), getting around the house or neighbourhood (i.e. mobility) (Bekibele & Gureje, 2008b; La Grow, Alpass, et al., 2011; Lamoureux et al., 2009), toileting, getting out of and transferring from chair and bed, climbing stairs, reaching out overhead for a load, stooping, hand gripping (opening door, tap), and undertaking general activities in the home (Bekibele & Gureje, 2008b) than those who were not.

Table 2.2
The impact of visual impairment on QOL

Author, year	Location of study	Definition	Sample non VI:VI	Instrument	Variables	Results
Jin and Wong, 2008	Canada	Self- reported	2,487:184	- Self report - Medical history	- difficulty seeing (Y/N) - difficulty with everyday activities - self-rated health	Those who reported having difficulty seeing were found to be 7 times more likely to have difficulty with everyday activities and 15 times more likely to have poorer health conditions than to those who did not.
Steinman and Allen, 2011	U.S.A.	Self- reported	4,916:1,634	- ADL - IADL	- difficulty seeing (Y/N) - managing money - doing chores around the house - preparing meals - getting in/out of bed - using fork, knife, or drinking from a cup - dressing themselves - going to movies - attending social events	Those who reported poor vision were found to have greater levels of difficulty in performing activities of daily living, including dressing, getting in and out of bed, doing housework, going to movies or events, attending social events and doing leisure activities at home, than those who did not.

Table 2.2
The impact of visual impairment on QOL (continued)

Author, year	Location of study	Definition	Sample	Instrument	Variables	Results
Brown and Barrett, 2011	U.S.A.	Self- reported	910:311 non VI:VI	- ADL - IADL	- performing leisure activities at home - difficulty seeing (Y/N) - activity limitations - income - financial strain - social integration - social perceived support - self-efficacy	Those who were visually impaired were found to have lower scores on activity limitations, income, financial strain, social integration, depression and self-efficiency than those who were not.
Wu et al., 2009	U.S.A.	<6/12	690:263	NEI-VFQ-25	- VI: (Y/N) - general health - general vision - ocular pain - near activities - distance activities - social functioning - mental health	Those who were visually impaired were found to have lower scores on all domains (i.e. general health, general vision, ocular pain, near activities, distance activities, social functioning, mental health, role difficulties, dependency, driving, colour vision, and peripheral vision) than those with correctable or non-impaired vision.

Table 2.2
The impact of visual impairment on QOL (continued)

Author, year	Location of study	Definition	Sample	Instrument	Variables	Results
Zimdars et al., 2012	Great Britain	Self- reported	9,569:1,823 non VI:VI	- ADL - IADL - CES-D	- role difficulties - dependency - driving - colour vision - peripheral vision - How is your eyesight (excellent, very good, fair, poor, blind) - physical and cognitive functions - economic well-being - social relationships and social engagement - emotional well-being	Those who reported poor vision were found to be 7 times more likely to report poorer health and 2 times more likely to be affected by negative economic circumstances compared to those who reported fair or good vision.
Vu et al., 2005	Australia	<6/12	2069:302: 159	SF-36	- VI: (no/unilateral/bilateral) - physical functioning - falls	Those who were visually impaired were found to have poorer health and more emotional problems than those with

Table 2.2
The impact of visual impairment on QOL (continued)

Author, year	Location of study	Definition	Sample	Instrument	Variables	Results
Chia et al., 2004	Australia	<6/12	3,088:66 non VI:VI	SF-36	<ul style="list-style-type: none"> - getting help with chores - dependency - health/emotional problems - feeling full of life - reading telephone book - reading newspaper - watching TV - seeing faces - doing other activities - VI: (Y/N) - physical functioning - role limitations due to physical problems - bodily pain - general health perceptions - vitality - social functioning 	<p>normal vision.</p> <p>Those with non-correctable unilateral vision loss were found to be 2 to 5 times more likely to have problems in reading the telephone book, newspaper, watching television and seeing faces, while those with non-correctable bilateral vision loss were found to be 6 to 41 times more likely to report problems with these activities.</p> <p>Those who were visually impaired (bilateral visual impairment) were found to have lower scores on physical functioning, general health, vitality, social functioning, and mental health scores than those who were not.</p>

Table 2.2
The impact of visual impairment on QOL (continued)

Author, year	Location of study	Definition	Sample	Instrument	Variables	Results
Chia et al., 2003	Australia	<6/12	2,916:237 non VI:VI	SF-36	<ul style="list-style-type: none"> - role limitations due to emotional problems - mental health - VI: (Y/N) - physical functioning - role limitations due to physical problems - bodily pain - general health perceptions - vitality - social functioning - role limitations due to emotional problems - mental health 	<p>Those who were visually impaired (unilateral visual impairment) were found to have lower scores in role limitations due to physical problems, in social functioning, in role limitations due to emotional problems, and a mental health component, than those who were not.</p>
Lamoureux et al., 2009	Australia	<6/12	40:35	NHVQOL	<ul style="list-style-type: none"> - VI: (Y/N) - general vision - reading 	<p>Those who were visually impaired (both distance and near vision loss) were found to have lower scores on general vision,</p>

Table 2.2
The impact of visual impairment on QOL (continued)

Author, year	Location of study	Definition	Sample	Instrument	Variables	Results
La Grow et al., 2011	New Zealand	Self report	1,987:265 non VI:VI	- ELSI - PQOL - SF-36 - SPS	- ocular symptoms - mobility - psychological distress - activities of daily living - activities and hobbies - adaptation and coping - social interaction - difficulty seeing (Y/N) - satisfaction with ADL - ability to get around - economic status - physical health status - mental health status - social provisions - social isolation - satisfaction with life - perceived quality of life	reading, daily living activities, mobility, hobbies, and psychological and social interaction, than those who were not. Those who reported having difficulty seeing were found to have lower scores on satisfaction with ADL, ability to get around, economic status, physical and mental health status,, social isolation, satisfaction with life, and perceived quality of life, than those who did not.

Table 2.2
The impact of visual impairment on QOL (continued)

Author, year	Location of study	Definition	Sample	Instrument	Variables	Results
La Grow et al., 2011	Rural Thailand	Self- reported	99:91 non VI:VI	- WHOQOL-BREF - WHOQOL-OLD	- difficulty seeing (Y/N) - physical - psychological - social - environment - sensory abilities - autonomy - past present and future - social participation - death and dying - intimacy	The mean scores were 46.94 for physical health, 58.19 for psychological, 64.46 for social relationships, and 58.31 for environment domains of the WHOQOL- BREF and 41.28 for sensory abilities, 62.63 for autonomy, 68.13 for past, present and future, 64.77 for social participation, 48.07 for death and dying, and 64.08 for intimacy facets of the WHOQOL-OLD. Those who reported having difficulty seeing were found to have lower scores in physical and psychological health domains of the WHOQOL-BREF and the sensory abilities facet of the WHOQOL-OLD than those who did not.

Table 2.2
The impact of visual impairment on QOL (continued)

Author, year	Location of study	Definition	Sample	Instrument	Variables	Results
Bekibele and Gureje, 2008	Nigeria	Self-reported	912:453: 377:312 non VI:VI	- Self-rated health - ADL - IADL	- difficulty seeing (no/ distance/near/both distance and near) - difficulty bathing - dressing - toileting - getting out of and transferring from chair, and bed - continence - feeding - walking - climbing stairs - reaching out overhead for a load - stooping - hand grip (opening door, tap) - general home activities	The mean scores were 69.78 for the physical health, 74.04 for psychological, 65.32 for social relationships, and 68.06 for environment domains of the WHOQOL-BREF. Those who reported having difficulty seeing were found to be more likely to report poorer health than those who reported normal vision. Those who reported near visual impairment were found to have lower scores on dressing, toileting, getting out of and transferring from chair and bed, walking, climbing stairs, reaching out overhead for a load, stooping, hand gripping (opening door, tap), and undertaking general activities in the home, than those who reported normal vision.

Table 2.2
The impact of visual impairment on QOL (continued)

Author, year	Location of study	Definition	Sample non VI:VI	Instrument	Variables	Results
Bekibele and Gureje, 2008	Nigeria	Self- reported	912:453: 377:312	WHOQOL-BREF	- difficulty seeing (no/ distance/near/both distance and near) - physical - psychological - social	Those who reported having distance visual impairment were found to have lower scores in the environment domain than those who reported normal vision. Those who reported having near visual impairment were found to have lower scores in the physical, psychological social relationship, and environment domains
Tran et al., 2011	Nigeria	<6/12	1,803:273	VF/QOL	- VI: (Y/N) - self-care - mobility - social - mental well-being - friendship network - interdependent relationships - social functions	Those who were visually impaired were found to have lower scores on total QOL and all QOL subscales than those who were not.

Table 2.2
The impact of visual impairment on QOL (continued)

Author, year	Location of study	Definition	Sample non VI:VI	Instrument	Variables	Results
Nutheti et al., 2006	India	<6/18	2,357:1345	HRQOL	- mental health - role limitations/ dependence - ocular pain - VI: (Y/N) - total score of QOL	Those who were visually impaired were found to lower scores on total QOL than those who were not.
Polack et al., 2008	Rural Bangladesh	<6/18	280:217	- WHO/ PBD- VF20 - EQ-5D	- VI: (Y/N) - visual symptoms - general functioning - psychological - self-rated health	Those who were visually impaired were found to have lower scores in general functioning including mobility, self-care, and usual activities, psychological problems related to anxiety and have poorer self-rated health than those who were not.

2.3.2 The impact of visual impairment and physical health

Ten of the 16 studies compared those who were visually impaired with those who were not on health status (Bekibele & Gureje, 2008a, 2008b; Chia et al., 2004; Jin & Wong, 2008; La Grow, Alpass, et al., 2011; La Grow, Sudnongbua, et al., 2011; Lamoureux et al., 2009; Vu et al., 2005; C. W. Wang et al., 2008; Zimdars et al., 2012). All reported statistically significant differences between the groups, finding those who were visually impaired to be in poorer health than those who were not. Those who were visually impaired, for example, were found to be 7 to 15 times more likely to report poorer health conditions than those who were not (Jin & Wong, 2008; Zimdars et al., 2012). In addition, poor vision was also strongly associated with having multiple difficulties, hearing impairment, and problems related to performing activities of daily living (Zimdars et al., 2012).

2.3.3 The impact of visual impairment on psychological well-being

Ten of the 16 studies compared those who were visually impaired with those who were not on psychological well-being (Bekibele & Gureje, 2008a, 2008b; Brown & Barrett, 2011; Chia et al., 2003; Chia et al., 2004; La Grow, Sudnongbua, et al., 2011; Lamoureux et al., 2009; Polack et al., 2008; Vu et al., 2005; Wu et al., 2009). All found statistically significant differences between the groups, with those who were visually impaired found to be in poorer psychological health than those who were not. They were also found to be two times more likely to be depressed than those who were not (Brown & Barrett, 2011; Noran, Izzuna, Bulgiba, Mimiwati, & Ayu, 2009), to have more role limitations due to emotional problems (Chia et al., 2003) and to have more psychological problems related to anxiety (Polack et al., 2008).

2.3.4 The impact of visual impairment on social function

Ten of the 16 studies compared those who were visually impaired with those who were not on social function (Bekibele & Gureje, 2008a; Brown & Barrett, 2011; Chia et al., 2003; Chia et al., 2004; La Grow, Alpass, et al., 2011; Lamoureux et al., 2009; Steinman & Allen, 2011; Tran et al., 2011; C. W. Wang et al., 2008; Wu et al., 2009). All found statistically significant differences between the groups, with those who were visually impaired found to have higher levels of difficulty with social functioning including social interaction (Brown & Barrett, 2011; Lamoureux et al., 2009), and attending social events (Steinman & Allen, 2011), than those who were not. In addition, visually impaired people were found to have fewer friends (C. W. Wang et al., 2008) and more likely to be socially isolated (La Grow, Alpass, et al., 2011) than those who had good vision.

2.3.5 The impact of visual impairment on socioeconomic status

Three of the 16 studies compared those who were visually impaired with those who were not on socioeconomic status (Brown & Barrett, 2011; La Grow, Alpass, et al., 2011; Zimdars et al., 2012). All reported that those who were visually impaired were found to be worse off economically than those who were not. In addition, they were found to be two times more likely to be affected by negative economic circumstances compared to those with good vision (Zimdars et al., 2012).

2.3.6 The impact of visual impairment on QOL measures

Seven of 16 studies compared those who were visually impaired with those who were not on standard measures of QOL (Bekibele & Gureje, 2008a; La Grow, Alpass, et al., 2011; La Grow, Sudnongbua, et al., 2011; Lamoureux et al., 2009; Nutheti et al., 2006; Tran et al., 2011; C. W. Wang et al., 2008). Statistically significant differences were found between the groups, with those who were visually

impaired found to have lower scores on the total score of the health-related quality of life (HRQOL) (Nutheti et al., 2006), the total score of the visual function and quality of life (VFQOL), as well as the self-care, mobility, social and mental well-being subscales of the VFQOL (Tran et al., 2011), the psychological and social interaction subscales of the nursing home vision-targeted health-related quality of life (NHVQOL) (Lamoureux et al., 2009), the social function subscale of the national eye institute 25-item visual function questionnaire (NEI-VFQ-25) (C. W. Wang et al., 2008), overall perception of QOL of the WHOQOL-BREF (La Grow, Alpass, et al., 2011), all four domains of the WHOQOL-BREF (i.e. physical health, psychological, social relationships and environment) (Bekibele & Gureje, 2008a), the physical health and psychological domains of the WHOQOL-BREF and the sensory abilities facet of the WHOQOL-OLD (La Grow, Sudnongbua, et al., 2011).

Two of 16 studies reported scores from the four domains of the WHOQOL-BREF and the six facets of the WHOQOL-OLD for those who were visually impaired. A study conducted in Thailand reported a norm of 46.94 for physical health, 58.19 for psychological, 64.46 for social relationships, and 58.31 for the environment domains of the WHOQOL-BREF and 41.28 for the sensory abilities, 62.63 for autonomy, 68.13 for past, present and future, 64.77 for social participation, 48.07 for death and dying, and 64.08 for the intimacy facets of WHOQOL-OLD (La Grow, Sudnongbua, et al., 2011). The study conducted in Nigeria reported 69.78 for the physical health, 74.04 for psychological, 65.32 for social relationships, and 68.06 for the environment domains of the WHOQOL-BREF (Bekibele & Gureje, 2008a).

Only the scores on the past, present and future (68.13 vs. 64.29) and intimacy (64.08 vs. 62.15) facets of the WHOQOL-OLD reported in a study conducted in Thailand were found to be higher than the scores reported for 20 countries around the

world (WHO, 2006). While the score on psychological domain (74.04 vs. 69.58) reported in a study conducted in Nigeria was found to be higher than that reported for older persons in Australia (Hawthorne et al., 2006).

2.3.7 Summary for the impact of visual impairment on QOL

The literature reviewed here indicates that visual impairment has a substantial impact on QOL which is indicated by difficulty in performing activities of daily living or explained by scores on measures of physical health, psychological well-being, social function, socioeconomic standing and formal measures of QOL. Those who are visually impaired were found to have difficulty performing activities of daily living and to have lower scores on physical health, psychological well-being, social participation, economic well-being, and measured QOL than those who were not in every case reviewed.

2.4 Older persons in rural communities of Northeast Thailand

In more developed countries, older persons usually live independently with their spouse or alone after their spouse has died (Chappell, 2003). They generally take care of themselves and rely for support on a pension from their government (Tang, 2007). Following the onset of visual impairment and subsequent losses in functional ability for performing activities of daily living, including mobility, they often experience a loss of independence, self confidence, despair, anxiety, depression, and social isolation (Brown & Barrett, 2011; La Grow et al., 2009; Noran et al., 2009).

In Thailand, especially in the rural Northeast, older persons traditionally live with their children in a large household, with many generations living in the same house, or many houses, within the same area. Although a rapid socioeconomic

development in the country has resulted in the migration of adult children from rural to urban areas due to labour needs, it has been found that only 9% of older persons in this region live alone while the vast majority (91%) still live with their children in extended family groups (Sudnongbua et al., 2010).

In the local community, older persons also have a stable social network of friends or neighbours that have lived for a long time in the same community. They maintain frequent contact and interaction with other village members by visiting or chatting (Jitapunkul, Chayovan, & Kespichayawattana, 2001; Jongudomkarn & Camfield, 2006). Furthermore, Buddhism influences their lives and also their traditional cultures (Knodel & Chayovan, 2008) as most of the people in Thailand (95%) adhere to Buddhism (Ministry of Public Health of Thailand, 2010). The dominant concept adopted from Buddha's teachings is to understand and accept the nature of all existence, as every situation, good or bad, is recognised in the Buddhist view as a product of Karma for each individual (Sucitto, 2010). Karma is a natural law that operates in accordance with people's actions and it is the law of cause and effect. It can be simply explained: do good and good will come to you, do bad and bad will come to you (Sucitto, 2010). Therefore, believing in Karma makes Thais accepting of barriers they face in life.

Another main concept of Buddha's teaching is to be patient (Sucitto, 2010). Patience makes people control their anger and aggression, motivating faith in their ability to accept things as they are (Sucitto, 2010), especially, when facing a hard situation or one that is difficult to change (Lundber & Thrakul, 2011). Believing in Buddha's teaching also contributes to better psychological well-being, satisfaction with life and less depression, as people can accept and understand what is happening in their lives (Othaganont, Sinthuvorakan, & Jensupakarn, 2002).

In the family, there is a hierarchy with the parents or older persons at the top. Respect for elders in the family is instilled very early and even applies to older persons outside the family as well (Choowattanapakorn, 1999). Furthermore, filial piety remains an important value in Thailand for regulating the behaviour of children towards their elderly parents (Jongudomkarn & Camfield, 2006). This norm is encouraged through tax reductions for those who take care of or support their parents (Jitapunkul et al., 2001; Jongudomkarn & Camfield, 2006; United Nations, 2007). This is also similar to other Asian countries such as the Philippines, Taiwan, China, Vietnam, and Cambodia (Agree, Biddlecom, Chang, & Perez, 2002; Jongudomkarn & Camfield, 2006; Knodel & Chayovan, 2008, 2009; Knodel & Saengtienchai, 2007a; Zimmer & Kwong, 2003), where children are expected to support their parents and older persons in return for the nurture they received as children (Choowattanapakorn, 1999). These expectations of care for older parents include instrumental tasks such as cooking, shopping, or doing house work, as well as financial, emotional, and social support.

2.4.1 Instrumental support

Children are expected to take the full responsibility for the care of the older members through assistance with instrumental support as related to the activities of daily living such as bathing, dressing, doing laundry, shopping, providing transport, preparing meals or doing housework, especially when it becomes too difficult for the elderly parents to take care of themselves. The support can be provided from children who live in the same house and children who live near the parents (Glaser et al., 2006). However, for some children who do not live in the same house due to work in other areas, or who cannot take responsibility for their parents' care, financial support may be another appropriate way to show their gratitude to their parents.

2.4.2 Financial support

The children are also expected to assist with financial support. This includes paying for everyday expenses and medical fees. It is common for parents to receive financial support from their children, as older persons in Thailand receive little or no pension income from the government (Knodel & Saengtienchai, 2007a). While all children are expected to provide financial help to parents, this is especially true for those who migrate to work in the big cities or have a good income. This support is required in order to maintain older parents' physical health and it is the main source of income of older parents, as they no longer work for pay and can suffer from health conditions (Agree et al., 2002). However, those children who have economic problems and are not be able to provide financial support for their parents may need to provide emotional and social support instead.

2.4.3 Emotional and social support

As older persons in Thailand live with their families or live very close to at least one child, they see their children or other relatives often. Generally, people in the extended family are more likely to spend and share time together. For example, they gather together at night time to watch television or undertake leisure activities (Knodel & Chayovan, 2008, 2009; Knodel & Saengtienchai, 2007a). For those who are not co-resident or live far from older parents, they may contribute to this support by making a phone call or through regular visiting.

Since the structure of family, living arrangements and religious beliefs between the Western world and rural Thailand are different, it is difficult to draw conclusions about the impact of visual impairment on QOL among older persons living in rural Northeast Thailand. However, it is expected that it will not be as great or as comprehensive as in the literature due to differences between the aspects of

family life and life style among older persons in Thailand and in the more developed countries. Thai families normally live together and support each other. Older persons are generally surrounded by their children and grandchildren. In addition, older persons are usually cared for by their children, especially their activities of daily living including assisting them out of bed, showering, dressing, cleaning, meal preparation, and shopping (Jongudomkarn & Camfield, 2006; Knodel & Chayovan, 2008; Lundber & Thrakul, 2011). Therefore, older Thais may not experience difficulty in performing their daily activities, and social isolation as often found among older persons in the more developed countries.

2.5 Implications for the current study

As this study is to be conducted in the Northeast region of Thailand, the poorest and the most rural area of a developing country, the literature indicates that the rate of self-reported visual impairment to be found here should be even higher than the median of 30.7% reported for developing countries. It is also expected that the rate of assessed visual impairment to be found here will be higher than the 22.1% reported for the developing countries as this study was specifically conducted in a poor and rural area of a developing country. Furthermore, it is expected that the rate of assessed visual impairment to be found here will exceed the 22.0% reported in the official statistics for the country (National Statistical Office of Thailand, 2002) as the official rate is estimated for the country as a whole and not for the Northeast region specifically, which is the poorest and most rural region of the country.

While it is expected that the rate for self-reported visual impairment to be found here will be similar to that found by La Grow, Sudnongbua, et al., (2011) for this region (47.8%); it needs to be verified because the sample for that study selected

to assess the impact of feelings of abandonment among older persons in rural Northeast Thailand rather than for the purpose of assessing the rate of visual impairment (La Grow, Sudnongbua, et al., 2011). In addition, sampling selection was restricted to those who had had children only and limited to one participant per household only (Sudnongbua et al., 2010). It is also expected that those who are visually impaired will be found to be older, disproportionately female, have lower levels of education, and to be worse off economically and be in worse health than those who are not, as is suggested in the literature review.

It is also expected, as observed in the studies reviewed here, that visual impairment will be found to have a negative impact on QOL measures. However, the impact of visual impairment on QOL found in this study may differ from that found in other cultures as Thai adults, especially those who live in rural areas, are more likely to live communally, and therefore, less likely to become socially isolated or experience depressed states than those in developed countries, and independence may not be valued to the degree that it is among those who live in developed countries (Brown & Barrett, 2011; Knodel & Chayovan, 2009; La Grow et al., 2009; Vu et al., 2005; Wu et al., 2009).

The earlier study conducted in this area (La Grow, Sudnongbua, et al., 2011) found that those who reported having difficulty seeing had lower scores on the physical health and psychological domains of the WHOQOL-BREF and the sensory abilities facet of the WHOQOL-OLD than those who did not. However, these findings indicated that the impact of visual impairment on QOL was not as comprehensive as this review suggests [i.e. the impact on performing activities of daily living (Brown & Barrett, 2011; La Grow, Alpass, et al., 2011), physical health (La Grow, Alpass, et al., 2011; La Grow, Sudnongbua, et al., 2011; Zimdars et al.,

2012), psychological well-being (Brown & Barrett, 2011; La Grow, Sudnongbua, et al., 2011; Lamoureux et al., 2009), social function (Brown & Barrett, 2011; La Grow, Alpass, et al., 2011; Steinman & Allen, 2011; Tran et al., 2011), socioeconomic standing (Brown & Barrett, 2011; La Grow, Alpass, et al., 2011; Zimdars et al., 2012) and formal measures of QOL (Bekibele & Gureje, 2008a; La Grow, Alpass, et al., 2011; Tran et al., 2011)]. This finding, reported by La Grow, Sudnongbua, et al., (2011) needs to be verified, however, for the reasons stated above.

It is expected that the impact of visual impairment on QOL found in this study may be different from that earlier study (i.e. La Grow, Sudnongbua, et al., 2011), as it is conducted with a sample selected for this specific purpose, even if conducted with a similar sample in the same region of the country.

The first part of this study seeks to determine the rate of visual impairment among older persons living in a rural area of Northeast Thailand using both clinical and self-reported measures of visual impairment. Self-reported visual disability will be defined using the same question as that was used in the previous study (i.e. “Do you have difficulty with seeing to degree that it interferes with your daily life?”) (La Grow, Sudnongbua, et al., 2011). Measured visual impairment will be defined using the criteria of visual impairment adhered to by the Thai Government (i.e. 6/18 or worse in the better eye when wearing normal correction or a field of vision that does not exceed 30 degrees at the widest angle) (National Statistical Office of Thailand, 2002), allowing for direct comparison to the estimates of visual impairment made for this country (National Statistical Office of Thailand, 2002). Rates of visual impairment will also be reported for those 60⁺, 65⁺, 75⁺, and 85⁺ for comparison with earlier studies. Comparison between the groups on age, gender, levels of education,

economic status, and overall perception of health will be made to test if they differ on these variables.

The second part of this study is designed to replicate the earlier study (La Grow, Sudnongbua, et al., 2011) and aims to determine the impact of visual impairment on QOL among older persons living in a rural area of Northeast Thailand with a sample specifically selected for this purpose. The impact of visual impairment will be measured using the WHOQOL-BREF and the WHOQOL-OLD as done in the earlier study (La Grow, Sudnongbua, et al., 2011).

Finally, the model proposed in Chapter One to explain the relationship between visual impairment, QOL and other factors will be assessed to determine its applicability across the entire sample of participants with visual impairment being one of the factors to be considered.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This study aimed to estimate the prevalence of both self-reported and assessed visual impairment among older persons living in a rural area of Northeast Thailand, to examine the impact of visual impairment on their quality of life, and to assess the factors which affect QOL among older persons living in Northeast Thailand. This chapter presents details of the study design, methodology used including study population, sample size, and sampling selection of participants; procedures and data collection instruments, data collection steps, data management and analysis, as well as ethical considerations.

3.2 Study design

The research design used in this study, a population-based survey, is the most appropriate analytic approach to studying a sample of individuals selected from a larger population. Participants of population-based survey studies are drawn from a probability sample. Participants are randomly selected with each member of the population of interest having an equal chance of selection. Descriptive information from this study may be of use in understanding the extent of the problem as distributed in the population of interest (Cwikel, 2006). In addition, a population-based survey is often used in health science research to obtain information that is needed for planning health services and implementation of health programmes (Levy & Lemeshow, 2008). The findings of this study will accurately identify the size and

extent of the problems associated with visual impairment and provide essential information for the improvement of eye care services in the country, especially in the rural areas sampled.

3.3 Methodology

The study was conducted in Maha Sarakham province between September 2009 and January 2010. The participants were selected from the Health Centre Information System (HCIS) database (Ministry of Public Health of Thailand, 2008). Selection was restricted to those who were aged 60 years and older and living in rural areas of the province.

3.3.1 Sample size

According to the National Statistical Office of Thailand (2001), the population of Maha Sarakham province was 947,300 with 8.5 % aged 60 and older at the time of this study. There are 13 districts in total: 4 large districts with a population of 100,000 or more, and 9 smaller districts with a population of 100,000 or less. There were approximately 150,000 people living in municipal areas and 800,000 in non-municipal areas (rural areas). For this study, it was assumed that the population in the rural areas of Maha Sarakham was 800,000 with 68,000 (8.5%) aged 60 years and older.

A minimum sample size of 398 was found to be sufficient to give prevalence estimates (i.e. a precision of 0.05 and a confidence level of 95%). The formula used to determine sample size is shown below (Yamane, 1973).

Formula:

$$n = \frac{N}{1+N(e^2)}$$

$$n = \frac{68,000}{1+68,000(0.05)^2}$$

$$n = \frac{68,000}{171}$$

$$n = 398$$

Description:

n = Sample size.

N = Population of elderly people in rural area (8.5% of 800,000 = 68,000).

e = The level of precision (margin of error at 5%, $e = 0.05$).

To reduce the potential for bias from non-response and non-coverage, oversampling was applied to ensure that the minimum sample size was achieved (Cochran, 1977). It was also anticipated that a response rate of 80% would be achieved. As a result, a total of 500 people were selected and invited to participate in this study.

3.3.2 Sample selection

Participants were selected using a multistage stratified area probability sampling of individuals. The sampling stage consists of three levels of selection based on local government areas: districts as first units, sub-districts as secondary sampling units, and then individuals as the final sampling units. Firstly, one of the four large districts and two of the nine small districts were randomly selected, totalling three districts (i.e. one large and two smaller districts). Secondly, a sub-district from each district was randomly selected resulting in three sub districts. The

population of these three sub districts were identified from the local primary health care units (i.e. HCIS) and restricted to those who were aged 60 years and older. Finally, the 500 participants in this study were randomly selected from this pool.

3.3.3 Criteria for inclusion

Older people aged 60 years and older and only those registered with the HCIS database living in rural areas of Maha Sarakham province were eligible for participation in this study. The cut-off age of 60 was selected as Thailand uses this as the demarcation for older adults for the census of demographic and health information in the country (Ministry of Public Health of Thailand, 2008). It is also commonly considered to be the age at which people usually retire and become eligible for retirement benefits (Ministry of Public Health of Thailand, 2008). Participants were also selected on the basis of where they lived, as this study was interested in determining the prevalence of visual impairment and its impact on the QOL of older persons living in rural areas of Northeast, Thailand.

3.3.4 Procedure

This study was conducted using a self-administered questionnaire. However, for those participants who were illiterate and those who could not see well enough, the questionnaire was read to them by the researcher. An information sheet was also read out to the illiterate participants and those who could not see well enough. For those who were literate, the information sheet was handed out to all participants before the questionnaire was administered. This contained information about the nature of the study and a description of each of the study procedures. The participants were also informed that they had the right to refuse to participate, as well as the right to decline to answer any question and withdraw from the study at any time. Written consents were obtained from those participants who were literate and

could read and sign the form. For those who were illiterate and those who could not see well enough, consent was read to them and oral consent accepted.

All participants were asked to fill out the questionnaire which collected demographic details and included a question asking the participants to indicate difficulty with seeing; “Do you have difficulty with seeing to the degree that it interferes with your daily life?” Those who answered “yes” to this question had their visual acuity assessed. Those who were not found to meet the criteria of visual impairment by assessed visual acuity had their visual field assessed using a field confrontation test (Wilkinson, 1996).

3.3.5 Data collection instruments

According to guidelines for producing materials in large print for those who are older and experiencing disabilities, especially vision impairment (Keeffe, Jin, et al., 2002), the survey questionnaire, consent forms, information sheets, and summaries were provided in 16-point Times New Roman typeface. The questionnaire was printed in bold black on contrasting white paper.

The questionnaire for this study consisted of 62 items (see appendix C). One item specifically asked the participants to indicate if they had difficulty with seeing to the degree that it interfered with their performance of daily activities. Four items were focused on demographic details including age, gender, marital status, and level of education. Three items focused on economic issues (i.e. employment, monthly income and economic hardship). Two items asked about health conditions and two items focused on visual tests (i.e. visual acuity and visual field test).

In addition, two standard measures of the quality of life were used to assess QOL: the Thai version of the World Health Organization Quality of Life-BREF (WHOQOL-BREF) and a translated version of the World Health Organization

Quality of Life-OLD (WHOQOL-OLD). Both the WHOQOL-BREF and WHOQOL-OLD were rated on a 5-point scale ranging from “Not at all” (a score of 1) through to “Completely” (a score of 5). Higher scores indicate a better quality of life. In this study, the two single-item measures of overall perception of health and overall perception of QOL from the WHOQOL-BREF and the total scores of the WHOQOL-BREF and the WHOQOL-OLD were analysed separately following recommended guidelines (WHO, 1996, 2006).

3.3.5.1 The World Health Organization Quality of Life-BREF (WHOQOL-BREF)

The WHO initially developed a generic cross cultural instrument, called WHOQOL-100, to measure QOL for 15 countries including Thailand (The WHOQOL Group, 1998). QOL was defined as “individuals’ perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns” (WHO, 1996, p. 5). This is a broad-ranging concept affected in a complex way by the person’s physical health, psychological state, level of independence, social relationships, and their relationship to salient features of their environment. This instrument, therefore, consisted of 100 items in six domains, including physical health, psychological well-being, level of independence, social relationships, environment, spirituality and religion, and personal beliefs. The six domains had been divided into 24 facets; however, the WHOQOL-100 was considered to be too lengthy for practical use (The WHOQOL Group, 1996). After analysis of the six domains of the WHOQOL-100 (i.e. physical, psychological, independence, social relations, environment and spirituality), the WHOQOL-Group decided to merge the physical and independence, as well as psychological and spirituality domains, thereby creating four domains in the WHOQOL-BREF.

As can be seen in table 3.1, the WHOQOL-BREF comprises the four domains (i.e. physical health, psychological, social relationships, and environment) and two additional items which assess overall perception of QOL and overall perception of health (WHO, 1996). The scores of these 4 domains are combined to produce a total score of QOL. Domain scores and individual overall perception of health and overall perception of QOL are also reported.

Table 3.1

The WHOQOL-BREF domains

Domain	Facets incorporated within domains
Physical health	Activities of daily living Dependence on medicinal substances and medical aids Energy and fatigue Mobility Pain and discomfort Sleep and rest Work and capacity
Psychological	Bodily image and appearance Negative feeling Positive feeling Self-esteem Spirituality/ religion/ personal beliefs Thinking, learning, memory and concentration
Social relationships	Personal relationships Social support Sexual activity

Table 3.1 (Continued)*The WHOQOL – BREF domains*

Domain	Facets incorporated within domains
Environment	Financial resources Freedom, physical safety and security Health and social care: Accessibility and quality Home environment Opportunities for acquiring new information and skills Participation in and opportunities for recreation/ leisure activities Physical environment (pollution/ noise/ traffic/ climate) Transport

Source: WHOQOL-BREF: Introduction, administration, Scoring and generic version of the assessment, The WHOQOL Group, 1996.

3.3.5.2 The World Health Organization Quality of Life-OLD (WHOQOL-OLD)

A translated version of the WHOQOL-OLD was used in addition to the WHOQOL-BREF as this is recommended for measuring the QOL of older people (Power et al., 2005). As can be seen in table 3.2, the WHOQOL-OLD supplements the WHOQOL-BREF with additional factors particularly relevant to older adults which includes six facets; sensory abilities, autonomy, past, present and future activities, social participation, death and dying, and intimacy (Power et al., 2005). The scores of these six facets are combined to produce a total score of QOL in older adults. Facet scores are also reported separately.

The Thai version of the WHOQOL-OLD was adopted from Sudnongbua (2011). In that study, the English version of the WHOQOL-OLD was translated into Thai by Sudnongbua (2011). It was then back translated into English by three native Thais fluent in English who had not seen the English version. The original and back

translated documents were compared and verified for language incongruities (Sudnongbua, 2011). A pilot study was conducted to assess the reliability of this instrument. It was found to have very good internal consistency with a Cronbach's alpha coefficient of 0.84 (Sudnongbua, 2011).

Table 3.2

The concepts and contents of the facets included in the WHOQOL-OLD module

Facet	Concepts and contents
Sensory abilities	Sensory functioning, impact of loss of sensory abilities on quality of life
Autonomy	Independence in old age; being able or free to live autonomously and to take own decisions
Past, Present and Future activities	Satisfaction about achievements in life and at things to look forward to
Social participation	Participation in activities of daily living, especially in the community
Death and dying	Concerns, worries and fears about death and dying
Intimacy	Being able to have personal and intimate relationships

Source: WHOQOL – OLD: Manual, WHO, 2006.

3.3.5.3 A screening question for self-reported visual impairment

A question used to assess self-reported visual impairment was asked of the participants to indicate difficulty with seeing: “Do you have difficulty with seeing to the degree that it interferes with your daily life?” The options for responding were: no difficulty and difficulty. Those who identified difficulty were classified as having difficulty with seeing and were assessed for visual acuity.

3.3.5.4 Visual acuity test

Visual acuity was measured using a portable test which displayed the illiterate E Snellen eye chart on a 17" computer screen from 3 metres. Measures were taken in a person's home or in the community health centre. Visual acuity was assessed for each eye separately while wearing normal correction (i.e. eye glasses or contact lenses). The E Snellen chart consists of lines of the letter E oriented in different directions, beginning with the largest letter on the screen. The sizes of the letters gradually decrease. In the test, the participant covered one eye and indicated the direction of orientation of the letter on the computer screen, beginning with the largest and moving toward the smallest. The smallest letter that the participant reads accurately determines his or her visual acuity in the uncovered eye. The test was repeated with the other eye. The best acuity measure obtained for either eye was used to determine eligibility for inclusion (Dickinson, 1998; Wilkinson, 1996). All those with an acuity of 6/18 or worse in the better eye were considered to have met the criterion for visual impairment set by the Thai Government (National Statistical Office of Thailand, 2002; Royal Thai Government, 1994). Those who did not meet the criteria of visual impairment by visual acuity measured were assessed for visual field using a field confrontation test.

3.3.5.5 Visual field test

A confrontation visual field test was conducted to measure visual field. Those who did not meet the criteria of visual impairment by assessed visual acuity were assessed for visual field using a field confrontation test. The confrontation visual field test was used to determine if their visual field was equal to or greater than 30 degrees at its widest angle (National Statistical Office of Thailand, 2002). In this test, the participant sits facing the examiner at approximately 0.6 metres away looking

straight ahead. When the examiner wiggled an index finger in each of the four quadrants of the visual field, the participant indicated whether or not he or she could see it. This technique is used to assess the central 30 degrees of field (Dickinson, 1998; Wilkinson, 1996). However, none of those assessed for restricted visual field (i.e. 30 degrees) were found to meet this criterion for visual impairment.

3.3.6 Steps for data collection

First of all, the principal researcher visited Maha Sarakham Health Office to inform the director of the nature of the study and data collection steps; a copy of the database of the HCIS was requested. The health officers of the three selected sub-districts were also contacted and visited to inform the health workers, including health officers and health volunteers, about the study. Once the sample was selected, participants were visited in their homes for data collection. Before finishing each interview, the researcher checked whether the questionnaire was completed.

3.4 Data management and data analysis

The data obtained from the survey were coded and entered into a database using the Advanced Statistics Package for the Social Sciences (SPSS) (C. W. Wang et al., 2008). Data entry was validated by double entry and the two files compared for missing values and data entry errors. Any differences between the first and the second files were resolved by referring to the paper questionnaire.

Data analysis was performed using SPSS programme version 17 for windows. Data was assessed to ensure the assumptions of each test used were not violated. Simple descriptive statistics (i.e. mean, median, frequency, percentage and standard deviation) were used to describe the sample. Cronbach's alpha was used to

determine the reliability of the two multi-item scales (i.e. the WHOQOL-BREF and the WHOQOL-OLD) used in this study.

All participants were assigned to three groups based on the criteria of visual impairment: (1) those who had no difficulty seeing; (2) those who had difficulty seeing but did not meet the criteria of visual impairment; and (3) those who had difficulty seeing and met the criteria of visual impairment for comparison.

The groups were compared using either one-way analysis of variance (ANOVA) or chi-square (χ^2) depending on the level of data available for comparison. QOL scores were also compared across the groups using an analysis of covariance (ANCOVA) to determine the impact of visual impairment may have on QOL. In addition, a standard multiple regression analysis was performed to determine the extent to which factors thought to influence QOL predict variance in overall perception of QOL and to identify which variables make a unique contribution to this prediction.

The validity of these groups was assessed by comparing the groups on the scores from the sensory abilities facet of the WHOQOL-OLD. This was performed to see if those who had difficulty seeing may differ from those who met the criteria for visual impairment (i.e. 6/18 or worse in the better eye). The analyses indicated that only those who had difficulty with seeing and met the criteria for visual impairment were found to differ from those who did not (i.e. had no difficulty seeing and had difficulty seeing but did not meet the criteria for visual impairment) on the sensory function of the WHOQOL-OLD. Therefore, comparisons were conducted between those who met the criteria of visual impairment (i.e. 6/18 or worse in the better eye) and those who did not.

A Bonferroni adjustment was applied to account for multiple assessments and lower the risk of making a type I error. The original alpha level of 0.05 was adjusted by dividing it by the number of variables being tested (Pallant, 2007). For example, for the subscales of the 2 measures of QOL (i.e. 4 domains of the WHOQOL-BREF and 6 facets of the WHOQOL-OLD), the original 0.05 was divided by 10. The adjusted *p* value of 0.005 was set as the new level of significance to be considered.

3.5 Ethical considerations

Some parts of the questionnaire of this study contained sensitive questions, especially those related to intimacy. Furthermore, research with older persons needs to be handled with dignity, displaying welfare and protection of the participants, because these people may be vulnerable and experiencing many changes in social circumstances. Therefore, written consent was obtained from those participants who were literate and could read the form and sign for themselves. Those who were illiterate had the consent form read to them and oral consent was accepted.

However, all participants were informed of their right to refuse to participate, to decline to answer any given question, and to quit participating at any time. The researcher also explained about the objective of the study and assured each participant that their personal information would be kept strictly confidential and used only for this study. Only people who agreed to participate in this study were interviewed. This study was carried out in accordance with the tenets of the Treaty of Helsinki and was approved by the human ethics committee of Massey University Human Ethics Committee Southern: A (MUHEC: Southern A 09/54).

3.6 Summary

This chapter has described the methodology used in this study including sample size, sample selection, procedure and data collection instruments, steps of data collection, data management and data analysis. An overview of the variables and measurement has been provided. Ethical issues specific to the study of older persons have been outlined.

The study was conducted in Maha Sarakham province, Northeast Thailand, between September 2009 and January 2010. Five hundred people were randomly selected from a population of approximately 80,000 older people using a three level stratified sampling procedure. Once the sample was selected, participants were visited in their homes for data collection. Consent forms were obtained from those who agreed to participate in this study. All participants were asked to answer the questionnaire which included demographic details, a question assessing difficulty with seeing, and the WHOQOL-BREF and the WHOQOL-OLD to assess QOL. Those who answered to the question assessing difficulty with seeing affirmatively were assessed for their visual acuity. Those who did not meet the criteria of visual impairment by measured visual acuity were assessed for visual field using a field confrontation test.

Data analysis was performed using SPSS programme version 17 for windows and was assessed to ensure the assumptions of each test used were not violated. Participants were assigned to groups based on visual status for determining the prevalence of self-reported visual impairment and assessed visual impairment. Participants were assigned to groups based on self-reported and assessed visual function. The validity of the groupings was assessed by comparing the groups on the scores from the sensory abilities facet of the WHOQOL-OLD.

Comparisons were made across the groups on age, gender, education, economic status, overall perception of health, overall perception of QOL, the total scores of the WHOQOL-BREF and the WHOQOL-OLD. Reliability of the two multidimensional measures used in this study (i.e. the WHOQOL-BREF and the WHOQOL-OLD) were assessed using Cronbach's alpha. In addition, the model proposed to predict QOL among this population was assessed using a standard multiple regression.

This study was carried out in accordance with the tenets of the Treaty of Helsinki and was approved by the Human Ethics Committee, Massey University, New Zealand.

4.1 Introduction

This study was designed to estimate the prevalence of visual impairment among older persons in a rural area of Northeast Thailand, to examine the impact of visual impairment on QOL, and to explore the extent to which the proposed model used to explain the multidimensional relationships affecting QOL predicts variance in overall perception of QOL in this sample.

This chapter reports: (a) the demographic characteristics of the sample; (b) the prevalence of both self-reported and assessed visual impairment in the sample; (c) comparisons of age, gender, marital status, levels of education, economic hardship, number of health conditions, overall perception of health and all measures of QOL across those who met the criteria for assessed visual impairment and those who did not; (d) the impact of visual status on QOL when controlling for age, economic hardship and overall perception of health; and (e) those variables which were found to make a statistically significant contribution to the prediction of variance in overall perception of QOL in this sample.

4.2 Demographic characteristics of the participants

Using stratified random sampling, a total of 500 people were, selected from approximately 80,000 older persons living in non-municipal areas (rural areas) of Maha Sarakham province, and invited to participate in this study. All who were contacted agreed to participate. All participants were asked to fill out the

questionnaire which included demographic details, a single item which assessed perceived difficulty with seeing, and the WHOQOL-BREF and WHOQOL-OLD measures of QOL.

As can be seen in Table 4.1, participants ranged in age from 60 to 93 years with a mean age of 69.5 years ($SD = 6.78$). The majority (58.6%) were aged 60 to 69 years, 32.8% were aged 70 to 79 years, and 8.6% were 80 years and older. Just over 60% (62.2%) were female and 37.8% were male. The majority (60.0%) were married. Almost all (96.0%) had completed no more than 6 years of education. Most (66.0%) were employed in agriculture, 26.0% were retired or not in employment, and 8.0% were employed in trade. The median monthly income was 1,000 Baht (\$NZ40) and ranged from 500–25,000 Baht (\$NZ20-1,000). The majority (60.0%) indicated that they experienced some degree of economic hardship. When asked to identify the health conditions they had, more than half (57.4%) identified none, while the remainder identified one or more. When asked to rate their satisfaction with health, 60.4% stated that they were either satisfied or very satisfied, 16.6% were neither satisfied nor dissatisfied and 23.0% indicated that they were either dissatisfied or very dissatisfied. Over half (59.4%) reported they had difficulty with seeing to the degree that it interfered with their daily life, while 28.4% met the criteria for being identified as having a visual impairment (VI) (i.e. a visual acuity of 6/18 or worse in the better eye when wearing regular glasses or contact lenses, or a visual field of less than 30 degrees).

Table 4.1*Distribution of demographic characteristics of 500 participants*

Variable	Number	%
Age groups		
60-69	293	58.6
70-79	164	32.8
80-89	39	7.8
90 ⁺	4	0.8
Age (Mean \pm SD), (Range)	(69.54 \pm 6.78), (60-93)	
Gender		
Male	189	37.8
Female	311	62.2
Marital status		
Married	300	60.0
Separated/ Divorced	13	2.6
Widowed	172	34.4
Never married	15	3.0
Educational background		
0-6 years	480	96.0
7-12 years	10	2.0
13 years or more	10	2.0
Income	Median = 1,000, Range = 500-25,000	
Employment		
Not in employment/ retired	130	26.0
Employment in agriculture	330	66.0
Employment in trade	40	8.0
Health conditions		
None	287	57.4
1	135	27.0
2	56	11.2
3 or more	22	4.4

Table 4.1 (Continued)*Distribution of demographic characteristics of 500 participants*

Variable	Number	%
Economic hardship		
None at all	59	11.8
Not much	141	28.2
Moderate	225	45.0
Very much	69	13.8
Extreme	6	1.2
Perception of health		
Very satisfied	61	12.2
Satisfied	241	48.2
Neither satisfied nor dissatisfied	83	16.6
Dissatisfied	104	20.8
Very dissatisfied	11	2.2
Difficulty with seeing		
No	203	40.6
Yes	297	59.4
Visual status		
No difficulty with seeing	203	40.6
Difficulty with seeing but not VI	155	31.0
Difficulty with seeing and VI	142	28.4

4.3 Prevalence of visual disability and visual impairment

Of the 500 participants aged 60 years and older, 297 (59.4%) stated that they had difficulty with seeing to the degree that it interfered with their performance of daily activities. Of those, 142 (28.4%) had an assessed visual acuity of 6/18 or worse in the better eye when wearing their normal correction (glasses or contact lenses) and therefore met the criteria for visual impairment. The prevalence of both self-reported and assessed visual impairment increased with increasing age. As can be seen in Table 4.2, the percentage of those with a self-reported visual impairment increased from 59.4% for those aged 60 and older to 64.0% for those aged 65 and older, 77.7% for those aged 75 and older and 88.9% for those aged 85 and older. The percentage of those found to have an assessed visual impairment increased from 28.4% for those aged 60 and older to 30.1% for those aged 65 and older, 42.9% for those aged 75 and older and 50.0% for those aged 85 and older.

Table 4.2

Prevalence of self-reported and assessed visual impairment

Age	Total population	Self-reported VI		Assessed VI	
		n	%	n	%
60 ⁺	500	297	59.4	142	28.4
65 ⁺	375	240	64.0	113	30.1
75 ⁺	112	87	77.7	48	42.9
85 ⁺	18	16	88.9	9	50.0

4.4 Validity of groups

Visual disability was assessed by asking the participants to indicate difficulty with seeing using the question, “Do you have difficulty with seeing to the degree that it interferes with your daily life?” The options for responding were: no difficulty or difficulty. Those who identified difficulty were classified as having visual disability (i.e. self-reported visual impairment) and were assessed to see if they met the criteria for visual impairment. Those who met the criteria for visual impairment using both acuity and field tests were classified as being visually impaired (i.e. assessed visual impairment). From these, the participants were assigned to three groups: group 1 = those who had no difficulty seeing (n = 203); group 2 = those who had difficulty with seeing but did not meet the criteria for visual impairment (n = 155); and group 3 = those who had difficulty with seeing and met the criteria for visual impairment (n = 142).

The validity of these groups was then assessed by comparing the groups on the scores from the sensory abilities facet of the WHOQOL-OLD using a one-way analysis of variance (ANOVA). As can be seen in Table 4.3, a statistically significant difference across the groups was found on this score [$F(2, 497) = 6.88, p = 0.001$]. Follow-up analyses found statistically significant differences between groups 1 and 3, and 2 and 3, but not groups 1 and 2, on the sensory abilities facet of the WHOQOL-OLD. Those who had difficulty with seeing and met the criteria for visual impairment [i.e. group 3 (61.83, SD = 24.91)] were found to have a significantly lower mean score on the sensory abilities facet of the WHOQOL-OLD than those who did not [i.e. groups 1 (71.21, SD = 23.33) and 2 (69.27, SD = 23.05)].

As no statistically significant differences were found between the two groups (i.e. groups 1 and 2) who did not meet the criteria for visual impairment on the sensory abilities facet of the WHOQOL-OLD, they were collapsed to form a single group of those who had no visual impairment. All further analyses were conducted with these two remaining groups only [i.e. group 1 = those who did not meet the criteria for visual impairment (n = 358), group 2 = those met the criteria for visual impairment (n = 142)].

Table 4.3

Comparison across the groups on sensory abilities facet of the WHOQOL-OLD

Group	1 (n=203)		2 (n=155)		3 (n=142)		F	p
Variables	Mean	SD	Mean	SD	Mean	SD		
Sensory abilities	71.21	23.33	69.27	23.05	61.83	24.91	6.88	0.001*
Follow up	Variable						Mean difference	p
Sensory abilities								
	No difficulty seeing (1) - Difficulty seeing but not VI (2)						1.94	0.724
	No difficulty seeing (1) - Difficulty seeing and VI (3)						9.37	0.001*
	Difficulty seeing but not VI (2) - Difficulty seeing and VI (3)						7.43	0.020*

* Significant ($p \leq 0.05$)

4.5 Comparison across the groups

Participants were assigned to two groups based on their visual status [i.e. group 1 = those who did not meet the criteria for visual impairment (n = 358) and group 2 = those who met the criteria for visual impairment (n= 142)] and compared on gender, marital status, educational background, age, economic hardship, number of health conditions, overall perception of health, overall perception of QOL, total score of the WHOQOL-BREF, and total score of the WHOQOL-OLD. A one-way analysis of variance (ANOVA) was performed to determine if the two groups of participants differed on those variables. Preliminary checks using descriptive analyses, homogeneity of variances, and mean plot were performed to ensure that there was no violation of the assumptions of normality, linearity, homogeneity of variances, homogeneity of regression slopes, and reliable measurement of the covariate. No violation of these assumptions was found. Chi square (χ^2) was used to test for differences among two groups for data measured on nominal scales while *F*-test was used to test the differences in means among two or more groups for data measured on interval scales.

Two standard measures (i.e. the WHOQOL-BREF and the WHOQOL-OLD) were used to assess QOL in this study. Both the WHOQOL-BREF and WHOQOL-OLD were rated on a 5-point scale ranging from “Not at all” (a score of 1) through to “Completely” (a score of 5). Higher scores indicate a better QOL. The reliability of both measures were checked and found to have a very good internal consistency with Cronbach’s alpha coefficients above the acceptable value of 0.70 (Pallant, 2007) with 0.91 and 0.83 found for the WHOQOL-BREF and for the WHOQOL-OLD respectively.

As can be seen in Table 4.4, statistically significant differences were found across the groups on age [$F(2, 497) = 17.49, p < 0.001$], economic hardship [$F(2, 497) = 5.14, p = 0.024$], overall perception of health [$F(2, 497) = 6.10, p = 0.014$], total score of the WHOQOL-BREF [$F(2, 497) = 13.97, p < 0.001$], and total score of the WHOQOL-OLD [$F(2, 497) = 11.53, p = 0.001$]. No statistically significant differences were found on gender [$\chi^2(2, N = 500) = 0.92, p = 0.339$], marital status [$\chi^2(2, N = 500) = 0.42, p = 0.517$], level of education [$\chi^2(2, N = 500) = 3.47, p = 0.063$], number of health conditions reported [$F(2, 497) = 0.40, p = 0.526$], and overall perception of QOL [$F(2, 497) = 2.34, p = 0.127$].

On follow-up (see table 4.5), significant differences were found on all four domains of the WHOQOL-BREF {i.e. physical health [$F(1,498) = 11.12, p = 0.001$], psychological [$F(1,498) = 8.30, p = 0.004$], social relationships [$F(1,498) = 7.91, p = 0.005$] and environment [$F(1,498) = 7.83, p = 0.005$]} and 4 of the 6 facets of the WHOQOL-OLD {i.e. sensory abilities [$F(1,498) = 13.19, p < 0.001$], autonomy [$F(1,498) = 5.98, p = 0.015$], past present and future [$F(1,498) = 5.79, p = 0.016$], and social participation [$F(1,498) = 7.65, p = 0.006$]}. As can be seen in Table 4.5, no statistically significant differences were found on the death and dying [$F(1,498) = 0.06, p = 0.806$], and intimacy [$F(1,498) = 0.48, p = 0.491$] facets of the WHOQOL-OLD.

However, when a Bonferroni adjustment (Pallant, 2007) was applied, the only measures found to meet the new criteria for statistical significance (i.e. $p = 0.05/10 = 0.005$) were the physical health and psychological domains of the WHOQOL-BREF and the sensory abilities facet of the WHOQOL-OLD. Those who had met the criteria for visual impairment were found to have lower scores on the physical health

and psychological domains of the WHOQOL-BREF and the sensory abilities facet of the WHOQOL-OLD than those who did not.

Table 4.4

Comparisons across the groups on gender, age, economic hardship, number of health conditions, overall perception of health, and the total scores of the WHOQOL-BREF and the WHOQOL-OLD

Variables	1 (n=358)		2 (n=142)		χ^2	<i>p</i>
	No visual impairment		Visual impairment			
	n	%	n	%		
Gender					0.92	0.339
Male	140	39.1	49	34.5		
Female	218	60.9	93	65.5		
Marital status					0.42	0.517
Married	218	60.9	82	57.8		
Lived alone	140	39.1	60	42.2		
Education					3.47	0.063
0-6 years	340	95.0	140	98.6		
7+ years	18	5.0	2	1.4		
Variables	Mean	SD	Mean	SD	F	<i>p</i>
Age	68.75	6.29	71.52	7.55	17.49	0.000*
Economic hardship	2.59	0.89	2.79	0.92	5.14	0.024*
Number of health conditions	0.62	0.89	0.68	0.88	0.40	0.526
Perception of health	3.54	0.97	3.30	1.12	6.10	0.014*
Perception of QOL	3.53	0.78	3.41	0.81	2.34	0.127
Total WHOQOL-BREF	66.30	12.08	61.64	13.68	13.97	0.000*
Total WHOQOL-OLD	67.50	11.61	63.57	11.77	11.53	0.001*

* Significant ($p \leq 0.05$)

Table 4.5

Follow-up on the four domains of the WHOQOL-BREF and the six facets of the WHOQOL-OLD

Variables	Group		1 (n=358)		2 (n=142)		F	p
	All (n= 500)		No visual impairment		Visual impairment			
	Mean	SD	Mean	SD	Mean	SD		
WHOQOL-BREF								
Physical health	60.72	19.05	62.50	18.31	56.26	20.20	11.12	0.001**
Psychological	71.22	14.35	72.38	13.80	68.31	15.32	8.30	0.004**
Social relationships	75.03	13.78	76.12	13.17	72.30	14.90	7.91	0.005*
Environment	61.15	12.00	62.09	11.44	58.78	13.06	7.83	0.005*
WHOQOL-OLD								
Sensory abilities	67.95	23.98	70.37	23.20	61.84	24.91	13.19	0.000**
Autonomy	65.36	17.59	66.57	17.39	62.32	17.79	5.98	0.015*
Past, present and future	59.35	15.89	60.42	15.16	56.64	17.38	5.79	0.016*
Social participation	67.50	17.51	68.85	17.21	64.08	17.84	7.65	0.006*
Death and dying	63.95	32.18	54.17	31.52	53.39	33.90	0.06	0.806
Intimacy	71.47	14.67	71.74	14.54	70.73	15.04	0.48	0.491

* Significant ($p \leq 0.05$)

** Significant after Bonferroni adjustment ($p \leq 0.005$)

4.6 The impact of visual impairment on QOL after controlling for age, economic hardship, and overall perception of health

As differences were found between the groups on age, economic hardship and overall perception of health, the groups were compared again on the 4 domains of the WHOQOL-BREF and the 6 facets of the WHOQOL-OLD, while controlling for age, economic hardship and overall perception of health to remove the influence of these three variables on those scores. The analysis of covariance (ANCOVA) was performed to determine if the two groups of participants [i.e. group 1 = those who had no visual impairment (n = 358) and group 2 = those who had visual impairment (n = 142)] differed on the 10 discrete measures of QOL (i.e. physical health, psychological, social relationships, and environment domains which made up the total score of the WHOQOL-BREF, and sensory abilities, autonomy, past present and future, social participation, death and dying, and intimacy, which made up the total score of the WHOQOL-OLD) while controlling for age, economic hardship, and overall perception of health. Preliminary checks using descriptive statistics, estimates of effect size, preliminary correlation analyses, scatter plots, and homogeneity of regression slopes were performed to ensure that there was no violation of the assumptions of normality, linearity, homogeneity of variances, homogeneity of regression slopes, and reliable measurement of the covariate. No violation of these assumptions was found.

As can be seen in Table 4.6, when controlling for age, economic hardship, and satisfaction with health, statistically significant differences was found on the sensory abilities facet of the WHOQOL-OLD [$F(1,498) = 8.28, p < 0.004$] only. No statistically significant differences were found on any domains of the WHOQOL-

BREF and the other 5 of the facets of the WHOQOL-OLD. Those who met the criteria for visual impairment were found to have a lower score of the sensory abilities facet of the WHOQOL-OLD than those who did not.

Table 4.6

Comparisons across the groups on 4 domains of WHOQOL-BREF and 6 facets of WHOQOL-OLD while controlling for age, economic hardship, and overall perception of health

Variables	Group		1 (n=358)		2 (n=142)		F	p
	All (n= 500)		No visual impairment		Visual impairment			
	Mean	SD	Mean	SD	Mean	SD		
WHOQOL-BREF								
Physical health	60.72	19.05	62.50	18.31	56.26	20.20	1.45	0.229
Psychological	71.22	14.35	72.38	13.80	68.31	15.32	1.48	0.225
Social relationships	75.03	13.78	76.12	13.17	72.30	14.90	2.88	0.090
Environment	61.15	12.00	62.09	11.44	58.78	13.06	0.44	0.510
WHOQOL-OLD								
Sensory abilities	67.95	23.98	70.37	23.20	61.84	24.91	8.28	0.004**
Autonomy	65.36	17.59	66.57	17.39	62.32	17.79	1.36	0.245
Past, present and future	59.35	15.89	60.42	15.16	56.64	17.38	0.01	0.921
Social participation	67.50	17.51	68.85	17.21	64.08	17.84	0.71	0.400
Death and dying	63.95	32.18	54.17	31.52	53.39	33.90	0.06	0.812
Intimacy	71.47	14.67	71.74	14.54	70.73	15.04	0.04	0.837

* Significant ($p \leq 0.05$)

** Significant after Bonferroni adjustment ($p \leq 0.005$)

4.7 The model to predict the overall perception of QOL for older persons living in a rural area of Northeast Thailand

A standard multiple regression analysis was carried out to determine the extent to which the 17 independent variables included in the model proposed in Chapter One to predict the variance in the overall perception of QOL (the dependent variable). These variables were: age, gender, levels of education, economic status, overall perception of health, health conditions, visual impairment, the physical health, psychological, social relationships, and environment domains of the WHOQOL-BREF, and the sensory abilities, autonomy, past present and future, social participation, death and dying, and intimacy facets of the WHOQOL-OLD (the independent variables).

Correlations were run to check the assumptions of multicollinearity and singularity to ensure that all independent variables entered in the equation were at least minimally correlated ($r \leq 0.3$) with the dependent variable but not too highly correlated ($r \geq 0.7$) with another independent variable (Pallant, 2007). Other assumptions concerning outliers, normality, linearity, homoscedasticity, and independence of residuals were also assessed. No assumptions underlying the use of multiple regression were found to be violated.

As can be seen in Table 4.7, age, gender, levels of education, economic status, health conditions, visual impairment, and the sensory abilities and death and dying facets of the WHOQOL-OLD) were not found to meet the assessment of being at least minimally correlated with the dependent variable. Therefore, they were not included in the regression model. One variable (i.e. past present and future facet of the WHOQOL-OLD) was found to be too highly correlated with other independent

variables [i.e. the physical health (0.753), psychological (0.717), and environment (0.834) domains of the WHOQOL-OLD] and therefore, was also not entered into the regression model.

The remaining eight independent variables were then entered into the equation for further analyses (i.e., overall perception of health, physical health, psychological, social relationships, environment, autonomy, social participation, and intimacy). As can be seen in Table 4.8, the model explains 45.6% of variance (adjusted $R^2 = 0.456$) in the overall perception of QOL, which is a statistically significant amount [$F(8, 491) = 53.37, p < 0.001$]. Five of the eight independent variables were found to make a unique and statistically significant contribution to that prediction. They were: the psychological domain of the WHOQOL-BREF ($\beta = 0.301, p < 0.001$); overall perception of health ($\beta = 0.226, p < 0.001$); and the intimacy facet of the WHOQOL-OLD ($\beta = 0.192, p < 0.001$); the environment domain of the WHOQOL-BREF ($\beta = 0.132, p < 0.013$); and the physical health domain of the WHOQOL-BREF ($\beta = 0.107, p < 0.044$) with the psychological domain; overall perception of health, and intimacy facet making the greatest contributions. The remaining three variables: the social relationships domain of the WHOQOL-BREF, and the autonomy, and social participation facets of the WHOQOL-OLD were not found to make a unique and significant contribution to this prediction.

Table 4.7

Correlation matrix of dependent and independent variables under study

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Overall perception of QOL																	
2. Age	-.041																
3. Gender	-.056	.107**															
4. Education	-.070	-.152**	-.178**														
5. Economic	-.169**	-.063	-.061	.024													
6. Overall perception of health	.539**	-.125**	-.070	-.015	-.093*												
7. Health conditions	.232**	-.030	-.154**	-.033	-.058	.337**											
8. Visual status	-.068**	.236**	.100*	-.106**	.093*	-.162**	-.040										
9. Physical health	.502**	-.252**	-.128**	.004	-.121**	.655**	.388**	-.213**	.606**								
10. Psychological	.618**	-.116**	-.013	.000	-.171**	.613**	.183**	-.164**	-.164**	.552**							
11. Social relationships	.384**	-.149**	-.046	-.019	-.027	.335**	.112**	-.200**	.443**	.543**	.231**						
12. Environment	.528**	-.251**	-.099*	-.000	-.157**	.491**	.184**	-.199**	.626**	.673**	.228**	.231**					
13. Sensory abilities	.227**	-.060	-.028	.055	-.082*	.274**	.146**	-.155**	.394**	.303**	.401**	.472**	.127**				
14. Autonomy	.326**	-.219**	-.100*	.043	.008	.288**	.224**	-.171**	.463**	.441**	.401**	.472**	.127**	.489**			
15. Past, present and future	.537**	-.246**	-.121**	.061	-.165**	.537**	.243**	-.168**	.753**	.717**	.503**	.834**	.279**	.279**	.599**		
16. Social participation	.405**	-.244**	-.047	-.051	-.080*	.508**	.227**	-.189**	.608**	.516**	.429**	.626**	.244**	.458**	.007	.000	
17. Death and dying	.068	-.005	-.093*	.106**	-.092*	.138**	.128**	-.014	.167**	.019	.057	.008	.190**	.007	.051	.000	
18. Intimacy	.393**	-.030	.026	-.020	-.018	.190**	.033	-.054	.198**	.424**	.497**	.403**	.086*	.389**	.337**	.309**	-.001

** Correlation is significant at 0.01 (2-tailed)

* Correlation is significant at 0.05 (2-tailed)

1. Overall perception of QOL

2. Age

3. Gender

4. Education levels

5. Economic hardship

6. Overall perception of health

7. Health conditions

8. Visual status

9. Physical health

10. Psychological

11. Social relationships

12. Environment

1= very dissatisfied, 2= dissatisfied, 3= neither satisfied nor dissatisfied, 4= satisfied, 5= very satisfied

number of years at the last birthday

1= male, 2= female

1= 0-6 years, 2= 7-12 years, 3= 13 years or more

1= none at all, 2= not much, 3= moderate, 4= very much, 5= extreme

1= very dissatisfied, 2= dissatisfied, 3= neither satisfied nor satisfied, 4= satisfied, 5= very satisfied

1= yes, 2= no

1= no difficulty seeing, 2= difficulty seeing, 3= visual impairment

1= not at all, 2= not much, 3= moderately, 4= very much, 5= extreme amount

1= not at all, 2= not much, 3= moderately, 4= very much, 5= extreme amount

1= not at all, 2= not much, 3= moderately, 4= very much, 5= extreme amount

1= not at all, 2= not much, 3= moderately, 4= very much, 5= extreme amount

13. Sensory abilities
 1= not at all, 2= not much, 3= moderately, 4= very much, 5= extreme amount
14. Autonomy
 1= not at all, 2= not much, 3= moderately, 4= very much, 5= extreme amount
15. Past, present and future
 1= not at all, 2= not much, 3= moderately, 4= a great deal, 5= completely
16. Social participation
 1= not at all, 2= not much, 3= moderately, 4= a great deal, 5= completely
17. Death and dying
 1= not at all, 2= not much, 3= moderately, 4= very much, 5= extreme amount
18. Intimacy
 1= not at all, 2= not much, 3= moderately, 4= very much, 5= extreme amount

Table 4.8

Standard multiple regression of overall perception of health, physical health, psychological, social relationships, environment, autonomy, social participation, and intimacy as predictors of overall perception of QOL among older persons living in a rural area of Northeast Thailand

<i>Variables entered</i>	<i>R</i>	<i>R²</i>	<i>Adj. R²</i>	<i>F</i>	<i>p</i>	<i>β</i>	<i>p</i>
Model	0.682	0.465	0.456	53.37	0.000**		
Overall perception of health						0.226	0.000**
Physical health						0.107	0.044*
Psychological						0.301	0.000**
Social relationships						-0.046	0.299
Environment						0.132	0.013*
Autonomy						-0.021	0.612
Social participation						-0.044	0.349
Intimacy						0.192	0.000**

* Significant ($p \leq 0.05$)

** Significant ($p \leq 0.001$)

4.8 Summary

The results have described the demographic characteristics of older persons who participated in this study. The study found a high rate of self-reported visual impairment (59.4%) and assessed visual impairment (28.4%). The prevalence of both self-reported visual disability and assessed visual impairment were also found to increase with increasing age. The percentage of those who reported having difficulty with seeing increased from 59.4% for those aged 60 and older to 64.0% for those aged 65 and older, 77.7% for those aged 75 and older, and 88.9% for those aged 85 and older. The rate for those who met the criteria for visual impairment increased from 28.4% for those aged 60 and older to 30.1% for those aged 65 and older, 42.9% for those aged 75 and older, and 50.0% for those aged 85 and older.

The participants were assigned to three groups based on their visual status [group 1 = those who had no difficulty seeing (n = 203), group 2 = those who had difficulty with seeing but did not meet the criteria for visual impairment (n = 155), and group 3 = those who had difficulty with seeing and met the criteria for visual impairment (n = 142)]. The validity of these groups was assessed by comparing the groups on the scores from the sensory abilities facet of the WHOQOL-OLD. A statistically significant difference across the groups was found on this score. The follow-up analyses indicated that statistically significant differences were found between groups 1 and 3, and 2 and 3, but not 1 and 2, on the sensory abilities facet of the WHOQOL-OLD. Those who had difficulty with seeing and met the criteria for visual impairment (i.e. group 3) were found to have a statistically significantly lower mean score on the sensory abilities facet of the WHOQOL- OLD than those who did not (i.e. groups 1 and 2).

As no statistically significant differences were found between the two groups (i.e. groups 1 and 2) who did not meet the criteria for visual impairment on the sensory abilities facet of the WHOQOL-OLD, they were collapsed to form a single group of those who had no visual impairment. The participants were then assigned to two groups based on the criteria for visual impairment [i.e. group 1 = those who did not meet the criteria for visual impairment (n = 358) and group 2 = those who met the criteria for visual impairment (n= 142)] and compared on age, gender, overall perception of health, and all measures of QOL.

Statistically significant differences were found between groups on age, economic hardship, overall perception of health, total score of the WHOQOL-BREF and total score of the WHOQOL-OLD. Those who met the criteria for visual impairment (i.e. group 2) were found to be older, to have a higher degree of economic hardship, and have a lower score of overall perception of health, the total score of the WHOQOL-BREF and the WHOQOL-OLD than those who did not meet the criteria for visual impairment (i.e. group 1).

On follow-up analyses, statistically significant differences were found between groups on all four domains of the WHOQOL-BREF (i.e. physical health, psychological, social relationships, and environment) and 4 of the 6 facets of the WHOQOL-OLD (i.e. sensory abilities, autonomy, past present and future, and social participation). No statistically significant differences were found on the death and dying and intimacy facets of the WHOQOL-OLD. When a Bonferroni adjustment was applied, however, the only 3 measures found to meet the new criteria for statistical significance were the physical health and psychological domains of the WHOQOL-BREF and the sensory abilities facet of the WHOQOL-OLD. Those who had met the criteria for visual impairment were found to have lower scores on the

physical health and psychological domains of the WHOQOL-BREF and the sensory abilities facet of the WHOQOL-OLD than those who did not.

As differences were found between the groups on age, economic hardship and overall perception of health, the groups were compared again on the 10 subscales measures of QOL while controlling for the effects of age, economic hardship, and overall perception of health. Statistically significant difference between the groups was found on the sensory abilities facet of the WHOQOL-OLD only.

A standard multiple regression analysis was performed among older persons living in a rural area of Northeast Thailand with the overall perception of QOL serving as the dependent variable and 17 factors thought to influence the overall perception of QOL according to the proposed model serving as the independent variables to determine the extent to which variance in these variables affect variance in the overall perception of QOL in this sample. Only eight variables were found to be at least minimally correlated with overall perception of QOL and therefore only these were entered into this equation.

The eight variables found to be at least minimally correlated with the dependent variable accounted for 45.6% of the variance in the score of the overall perception of QOL. Only the scores from the psychological domain of the WHOQOL-BREF, overall perception of health, and the intimacy facet of the WHOQOL-OLD, environment and physical health domains of the WHOQOL-BREF were found to make a unique contribution to this prediction with the psychological domain, overall perception of health, and intimacy facet making the greatest contributions.

Chapter Five provides a discussion of these findings.

5.1 Introduction

The purpose of this study was to: (1) identify the rate of visual impairment among older persons living in Northeast Thailand using both clinical and self-reported measures of visual impairment; (2) to examine the impact of visual impairment on QOL in this sample; and (3) to assess the extent to which the model proposed predicts variance in overall perception of QOL in this population.

This chapter provides an interpretation and discussion of the findings in relation to previous studies, as well as the implication of the findings, the limitations of this study, and suggestions for further research.

5.2 Participants

This study was conducted among persons aged 60 and older living in Maha Sarakham province, Northeast Thailand, from September 2009 to January 2010. All 500 individuals contacted agreed to participate in this study. They were randomly selected from those registered with the HCIS database living in rural areas of Maha Sarakham province. The participants ranged in age from 60 to 93 years with a mean age of 69.5 ($SD = 6.78$). The majority of participants were female (62.2%) reflecting a difference in life expectancy across the genders in Thailand (71 years for males and 76 years for females) (Ministry of Public Health of Thailand, 2010; UNFPA, 2006).

Almost all participants had completed no more than 6 years of education, which is common among older people in the country (National Statistical Office of

Thailand, 2003). The median income of this sample (1,000 Baht or 40 NZD) was below the official poverty line of 1,338 Baht per month (United Nations Development Programme, 2005). The majority of the participants (60%) in this study stated that they experience some degree of economic hardship.

5.3 The prevalence of self-reported and assessed visual impairment

As stated earlier, this study was interested in determining the prevalence of both self-reported and assessed visual impairment among older persons living in a rural area of Northeast Thailand. Self-reported visual impairment was identified as a positive response to the question “Do you have difficulty with seeing to the degree that it interferes with performing your daily activities?” Assessed visual impairment was defined as having an assessed visual acuity of 6/18 or worse in the better eye when wearing normal correction or a visual field of less than 30 degrees at its widest angle. However, none of those assessed for restricted visual field (i.e. 30 degrees) were found to meet this criterion for visual impairment. This study found the prevalence of self-reported visual impairment to be 59.4% and the prevalence of assessed visual impairment to be 28.4%.

The proportion of self-reported visual impairment (all those who reported difficulty with seeing, including those who met the criteria for assessed visual impairment) (59.4%) found in this study was 3.5 times higher than the median rate identified in the literature review for self-reported visual impairment (16.8%). However, the former reflects the rates found in both developed and developing countries. It should be noted that the most common causes of visual impairment worldwide are uncorrected refractive errors including presbyopia, followed by cataracts and glaucoma; all of which are preventable or treatable (Pascolini &

Mariotti, 2011; WHO, 2011). While refractive errors can easily be corrected by glasses or contact lenses, cataracts can usually be treated with surgery, and visual loss due to glaucoma can be controlled with eye drops (Dandona & Dandona, 2006b; Lee, 2007; Shoemaker, 2002). There are many barriers to access vision and eye care in developing countries such as the availability of eye care in general, the relatively long distance required to travel to obtain eye care and treatment, and the availability of cataract surgery in particular (Dandona & Dandona, 2006b; Dineen et al., 2007; Gilbert et al., 2008; Holden et al., 2008; Kuper et al., 2008; van Groenou, Glaser, Tomassini, & Jacobs, 2006). As a result, the rate of visual impairment is generally found to be higher in developing countries than in developed countries.

When compared to the rate of self-reported visual impairment in developing countries only, the rate in the current study was just 1.1 times higher than the median rate identified for these countries (51.85%) and just 1.2 times higher than that found in a previous study using the same criteria of self-reported visual impairment with a sample of the same age in this region (47.8%) (La Grow, Sudnongbua, et al., 2011). The latter may be due to the difference in sampling, as this group was specifically selected to be representative of those living in rural areas only, while earlier sample was selected from both rural and urban areas, restricted to those who had had children and limited to one participant per household only.

The prevalence of assessed visual impairment found in this study was 28.4%, a rate 1.8 times higher than the median rate identified in the review of literature using the same definition (15.8%). This higher rate may also be due to the fact that the median rate found in the review of literature included data from both developed and developing countries. As stated earlier, the rate of visual impairment is expected to be higher in developing countries due to a lack of available treatment, or finances

limiting access to eye care, or a combination of both (Dineen et al., 2007; Rozhan et al., 2009).

The rate of assessed visual impairment found in this study was also 1.4 times higher than the median rate reported for developing countries (i.e. 20.1%). This was also expected as this study was specifically conducted in a rural area where treatment of visual disability may be even more limited due to lack of health resources to provide eye care services than found nationwide (Dandona & Dandona, 2006b). This assumption was verified when the rate found in this study was 1.3 times higher than the estimated rate reported for the country as a whole, with the same age group, and with the same definition of visual impairment (National Statistical Office of Thailand, 2002) (22.0%).

The higher rate of assessed visual impairment in the rural areas could reflect the unequal distribution of doctors and nurses or other health workers within the country, resulting in lack of eye care and treatment services in rural areas. This is compounded by the distances that people in this area have to travel to access whatever treatment is available, as the majority of health resources are concentrated in urban rather than rural areas (Wibulpolprasert et al., 2004).

The rate of visual impairment was also expected to increase with increasing age (Bekibele & Gureje, 2008b; Esteban et al., 2008; Evans et al., 2002; Horowitz et al., 2005; Jin & Wong, 2008; Michon et al., 2002; Song et al., 2010; Wong et al., 2008). As expected, the rates of both self-reported and assessed visual impairment were found to increase with increasing age in this study. The rate of self-reported visual impairment was found to increase from 59.4% for those 60 years and older to 64.0% for those 65 years and older, and 77.7% for those 75 years and older to 88.9% for those 85 years and older. The rate of assessed visual impairment was found to

increase from 28.4% for those 60 years and older to 30.1% for those 65 years and older, and 42.9% for those 75 years and older to 50.0% for those 85 years and older. The pattern found here was similar to that found in the literature reviewed here (Bekibele & Gureje, 2008b; Esteban et al., 2008; Evans et al., 2002; Horowitz et al., 2005; Jin & Wong, 2008; Michon et al., 2002; Song et al., 2010; Wong et al., 2008).

When planning this study, it was assumed that the rate of assessed visual impairment for those 60 years and older found here would be higher than that estimated for the same age countrywide as this data was conducted in Northeast region, the poorest and the most rural in the country. This assumption was confirmed.

It was also proposed that both self-reported and assessed visual impairment would increase with increasing age as identified in the literature. This assumption was also confirmed.

Finally, the high rate of self-reported visual impairment found by La Grow, Sudnongbua, et al., (2011) for this region needed to be verified with a sample specifically selected for this purpose as that study was conducted to assess the impact of feelings of abandonment among older persons and not for assessing the rate of visual impairment. This was done in this study. The rate of self-reported visual impairment found here (59.4%) was 1.2 times higher than that reported by La Grow, Sudnongbua, et al., (2011) (47.8%).

5.4 Factors influencing the prevalence of visual impairment

It was found that the rate for self-reported visual impairment was 2.1 times higher than that found for assessed visual impairment. However, when the validity of the groupings was assessed in terms of sensory function, those who identified having

difficulty with seeing (i.e. self-reported visual impairment) were not found to differ from those who reported no difficulty seeing. Only those who met the criteria for visual impairment (i.e. 6/18 or worse in the better eye) were found to differ from those who did not (i.e. had no difficulty seeing and had difficulty seeing but did not meet the criteria for visual impairment) on the sensory function facet of the WHOQOL-OLD.

Therefore, comparisons on variables thought to influence the prevalence of visual impairment (i.e. age, gender, education, economic status, and overall perception of health) were made between these two groups only (i.e. those who met the criteria of visual impairment and those who did not).

Those who were visually impaired were found to be older (Bekibele & Gureje, 2008b; Chia et al., 2003; Esteban et al., 2008; Evans et al., 2002; Horowitz et al., 2005; Jin & Wong, 2008; Michon et al., 2002; Nirmalan et al., 2002; Song et al., 2010; Wong et al., 2008), worse off economically (Horowitz et al., 2005; La Grow et al., 2009; Michon et al., 2002), and in poorer health (Bekibele & Gureje, 2008a, 2008b; Chia et al., 2004; Jin & Wong, 2008; La Grow, Alpass, et al., 2011; La Grow, Sudnongbua, et al., 2011; Lamoureux et al., 2009; Vu et al., 2005; C. W. Wang et al., 2008; Zimdars et al., 2012) than those who were not, confirming the findings from previous studies.

These findings may reflect the fact that some chronic eye conditions take time to develop as a result of the normal part of aging (e.g. age-related cataract and presbyopia) and others are also related to other long term chronic health conditions (e.g. diabetic retinopathy) (Lee, 2007; Resnikoff et al., 2004; Shoemaker, 2002). In addition, access to eye services may be limited due to treatment cost, as the median income of this sample was found to be below the poverty line and the majority stated

that they experienced some degree of economic hardship. It could also be true that the people may have uncorrected refractive errors affecting their function. This may be especially true for presbyopia which is an age-related refractive error whose incidence increases rapidly after the age of 40 (Holden et al., 2008) as found in other low income countries (Dineen et al., 2007; Gilbert et al., 2008; Kuper et al., 2008; van Groenou et al., 2006). However, this can only be speculated on as this study did not investigate the causes of visual impairment, including the rate of uncorrected or undercorrected refractive error, or the availability of treatment in this area due to a lack of reliable diagnostic information available for participants of this study (La Grow, Sudnongbua, et al., 2011).

Low income has also been linked to the ability to meet basic needs, as people with lower income have been found to have difficulty in maintaining their health (Horowitz et al., 2005; Michon et al., 2002). The current study found that those who were visually impaired were older, more economically disadvantaged, and in poorer health than those who were not.

No differences were found between the groups on gender and levels of education contrary to the expectation that those who were visually impaired would be disproportionately female and have lower levels of education than those who were not. It is not clear why differences on gender were not found. However, in terms of levels of education, it appears that there was very little variation in the levels of education across the participants, with over 90% of the sample having completed no more than 6 years of formal education. As a result, they had little chance to differ on their education levels.

The findings also differed from those reported from the previous study (La Grow, Sudnongbua, et al., 2011) conducted in this area where no differences on any

of these variables were found across the groups. While it is not clear why this would be so, it may be due to the differences in sampling as the sample in that study was selected for another purpose.

5.5 The impact of visual impairment on quality of life

This study was also interested in determining the impact of visual impairment on QOL among older persons living in a rural area of Northeast Thailand. The groups were compared on their overall perception of QOL, and the total score of the WHOQOL-BREF, and the WHOQOL-OLD.

It should be noted that overall perception of QOL was examined by responses to the question “How would you rate your quality of life?”. Overall perception of QOL is defined by the “individuals’ perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns” (WHO, 1996, p. 5).

Similar to the previous study conducted in this area (La Grow, Sudnongbua, et al., 2011), no statistically significant differences were found between the groups on overall perception of QOL. This is not surprising as those who were visually impaired, and those who were not were found to have similar levels of education, perform the same types of work, share the same religious beliefs and traditional cultural practices and reside in similar environments (La Grow, Sudnongbua, et al., 2011). Therefore, it is to be expected that they perceive their overall QOL to be similar regardless of visual status as they were all poor, in poor health, and had low levels of education.

While overall perception of QOL focuses on individual’s “perceived” QOL only, the two multidimensional measures of QOL used in this study (i.e. the

WHOQOL-BREF and the WHOQOL-OLD) focus on a range of factors thought to affect QOL. The WHOQOL-BREF assesses QOL within four different contexts including physical health, psychological health, social relationships, and the relationship to salient features of the environment (WHO, 1996), and the WHOQOL-OLD assesses sensory abilities; autonomy; past, present and future activities; social participation; death and dying; and intimacy (WHO, 2006).

Similar to earlier studies, visual impairment was found to have a statistically significant effect on the multidimensional measures of QOL (Bekibele & Gureje, 2008a; La Grow, Sudnongbua, et al., 2011). Follow-up analyses on the 4 domains of the WHOQOL-BREF (i.e. physical health, psychological, social relationships, and environment), and the six facets of the WHOQOL-OLD (i.e. sensory abilities, autonomy, past present and future, social participation, death and dying and intimacy) found statistically significant differences between the groups on the physical health ($p = 0.001$), psychological ($p = 0.004$), social relationships ($p = 0.005$), and environment ($p = 0.005$) domains of the WHOQOL-BREF and the sensory abilities ($p = 0.000$), autonomy ($p = 0.015$), past present and future ($p = 0.016$), and social participation ($p = 0.006$) facets of the WHOQOL-OLD. Those who met the criteria for visual impairment were found to have lower scores on the physical health (56.26 vs. 62.50), psychological (68.31 vs. 72.38), social relationships (72.30 vs. 76.12), and environment (58.78 vs. 62.09) domains of the WHOQOL-BREF and the sensory abilities (61.84 vs. 70.37), autonomy (62.32 vs. 66.57), past present and future (56.64 vs. 60.42), and social participation (64.08 vs. 68.85) facets of the WHOQOL-OLD than those who did not. No statistically significant differences were found on the death and dying and intimacy facets of the WHOQOL-OLD.

However, when a Bonferroni adjustment was applied to control for an increased risk of type I error due to repeated assessment (Pallant, 2007), statistically significant differences were found on the physical health ($p = 0.001$) and psychological ($p = 0.004$) domains of the WHOQOL-BREF and the sensory abilities ($p < 0.001$) facet of the WHOQOL-OLD only. This reflects the fact that the differences between the groups on the other variables (i.e. about 4 points, ranging from 3 to 6) were simply not great enough to hold up after this adjustment was made.

The findings related to QOL in this study were identical to those reported by La Grow, Sudnongbua, et al. (2011) up to this point. However, as statistically significant differences on age, economic hardship and overall perception of health were found between the groups in this study, comparisons were made again while controlling for these three variables. After doing so, a statistically significant difference was found on the sensory abilities facet of the WHOQOL-OLD ($p = 0.004$) only. It should be noted that the study by La Grow, Sudnongbua, et al. (2011) was conducted with self-reported visual impairment while the comparisons carried out in this study were conducted with assessed visual impairment only.

The findings from this study found that visual impairment did not, in fact, have an impact on QOL once the possible confounding effects of age, economic status and overall perception of health were controlled for. This finding is contrary to the expectation found in the literature reviewed that those who are visually impaired are more likely to experience depressed states from isolation (La Grow et al., 2009), to have greater levels of difficulty with activities of daily living (Bekibele & Gureje, 2008b; Steinman & Allen, 2011), and statistically significantly lower scores on the HRQOL, (Nutheti et al., 2006), the VFQOL (Tran et al., 2011), the NHVQOL (Lamoureux et al., 2009), the NEI-VFQ-25 (C. W. Wang et al., 2008), the

WHOQOL-BREF (Bekibele & Gureje, 2008a; La Grow, Alpass, et al., 2011), and the WHOQOL-OLD (La Grow, Sudnongbua, et al., 2011), than those who are not. This may be due to differences in religious beliefs and cultural traditions including lifestyle, living arrangements or the expectations of caring for the elderly in rural Thailand compared to those in the other countries (Gray, Rukumnuaykit, Kittisuksathit, & Thongthai, 2008; Knodel & Chayovan, 2009).

In Thailand, especially in the rural Northeast, older persons traditionally live with their children and their family in a large household (Gray et al., 2008). They also spend a good deal of time together. For example, they gather together to eat, to watch television or to participate in leisure activities (Knodel & Chayovan, 2008, 2009; Knodel & Saengtienchai, 2007b). In more developed countries, older persons tend to live more independently (Chappell, 2003).

Furthermore, family members also play an important role in providing and managing care and assistance in everyday tasks for older members of the family (Jongudomkarn & Camfield, 2006). Traditionally, younger members of the household are expected to take responsibility for the care of the older members, including assisting with everyday activities such as bathing, dressing, doing laundry, shopping, and preparing meals. The children are also expected to assist with financial support including essential expenses and medical fees.

In addition, traditional beliefs among Thai people are strongly influenced by Buddhism as about 95% of the population are Buddhists (Ministry of Public Health of Thailand, 2010). The dominant concepts adopted from Buddha's teachings are to understand and accept the nature of all existences and to be patient when facing hard situations (Lundber & Thrakul, 2011). As a result, older Thais with visual impairment may be more accepting of the losses normally associated with the onset

of visual impairment as a part of the normal aging process than older people elsewhere.

These religious beliefs and cultural traditions continue to be practiced in Thailand, especially among those who live in the rural Northeast (Jongudomkarn & Camfield, 2006; Knodel & Chayovan, 2008, 2009). This may explain, at least in part, why older Thais do not appear to experience the same level of emotional distress, loss of independence and economic disadvantage associated with the onset of visual impairment as that usually found in other parts of the world (Bekibele & Gureje, 2008b; Brown & Barrett, 2011; Chia et al., 2003; Jin & Wong, 2008; La Grow, Alpass, et al., 2011; Lamoureux et al., 2009; Noran et al., 2009; Polack et al., 2008; Steinman & Allen, 2011; Tran et al., 2011; Vu et al., 2005; C. W. Wang et al., 2008; Wu et al., 2009; Zimdars et al., 2012).

This study found visual impairment to have an impact on QOL in terms of the sensory abilities facet of the WHOQOL-OLD only. However, it should be noted that the difference found between the groups on the sensory abilities facet of the WHOQOL-OLD is to be expected as the participants in this study were divided by their visual status, and the validity of these groups was assessed by comparing the groups on the scores from this facet.

It was predicted that the scores obtained from the QOL measures used in this study would be lower than those reported for other countries. The study was conducted among older persons living in rural areas of a developing country, where, in general, it is expected that this sample would be poorer, less well educated, and in poorer health than those reported elsewhere. This assumption was confirmed, in part, when comparing the scores from the 4 domains of the WHOQOL-BREF and the 6

facets of the WHOQOL-OLD to the scores reported for those in other countries (Hawthorne et al., 2006; WHO, 2006).

As expected, older persons in rural Thailand were found to have lower scores of the physical health (i.e. 60.72 vs. 69.87) and environment (i.e. 61.15 vs. 75.69) domains of the WHOQOL-BREF than the norms for these scores reported by Hawthorne et al. (2006). This was expected as Thailand is a developing country where health services, especially in rural areas of the country, are affected by a combination of factors such as accessibility, availability and affordability, resulting in unequal access to healthcare, low utilization of services and financial limitations (Dandona & Dandona, 2006b). In addition, living standards are not as high as in developed countries (Mitra, Posarac, & Vick, 2011). This means that people in Thailand, especially in the rural Northeast, may face poorer physical health and experience more chronic health conditions than those in developed countries. They also experience economic hardship and lack of finances which may limit their ability to maintain their health.

However, the scores obtained on the psychological (71.22 vs. 69.58) and social relationships (75.03 vs. 70.79) domains of the WHOQOL-BREF, as well as the social participation (67.50 vs. 66.07) facet of the WHOQOL-OLD, were higher than those reported elsewhere (Hawthorne et al., 2006; WHO, 2006). This is likely to be due to differences between aspects of family life in Thailand, especially in the rural Northeast, and those in more developed countries. For example, people in the more developed countries commonly live in small nuclear families while Thai families share the same housing and multi-generational homes are common. People in rural Thailand live together and support each other. They also enjoy getting together with family and friends for dinner, dancing, watching TV, and playing cards

(Jongudomkarn & Camfield, 2006; Knodel & Chayovan, 2008; Lundber & Thrakul, 2011). Older persons will generally not experience difficulty in performing their daily tasks as they are usually cared for by their children as a part of their traditional culture. They also tend not to be lonely or experience depression due to isolation as they are surrounded by their children and grandchildren. All these factors may be reflected in the higher scores found on the psychological and social relationships domains of the WHOQOL-BREF and the social participation facet of the WHOQOL-OLD for older Thais over those reported in studies conducted elsewhere (Hawthorne et al., 2006; WHO, 2006).

These factors may also account for the findings that visual impairment did not appear to have the same impact on the QOL as that reported in the earlier studies (Bekibele & Gureje, 2008b; Brown & Barrett, 2011; Chia et al., 2003; Jin & Wong, 2008; Lamoureux et al., 2009; Noran et al., 2009; Polack et al., 2008; Steinman & Allen, 2011; Tran et al., 2011; Vu et al., 2005; C. W. Wang et al., 2008; Wu et al., 2009; Zimdars et al., 2012). In fact, after controlling for age, economic status and overall perception of health, the only factor found to differ by visual status was the sensory abilities facet of the WHOQOL-OLD.

5.6 The model to predict the overall perception of QOL for older persons living in a rural area of Northeast Thailand

According to the model proposed in Chapter One, it was expected that the overall perception of QOL would vary depending on the interactions between visual status, health status, psychological factors, environment factors, and personal factors. In all, 17 variables were considered as possibly impacting on overall perception of QOL. However, eight variables (i.e. age, gender, levels of education, economic

status, health conditions, visual impairment, and the sensory abilities, and death and dying facets of the WHOQOL-OLD) were not found to be at least minimally correlated ($r \leq 0.3$) with overall perception of QOL and One variable (i.e. past present and future facet of the WHOQOL-OLD) was found to be too highly correlated with other independent variables, therefore were not entered into the equation to predict overall perception of QOL.

It is interesting that visual impairment was not found to be even minimally ($r \leq 0.3$) associated with overall perception of QOL; nor was age, gender, level of education, or economic status. This could be due to religious beliefs and cultural traditions including lifestyle and support provided by families for daily activities and finances and participation with others play a greater role in this population (Jongudomkarn & Camfield, 2006; Knodel & Chayovan, 2008, 2009).

The remaining eight variables (i.e., overall perception of health, physical health, psychological, social relationships, environment, autonomy, social participation, and intimacy) accounted for 45.6% of the variance in the scores of overall perception of QOL. This was considered to be a relatively high level of prediction (Pallant, 2007).

However, when shared variance was taken into account, only the scores from the psychological, environment and physical health domains of the WHOQOL-BREF, the intimacy facet of the WHOQOL-OLD and overall perception of health were found to make a unique contribution to this prediction.

The psychological domain assesses the extent to which respondents say they enjoy life, feel their life is meaningful, are able to concentrate, accept their bodily appearance, and satisfied with themselves, and the frequency with which negative feelings (i.e. despair, anxiety and depression) are experienced.

The environment domain assesses financial resources, freedom, physical safety and security, health and social care including accessibility and quality, physical environment and home environment, opportunities for acquiring new information and skills, participation in and opportunities for recreation/ leisure activities, and transport.

The physical health domain assesses activities of daily living, dependence on medicinal substances and medical aids, energy and fatigue, mobility, pain and discomfort, sleep and rest, and work and capacity.

The intimacy facet assesses feelings of a sense of companionship in life, experiencing love in life, having opportunities to love, and having opportunities to be loved.

Overall perception of health is examined by responses to the question “How satisfied are you with your health?”. The score was rated on a 5-point scale ranging from “very dissatisfied” (a score of 1) through to “Very satisfied” (a score of 5).

However, the psychological domain, overall perception of health, and intimacy facets were found to make the greatest contributions to the model.

Therefore, the findings of this study suggest that the model proposed to explain overall perception of QOL could be modified as illustrated in the following figure.

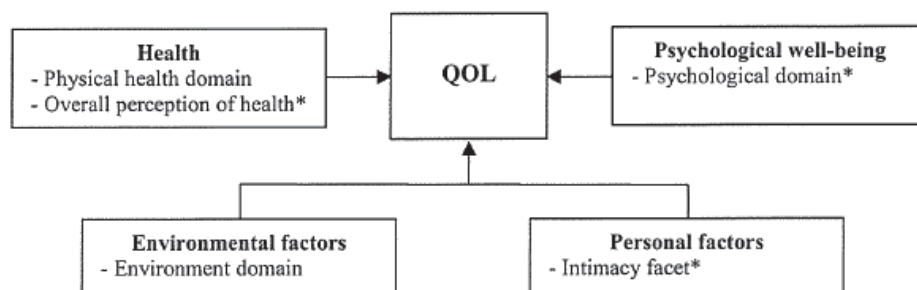


Figure 5.1: A revised model to illustrate the factors affecting QOL

5.7 Summary

The rate of assessed visual impairment found in this study was higher than that estimated for the whole country as expected as this study was conducted in Northeast region, the poorest and the most rural in the country. The higher rate of visual impairment found in this study may be due to a lack of access to eye care and a lack of services available in this area. In addition, finances may limit affordability or may be a combination of these factors (Dandona & Dandona, 2006b; Dineen et al., 2007; Wibulpolprasert et al., 2004).

The rate of self-reported visual impairment found here was 1.2 times higher than that reported by La Grow, Sudnongbua, et al., (2011) in a sample specifically selected for this purpose. However, when the validity of self-reported visual impairment was assessed in terms of sensory function, those who identified as having self-reported visual impairment but did not meet the criteria for visual impairment were not found to differ from those who reported no visual impairment. Thus the validity of self-report as a measure of visual impairment may need to be assessed.

As also expected, the prevalence of visual impairment was found to vary depending on age, economic status and overall perception of health. Those who were visually impaired were found to be older, worse off economically and in poorer health than those who were not.

Visual impairment was not found to have an impact on QOL among this population after age, economic status, and overall perception of health were controlled for. This could be due to the positive effects of support of family on daily activities, religious beliefs and practices, cultural traditions and participation with others (Jongudomkarn & Camfield, 2006; Knodel & Chayovan, 2008; Lundber & Thrakul, 2011).

This study also found that overall perception of health, physical health, psychological, social relationships, environment, autonomy, social participation, and intimacy were at least minimally correlated with overall perception of QOL, and accounted for 45.6% of the variance in the score of the overall perception of QOL among older persons living in rural Northeast, Thailand. However, only the scores from overall perception of health, the physical health, psychological, and environment domains of the WHOQOL-BREF, and the intimacy facet of the WHOQOL-OLD were found to make a unique contribution to this prediction with the psychological domain, overall perception of health, and intimacy facet making the greatest contributions.

5.8 Implications and recommendations

The findings of this study has provided useful information for the policy makers of the Ministry of Public Health of Thailand in planning for eye care and social services, especially for those who live in the rural areas of the country. The high rate of visual impairment found among older persons living in rural Northeast Thailand needs to be recognised.

The rate of assessed visual impairment found here was 1.3 times higher than that reported for the whole country (National Statistical Office of Thailand, 2002). This may reflect the fact that in rural areas, there is unequal distribution of eye care treatment and services compared to urban areas (Wibulpolprasert et al., 2004). The high prevalence found in this study could also be due to a high rate of uncorrected refractive error including presbyopia (Holden et al., 2008), as uncorrected or undercorrected refractive error is commonly found in poor and rural parts of the world (Dandona & Dandona, 2006b; Holden et al., 2008).

As people age, an increasing rate of visual impairment may inevitably result. In order to decrease the rate of visual impairment, the government should consider establishing programmes to prevent and control visual impairment by integrating eye care services with primary and secondary healthcare. For example, there should be programmes to provide eye treatment at an affordable cost for those with treatable or preventable conditions such as cataract, glaucoma and refractive errors.

Also, the government should implement campaigns to raise awareness or provide screening for early detection of eye conditions, in order to prevent and eliminate treatable visual impairment, especially for the people who live in the remote rural areas. About 80% of all visual impairments in the world are preventable and treatable (WHO, 2011).

In addition, the government should increase the number of physicians, nurses and other health support workers working in rural areas of the country. This would mean that healthcare and treatment is available and would increase the rate of access to healthcare among people in this area.

As low income and poor health are the main factors impacting on the rate of visual impairment among older persons, the government should provide low cost cataract surgery or free glasses to those with low-income. This would eliminate financial limitations as a barrier to accessing eye care among this population. In addition, expansion of existing health facilities and provision of transportation or mobile health services at home can also improve access to healthcare including eye services for those who live in rural areas.

As it was found that physical health, psychological well-being, environment, overall perception of health, and intimacy are of particular importance for predicting QOL in this population, the government should provide healthcare services in the

community, increase sanitation facilities and improve basic living conditions in order to improve physical health and environment and to increase QOL for the population as a whole. This would not only benefit older persons but also improve the QOL of all people, as it is one of the main purposes of health and social policy in Thailand (Ministry of Public Health of Thailand, 2008). Simultaneously, traditional care and support from the family, spouse, and younger generations should be encouraged in order to maintain psychological well-being, social relationships, and intimacy among Thai older people.

In summary, it is suggested that improving the healthcare system by increasing accessibility, quality of care, healthcare facilities and affordability through provision of free medical and health services to low-income groups and older persons may help to decrease the high rate of visual impairment in Thailand. Improving their health, environment, psychological well-being and intimacy may help to improve QOL of the population as a whole. In addition, improving physical environment, and raising living standards may also help to increase QOL for all people in the country.

Visual impairment was not found to have the overwhelmingly negative impact on QOL as found elsewhere. Other countries may learn from this study that adopting the culture of support from the family and participating in social life as in Thailand may be a way to lessen the negative impact of visual impairment on QOL.

Living alone or in aged care institutions may cause stress or depression among older persons from social isolation or family abandonment. It has been found that the risk of depression in the elderly increases from 5% for those living in the community to 13.5% for those living in aged care institutions (Hybels & Blazer,

2003). It could be better if older persons in developed countries continued living at home with their children rather than living alone or in institutions.

In extended household living, family members can support and care for their older parents, performing everyday activities for them including helping them out of bed, showering, dressing, cleaning, meal preparing, and shopping. Furthermore, social and emotional support can also be provided by the family, for example confiding, comforting, reassuring, and listening to problems. Equally, the older parents may also provide care for others in the family, for example casual baby-sitting or even fulltime day care. This may help to maintain physical and psychological health, as well as social participation, among older persons.

Therefore, it should be recommended to policy makers in developed countries that they should encourage the care of the elderly in their own home by their family. In addition, they should raise awareness of the family roles and patterns of interactions between older parents and the younger generation, as exchanges of support between family members may benefit all.

These governments should also establish programmes that would address the importance of the role of family care and support, as well as highlighting the needs of the family and the needs of the dependent elderly person, enabling family members to care for each other. These governments may also consider offering financial support or a tax reduction for those who care for older parents.

Support between the family members may help to strengthen family bonds. Moreover, the role of older persons in keeping wider sets of relatives connected with each other may bring families closer together. Support of the elderly by family members is probably the most important element for health and well-being, contributing to the quality of life among older persons (Good, 2005). Additionally,

support and assistance from family, friends and relatives may also help to remove the negative impact of visual impairment on their QOL.

5.9 Limitations

The limitations of this study are that it did not seek to identify the causes or degree of visual impairment, or assess the rate of uncorrected or undercorrected refractive error including presbyopia, or explore availability of treatment or the barriers to access for vision and eye care. Nor did this study conduct an in-depth investigation of the factors which affected QOL in this population. However, there is no evidence to suggest that these limitations would have a marked effect on the results or change the overall conclusions of this study.

Further study is required to examine the causes of visual impairment resulting in visual disability in this region, including the prevalence of uncorrected or undercorrected refractive error, as well as the availability of treatment and barriers to accessing eye care for those who live in rural areas of the country. Additional research to assess the validity of self-reported visual impairment as a measure of visual impairment may also be needed as the validity of this measure was not upheld in this study when using sensory abilities as the validity criteria.

In addition, the impact of the factors affecting QOL among older persons living in remote, rural areas needs to be comprehensively examined using a more qualitative approach.

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Appendix A: Ethics approval

Ethics approval

Massey University Human Ethics Committee: Southern A



Massey University

8 September 2009

Ms Phatcha Hirunwatthanakul
c/- School of Health & Social Services
PN371

OFFICE OF THE ASSISTANT
TO THE VICE-CHANCELLOR
(RESEARCH ETHICS)
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Dear Phatcha

Re: HEC: Southern A Application – 09/54
The impact of visual impairment on quality of life among older persons in a rural area of North Eastern Thailand

Thank you for your letter dated 3 September 2009.

On behalf of the Massey University Human Ethics Committee: Southern A, I am pleased to advise you that the ethics of your application are now approved. Approval is for three years. If this project has not been completed within three years from the date of this letter, reapproval must be requested.

Please note that travel undertaken by students must be approved by the supervisor and the relevant Pro Vice-Chancellor and be in accordance with the Policy and Procedures for Course-Related Student Travel Overseas. In addition, the supervisor must advise the University's Insurance Officer.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely

Professor Julie Boddy, Chair
Massey University Human Ethics Committee: Southern A

cc Prof Steve La Grow
School of Health & Social Services
PN371

Prof Warwick Slinn, HoS
School of Health & Social Services
PN371

**The letter requesting permission to conduct the study in
Maha Sarakham Province**



Massey University
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July 23, 2009

Mahasarakham Provincial Public Health Office
 Maha Sarakham Province
 Amphoe Muang
 Maha Sarakham Province
 Thailand 44000

Dear Sir

I am currently a doctoral student at Massey University, New Zealand. I am going to conduct the research project on the impact of visual impairment on quality of life among older persons in a rural area of North Eastern Thailand. The project will be carried out in Maha Sarakham province. The sample for this study will be drawn from persons 60 years and older living in Maha Sarakham Province. Therefore, I would like to ask for permission for using the HCIS database of Maha Sarakham population.

I expect that the information obtained from my research would be beneficial to Maha Sarakham Provincial Public Health Office. It is expected to study the incidence and prevalence of visual impairment among older persons in a this area and the impact it has on their quality of life, as well as, to identify the amount of untreated and undiagnosed vision impairment in this population. These findings may be of use in understanding both the size and degree of the problem which visual impairment may present to this demographic and even with regard to provide information concerning support and services for visually impaired people in Thailand. If you need more information or any additional question, please feel free to contact me at the address below.

I would like to thank you for your consideration and permission.

Yours sincerely,

(Phatcha Hirunwatthanakul)
 Doctoral student

(Prof. Steve La Grow)
 Supervisor

School of Health Sciences,
 Massey University Private Bag 11222,
 Palmerston North, New Zealand
 Telephone: 64 6 3505799 Ext 2038

Information sheet

(English)

The impact of visual impairment on quality of life among older persons in a rural area of Northeast Thailand.

Researcher(s) Introduction

My name is Phatcha Hirunwatthanakul. I am currently a doctoral student of School of Health Sciences, Massey University, New Zealand under supervision of Professor Steve La Grow. I am carrying out a survey research project to study the prevalence of visual impairment among elderly people in a rural area of North Eastern Thailand, identify the impact of visual impairment on their quality of life, as well as, determine the factors which affect their global quality of life.

Project Description and Invitation

Visual impairment and Blindness remain major public health problems in many countries of the world. Global estimates of visual impairment by WHO illustrate that more than 90% of the world's visually impaired population live in developing countries and the highest proportion of those live in the region of South East Asia. Since there is insufficient information about visual impairment and there are very few studies which have examined the impact of visual impairment on older persons living in a rural area of Thailand, these findings may be of use in understanding both the size and degree of the problem which visual impairment may present to this demographic. The purpose of this study, therefore, is to determine the incidence and prevalence of visual impairment among older persons in a rural area of North Eastern Thailand and the impact it has on their quality of life, as well as, to identify the amount of untreated and undiagnosed vision impairment in this population. The study will be conducted in Maha Sarakham province, a rural area in North Eastern Thailand. The study is limited to people aged 60 years and older and residing in rural areas of Maha Sarakham Province. The director of Maha Sarakham Health Office will be informed about the nature of the study and asked for HCIS database. However, you have a right to participate or not participate in the study. Declining to participate will not affect their life in any way. There is no expectation of any harm to you. If you are willing to participate, I will arrange for you to sign the consent form.

Participant Identification and Recruitment

A population-based survey will be used in this study. Five hundred participants for this study will be randomly drawn from all people over 60 years old registered and residing in non municipal areas of Maha Sarakham province. The participants will be selected using a multistage stratified area probability sampling of individuals. The sampling stage consists of local government areas: districts as first units, sub

district as secondary sampling units, and then individual as the final sampling units. The questionnaire for this study will cover information concerning demographics, health problems and quality of life. All participants will be asked to respond to the demographic portion of the questionnaire and complete the Thai versions of the World Health Organization Quality of Life BREF (WHOQOL-BREF), and a Thai translation of the World Health Organization Quality of Life-OLD (WHOQOL-OLD). There is no expectation of any harm or risk to the participants as a result of participation. They will be informed about their right not to answer any question and to withdraw from participation at any time they wish as well.

Project Procedures

The questionnaires for this study are all standard questionnaires; Thai versions of the WHO Quality of Life BREF (WHOQOL-BREF), and a Thai translation of the WHO Quality of Life-OLD (WHOQOL-OLD). The researcher will spend about 15-20 minutes for interviewing. All participants will be visited in their homes and data will be collected. Consent form will be obtained from all participants after informing them that all information will be kept confidential and used only for this project.

Data Management

All information will be coded for data analysis. The information will then be analyzed and written as my doctoral thesis, as well as it will be published in related journals. The summary of the study results will be sent to the Maha Sarakham Official Health Office. The participants' information and coding of data will be kept confidentially by the researcher in a locked filing cabinet at Boromarachajonnanee College of Nursing, Nakhon Phanom for 10 years after the completion of the study and then destroyed.

Participant's Rights

You are under no obligation to accept this invitation. If you decide to participate, you have the right to:

- decline to answer any particular question;
- withdraw from the study any time of the interview;
- ask any questions about the study at any time during participation;
- provide information on the understanding that your name will not be used unless you give permission to the researcher;
- be given access to a summary of the project findings when it is concluded.

Project Contacts

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher named Phatcha Hirunwatthanakul is responsible for the ethical conduct of this research. The research does not include the "**Compensation for Injury**" statement unless you are aware of circumstances which might make it appropriate. If in doubt, discuss with the Chair of a Human Ethics Committee. If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher, please contact as follows:

1. Professor Sylvia Rumball,
Assistant to the Vice-Chancellor (Research Ethics),
Telephone 06 350 5249, email humanethics@massey.ac.nz.
2. Professor Julie Boddy,
Chair, Massey University Human Ethics Committee Southern A,
Telephone: 06 350 5799 Ext 2541, email humanethicsoutha@massey.ac.nz.
3. The researcher: Phatcha Hirunwatthanakul

New Zealand: School of Health Sciences,
Massey University Private Bag 11222,
Palmerston North, New Zealand
Telephone: 64 6 3505799 Ext 2038

Thailand: Boromarachajonnanee College of Nursing, Nakhon Phanom,
Nakhon Phanom University, Thailand, 48000
Telephone: 66 8 1669 8980,
Email address: hphatcha@hotmail.com

4. Supervisor: Professor Steve La Grow
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Information sheet

(Thai translation)



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โครงการศึกษาผลกระทบของความบกพร่องทางสายตาต่อคุณภาพชีวิตของผู้สูงอายุที่อาศัยอยู่ในชนบท

ภาคตะวันออกเฉียงเหนือ ประเทศไทย

คำนำ

ผู้วิจัย ชื่อ นางสาวพัชรา หิรัญวัฒน์กุล นักศึกษาปริญญาเอก สาขา วิทยาศาสตร์สุขภาพ มหาวิทยาลัย Massey University ประเทศนิวซีแลนด์ โดยมี ศาสตราจารย์ สตีฟ ลา โกรว์ (Professor Steve La Grow) เป็นอาจารย์ที่ปรึกษา ผู้วิจัยมีความสนใจเป็นอย่างยิ่งที่จะศึกษาจำนวนผู้มีความบกพร่องทางสายตา ในผู้สูงอายุไทยที่อาศัยอยู่ในชนบทภาคตะวันออกเฉียงเหนือ และศึกษาผลกระทบของความบกพร่องทางสายตา ต่อคุณภาพชีวิต และปัจจัยที่มีผลต่อระดับคุณภาพชีวิต รวมถึงจำนวนของผู้สูงอายุที่ปัญหาทางด้านความบกพร่องทางสายตาที่ไม่ได้รับการตรวจวัดสายตาและการรักษา ในกลุ่มผู้สูงอายุเหล่านี้ ผู้วิจัยจึงใคร่ขอเชิญชวนท่านเข้าร่วมในการศึกษาค้นคว้าครั้งนี้ซึ่งเป็นการศึกษาเพื่อให้ทราบถึงจำนวนของผู้ที่มีความบกพร่องทางสายตาของผู้สูงอายุ และผลกระทบของภาวะความบกพร่องทางสายตาที่มีผลต่อการดำเนินชีวิต โดยผลการศึกษาค้นคว้าจะเป็นประโยชน์ในการอนุมานจำนวนของผู้ที่มีความบกพร่องทางสายตา ในผู้สูงอายุชาวไทย และผลกระทบของความบกพร่องของสายตาที่มีต่อคุณภาพชีวิต ของผู้สูงอายุชาวไทยในชนบท ภาคตะวันออกเฉียงเหนือ ประโยชน์ของโครงการนี้เพื่อนำไปใช้เป็นข้อมูลในการวางแผน และนโยบาย สำหรับพัฒนาและส่งเสริม การบริการแก่ผู้มีความบกพร่องทางสายตาในการบริการด้านสาธารณสุขในลำดับต่อไป

บทนำ

คนตาบอดและผู้มีความบกพร่องทางสายตายังคงเป็นปัญหาสุขภาพสำหรับหลายประเทศทั่วโลก องค์การอนามัยโลก คาดว่า จำนวน 90 เปอร์เซ็นต์ ของผู้ที่มีความบกพร่องทางสายตาอาศัยอยู่ในประเทศที่กำลังพัฒนา โดยเฉพาะประเทศในภูมิภาคเอเชียตะวันออกเฉียงใต้ ประเทศเหล่านี้ยังประสบปัญหา ไม่ทราบจำนวนที่แน่นอนของผู้ที่มีความบกพร่องทางสายตา เพราะมีผู้ทำการศึกษาวิจัยในหัวข้อนี้น้อย ทำให้ไม่มีข้อมูลเพียงพอสำหรับการวางแผนในการให้บริการทางสาธารณสุข ดังนั้นโครงการนี้จะเป็นประโยชน์เพื่อให้ทราบถึงจำนวนของผู้ที่มีความบกพร่องของสายตา โดยเฉพาะผู้สูงอายุที่อาศัยอยู่ในชนบท ซึ่งเป็นผู้ที่อาจจะเข้าไม่ถึงระบบบริการของรัฐ โดยโครงการนี้จะทำการศึกษาวิจัยในจังหวัดมหาสารคาม ผู้ที่สามารถเข้าร่วมโครงการจะเป็นผู้สูงอายุชาวไทย อายุตั้งแต่ 60 ปี ขึ้นไป อาศัยอยู่ในเขตชนบทของจังหวัดมหาสารคาม

การเข้าร่วมโครงการ

โครงการนี้จะทำการศึกษาวิจัยในจังหวัดมหาสารคาม ต้องการผู้เข้าร่วมโครงการจำนวน 500 คน โดยกลุ่มตัวอย่างจำนวน 500 คนนี้ จะถูกสุ่มตัวอย่าง มาจากผู้สูงอายุชาวไทย อายุตั้งแต่ 60 ปี ขึ้นไป ที่อาศัยอยู่ในเขตชนบทของจังหวัดมหาสารคามทั้งหมด การดำเนินโครงการขั้นแรก ผู้วิจัยจะชี้แจงโครงการต่อนายแพทย์สาธารณสุขจังหวัด มหาสารคามก่อน หลังจากนั้นนายแพทย์สาธารณสุขจังหวัด เห็นชอบโครงการ ผู้วิจัยจะต้องขออนุญาตใช้ฐานข้อมูล HCIS ของจังหวัด เพื่อใช้ในการสุ่มตัวอย่าง หลังจากนั้นจะทำการสุ่มตัวอย่างเพื่อให้ได้รายชื่อผู้ที่เข้าร่วมโครงการ จำนวน 500 คน และจะทำการเก็บข้อมูล อย่างไรก็ตาม ถึงแม้ว่าท่านจะถูกสุ่มชื่อ เพื่อเข้าร่วมโครงการ หากท่านไม่ต้องการเข้าร่วมโครงการ หรือไม่เต็มใจเข้าร่วมโครงการ ท่านสามารถปฏิเสธที่จะเข้าร่วมโครงการได้ โดยไม่ได้รับผลกระทบใดใด หากท่านยินดีที่จะเข้าร่วมโครงการ ผู้วิจัยจะทำการขออนุญาตจากท่านและให้ท่านลงนามยินยอมเข้าร่วมโครงการก่อน หลังจากนั้น ท่านจะต้องตอบแบบสอบถาม สำหรับข้อมูลทั่วไป และข้อมูลคุณภาพชีวิต โดยโครงการนี้จะใช้ แบบสอบถามของ WHO: WHOQOL และ WHOQOL-OLD

วิธีการวิจัยกับผู้เข้าร่วมโครงการ

ผู้เข้าร่วมโครงการนี้จะต้องตอบแบบสอบถามของ WHO: WHOQOL และ WHOQOL-OLD สำหรับท่านที่บอกรว่ามีปัญหาเกี่ยวกับสายตา ในการดำเนินชีวิตประจำวัน จะต้องตอบแบบสอบถาม IVI เพิ่ม เพื่อเป็นการคัดกรอง และวินิจฉัยเบื้องต้นว่า ท่านเป็นผู้มีปัญหาด้านความพร่องทางสายตา ในการตอบแบบสอบถามจะใช้เวลาทั้งหมด 15-20 นาที การเก็บข้อมูล ผู้วิจัยจะเป็นผู้เก็บข้อมูลของท่านที่บ้าน ผู้วิจัยจะอำนวยความสะดวกแก่ท่านโดยเลือกเวลาที่ท่านสะดวกและในสถานที่เหมาะสม แต่ทั้งนี้ต้องได้รับความยินยอมและอนุญาตจากท่านเป็นสำคัญ และในระหว่างดำเนินการสัมภาษณ์ท่านสามารถปฏิเสธการตอบคำถามได้ทุกขณะ ภายหลังจากเก็บรวบรวมข้อมูลเสร็จเรียบร้อย ผู้วิจัยจะเป็นผู้วิเคราะห์ข้อมูล นำไปเขียนวิทยานิพนธ์ฉบับสมบูรณ์ และตีพิมพ์ในวารสารวิจัยต่อไป ผลการศึกษาในครั้งนี้ ผู้วิจัยจะส่งสรุปผลมายังนายแพทย์สาธารณสุขจังหวัดมหาสารคาม ส่วนข้อมูลจากการสัมภาษณ์และแบบสอบถาม ผู้วิจัยจะเก็บรักษาไว้นาน 10 ปี ภายหลังจากเขียนวิทยานิพนธ์ฉบับสมบูรณ์ แล้วจึงทำลาย

สิทธิของผู้เข้าร่วมการวิจัย

เมื่อท่านเข้าร่วมการวิจัยครั้งนี้ โดยความสมัครใจของท่านเอง ท่านจะมีสิทธิดังนี้

- ไม่ตอบคำถามที่ท่านไม่ต้องการตอบ
- ขอยุติการเข้าร่วมการศึกษาครั้งนี้ จนถึงเวลาในการสัมภาษณ์เสร็จสิ้นสมบูรณ์
- สอบถามข้อสงสัยเกี่ยวกับการวิจัยครั้งนี้ ได้ตลอดเวลา
- ไม่เปิดเผยชื่อของท่านไม่ว่ากรณีใดๆ ก็ตาม โดยที่ข้อมูลของท่านจะถูกเก็บเป็นความลับ ซึ่งจะใช้อักษรย่อแทนชื่อสกุล ของท่านในการบันทึกข้อมูล หรือในกรณีที่เปิดเผย ผู้วิจัยต้องได้รับอนุญาตจากท่านเป็นลายลักษณ์อักษร
- ท่านมีสิทธิ์รับทราบผลการวิจัยครั้งนี้ ภายหลังจากวิเคราะห์ข้อมูลเรียบร้อยแล้ว

การติดต่อผู้เกี่ยวข้องกับกรวิจัย

โครงการวิจัยฉบับนี้ ได้ผ่านการพิจารณาและตรวจสอบจากคณะกรรมการพิจารณาจริยธรรมการศึกษาในคนของ Massey University ประเทศ New Zealand เลขที่ ___/___ หากท่านมีข้อสงสัยประการใด กรุณาติดต่อบุคคลหรือองค์กรที่เกี่ยวข้อง ดังนี้

1. คณะกรรมการพิจารณาจริยธรรมการศึกษาในคนของ Massey University Human Ethics Committee:

Professor Julie Boddy,

Chair, Massey University Human Ethics Committee Southern A,

Telephone: 06 350 5799 Ext 2541, email humanethicsoutha@massey.ac.nz.

2. ผู้วิจัย: นางสาวพัชชา หิรัญวัฒน์กุล

ประเทศ New Zealand: School of Health Sciences,

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Telephone: 64 6 3505799 Ext 2038

ประเทศไทย: วิทยาลัยพยาบาลบรมราชชนนี นครพนม

มหาวิทยาลัยนครพนม อ. เมือง จ. นครพนม 48000

โทรศัพท์ : 66 8 1669 8980, อีเมลล์: hphatcha@hotmail.com

3. อาจารย์ที่ปรึกษา: Professor Steve La Grow

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Telephone: 64 6 3505799 Ext 2248

Email Address: S.J.LaGrow@massey.ac.nz

Participant consent form

(English)



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COLLEGE OF HUMANITIES AND SOCIAL SCIENCES
Te Kura Pūkenga Tangata

SCHOOL OF HEALTH AND
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Private Bag 11 222
Palmerston North 4442
New Zealand
T 64 6 356 9099 extn 2822
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**The impact of visual impairment on quality of life among older persons in a rural area
of North Eastern Thailand.**

PARTICIPANT CONSENT FORM

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I agree/do not agree to be interviewed.

I agree to participate in this study under the conditions set out in the Information Sheet.

Signature: **Date:**

Full Name - printed

Participant consent form

(Thai translation)



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แบบฟอร์มใบยินยอมเข้าร่วมโครงการศึกษาผลกระทบของความบกพร่องทางสายตาต่อคุณภาพชีวิตของ
ผู้สูงอายุที่อาศัยอยู่ในชนบท ภาคตะวันออกเฉียงเหนือ ประเทศไทย

ข้าพเจ้า(นาย ,นาง ,นาง).....นามสกุล.....อายุ.....
ปี ที่อยู่ อำเภอ.....จังหวัดมหาสารคาม ได้อ่านคำชี้แจงเชิญชวนเข้าร่วมการวิจัยของนางสาวพัชรา นิรัญวัฒนกุล
ผู้ทำการศึกษาวิจัยเกี่ยวกับผลกระทบของความบกพร่องทางสายตาต่อคุณภาพชีวิตของผู้สูงอายุ ที่อาศัยอยู่ในชนบท
ภาคตะวันออกเฉียงเหนือ ประเทศไทย โดยเนื้อความประกอบไปด้วย ลักษณะการดำเนินการวิจัย วัตถุประสงค์และแนว
ปฏิบัติสำหรับข้าพเจ้า ในฐานะผู้เข้าร่วมโครงการ วิจัยนี้ พร้อมทั้งผู้ทำการวิจัยยังได้อธิบายรายละเอียดเกี่ยวกับสิทธิของ
ข้าพเจ้าในการเข้าร่วมวิจัยในครั้งนี้ ซึ่งข้าพเจ้ามีความเข้าใจอันดีในสิทธิที่ข้าพเจ้าสามารถถอนตัวจากการศึกษานี้เมื่อใด
ก็ได้ตามที่ข้าพเจ้าปรารถนา ข้าพเจ้าได้อ่านและเข้าใจตามคำอธิบายข้างต้นแล้วจึงได้ลงนามยินยอมให้ทำการศึกษา

ลงชื่อผู้ร่วมโครงการ

(.....)

วันที่...../...../.....

ลงชื่อพยาน

(.....)

วันที่...../...../.....

Permission from

Maha Sarakham Provincial Public Health Office



Maharakham Provincial Public Health Office
Maha Sarakham Province
Amphoe Muang
Maha Sarakham Province
Thailand 44000

August 25, 2009

Dear Miss Phatcha

According to your letter requesting for permission of using the HCIS database of Maha Sarakham population in your research project. You are very welcome to give the permission for using this database and I am happy that you are going to carry out the research project on the impact of visual impairment on quality of life among older persons in a rural area of North Eastern Thailand in Maha Sarakham province.

I also expect that the research would be beneficial to Maha Sarakham Provincial Public Health Office with regard to provide supports and services for visually impaired people. If you need more information or any additional question, please feel free to contact me.
I am looking forward to seeing you soon.

Regards,



(Dr. Suriya Rattanaparinya)
Director of Maharakham Provincial Public Health Office

Appendix B: Questionnaire

Questionnaire (English)

QN.....

**The impact of visual impairment on quality of life among older
persons in a rural area of
North Eastern Thailand.**

Part A: General Information

Please answer the questions about yourself: by circling the best correct answer for you or by filling in the space provided.

Office Use Only

1. What is your gender?

A 1

1. Male 2. Female

A 2.....

2. How old are you? _____ Years

3. What is your marital status?

A 3

1. Married 2. Separated 3. Divorced
4. Widowed 5. Never Married

4. What is the highest education you completed?

A 4

1. None at all 2. Primary school 3. Secondary school
4. Tertiary 5. College (Diploma) 6. University (Degree)

5. Do you have long term health conditions or chronic illness?

A 5

Yes	No
1	2...Go to question 7

6. Which long-term health conditions or chronic illness do you have?

You can tick more than one

6a. Physical Disability	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6a	<input type="checkbox"/>
6b. Rheumatoid arthritis	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6b	<input type="checkbox"/>
6c. Chronic respiratory diseases: asthma	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6c	<input type="checkbox"/>
6d. Chronic renal failure	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6d	<input type="checkbox"/>
6e. Diabetes	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6e	<input type="checkbox"/>
6f. Chronic hepatitis	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6f	<input type="checkbox"/>
6g. Cardiovascular diseases: heart failure	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6g	<input type="checkbox"/>
6h. Hypertension or high blood pressure	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6h	<input type="checkbox"/>
6i. Hepatitis	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6i	<input type="checkbox"/>
6j. Osteoporosis	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6j	<input type="checkbox"/>
6k. Cancer	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6k	<input type="checkbox"/>
6l. Stroke	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6l	<input type="checkbox"/>
6m. Epilepsy	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6m	<input type="checkbox"/>
6n. Other (please specify).....	<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No	6n	<input type="checkbox"/>

Part B: Economic Information

7. What is your employment status?

B 7

- | | | |
|----------------------|---------------------|------------------------|
| 1. No occupation | 2. Labour | 3. Agricultural career |
| 4. Commercial career | 5. Contracting hire | 6. Retired |
| 7. Other..... | | |

8. How much income do you get/receive per month?.....Baht

B 8

9. How much economic hardship do you have?

B 9

None at all	Not much	Moderate	Very much	Extreme
1	2	3	4	5

Part C: WHOQOL-BREF

This assessment asks how you feel about your quality of life, health, or other areas of your life. Please answer all the questions. If you are unsure about which response to give to a question, please choose the one that appears most appropriate. This can often be your first response. Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life in the last two weeks. For example, thinking about the last two weeks, a question might ask:

1. How would you rate your quality of life?

QOL 1

Very poor	Poor	Neither poor nor good	Good	Very good
1	2	3	4	5

2. How satisfied are you with your health?

QOL 2

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
1	2	3	4	5

3. To what extent do you feel that physical pain prevents you from doing what you need to do? QOL 3

Not at all	Not much	Moderately	Very much	Extremely
1	2	3	4	5

4. How much do you need any medical treatment to function in your daily life? QOL 4

Not at all	Not much	Moderately	Very much	Extremely
1	2	3	4	5

5. How much do you enjoy life? QOL 5

Not at all	Not much	Moderately	Very much	Extremely
1	2	3	4	5

6. To what extent do you feel your life to be meaningful? QOL 6

Not at all	Not much	Moderately	Very much	Extremely
1	2	3	4	5

7. How well are you able to concentrate? QOL 7

Not at all	Not much	Moderately	Very much	Extremely
1	2	3	4	5

8. How safe do you feel in your daily life? QOL 8

Not at all	Not much	Moderately	Very much	Extremely
1	2	3	4	5

9. How healthy is your physical environment?

QOL 9

Not at all	Not much	Moderately	Very much	Extremely
1	2	3	4	5

10. Do you have enough energy for everyday life?

QOL 10

Not at all	Not much	Moderately	Very much	Completely
1	2	3	4	5

11. Are you able to accept your bodily appearance?

QOL 11

Not at all	Not much	Moderately	Very much	Completely
1	2	3	4	5

12. Have you enough money to meet your needs?

QOL 12

Not at all	Not much	Moderately	Very much	Completely
1	2	3	4	5

13. How available to you is the information that you need in your day-to-day life?

QOL 13

Not at all	Not much	Moderately	Very much	Completely
1	2	3	4	5

14. To what extent do you have the opportunity for leisure activities?

QOL 14

Not at all	Not much	Moderately	Very much	Completely
1	2	3	4	5

15. How well are you able to get around?

QOL 15

Very poor	Poor	Neither poor nor good	Good	Very good
1	2	3	4	5

16. How satisfied are you with your sleep?

QOL 16

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
1	2	3	4	5

17. How satisfied are you with your ability to perform your daily living activities?

QOL 17

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
1	2	3	4	5

18. How satisfied are you with your capacity for work?

QOL 18

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
1	2	3	4	5

19. How satisfied are you with yourself?

QOL 19

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
1	2	3	4	5

20. How satisfied are you with your personal relationships?

QOL 20

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
1	2	3	4	5

21. How satisfied are you with your sex life?

QOL 21

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
1	2	3	4	5

22. How satisfied are you with the support you get from your friends? QOL 22

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
1	2	3	4	5

23. How satisfied are you with the conditions of your living place? QOL 23

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
1	2	3	4	5

24. How satisfied are you with your access to health services? QOL 24

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
1	2	3	4	5

25. How satisfied are you with your transport? QOL 25

Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very Satisfied
1	2	3	4	5

26. How often do you have negative feelings such as blue, mood, despair, anxiety, and depression? QOL 26

Never	Seldom	Quite often	Very often	Always
1	2	3	4	5

Part D: WHOQOL-OLD

The following questions ask about **how much you have experienced certain things** in the last two weeks. Please answer all the questions. For example, freedom of choice and feeling of control in your life, if you have experienced these things an extreme amount, please choose the number next from extreme amount. If you have not experienced these things at all, please choose the number next from not at all. We ask that you think about your life in the last two weeks.

1. To what extent do impairments to your senses (e.g. hearing, vision, taste, smell, touch) affect your daily life? OLD 1

Not at all	Not much	Moderately	Very much	Extreme amount
1	2	3	4	5

2. To what extent does loss of, for example, hearing, vision, taste, smell, or touch affect your ability to participate in activities? OLD 2

Not at all	Not much	Moderately	Very much	Extreme amount
1	2	3	4	5

3. How much freedom do you have to make your own decisions? OLD 3

Not at all	Not much	Moderately	Very much	Extreme amount
1	2	3	4	5

4. To what extent do you feel in control of your future?

OLD 4

Not at all	Not much	Moderately	Very much	Extreme amount
1	2	3	4	5

5. How much do you feel that the people around you are respectful of your freedom?

OLD 5

Not at all	Not much	Moderately	Very much	Extreme amount
1	2	3	4	5

6. How concerned are you about the way in which you will die?

OLD 6

Not at all	Not much	Moderately	Very much	Extreme amount
1	2	3	4	5

7. How much are you afraid of not being able to control your death? OLD 7

Not at all	Not much	Moderately	A great deal	Completely
1	2	3	4	5

8. How scared are you of dying?

OLD 8

Not at all	Not much	Moderately	A great deal	Completely
1	2	3	4	5

9. How much do you fear being in pain before you die?

OLD 9

Not at all	Not much	Moderately	A great deal	Completely
1	2	3	4	5

The following questions ask about **how completely you have experienced or were able to do certain things** in the last two weeks. Please answer all the questions. For example, getting out as much as you would like to do, if you have experienced these things completely, please choose the number next from completely. If you have not experienced these things at all, please choose the number next from not at all. We ask that you think about your life in the last two weeks.

10. To what extent do problems with your sensory functioning (e.g. hearing, vision, taste, smell, touch) affect your ability to interact with others?

OLD 10

Not at all	Not much	Moderately	A great deal	Completely
1	2	3	4	5

11. To what extent are you able to do the things you would like to do?

OLD 11

Not at all	Not much	Moderately	A great deal	Completely
1	2	3	4	5

12. To what extent are you satisfied with your opportunities to continue achieving in life? OLD 12

Not at all	Not much	Moderately	A great deal	Completely
1	2	3	4	5

13. How much do you feel that you have received the recognition you deserve in life? OLD 13

Not at all	Not much	Moderately	A great deal	Completely
1	2	3	4	5

14. To what extent do you feel that you have enough to do each day? OLD 14

Not at all	Not much	Moderately	A great deal	Completely
1	2	3	4	5

The following questions ask about **how satisfied, happy or good you have felt about various aspects of your life** over the last two weeks. Please answer all the questions. For example, your participation in community life or your achievement in life, decide how satisfied or dissatisfied you are and choose the number that best fits you.

15. How satisfied are you with what you have achieved in life? OLD 15

Very dissatisfied	Dissatisfied	Neither satisfied nor satisfied	Satisfied	Very satisfied
1	2	3	4	5

16. How satisfied are you with the way you use your time?

OLD 16

Very dissatisfied	Dissatisfied	Neither satisfied nor satisfied	Satisfied	Very satisfied
1	2	3	4	5

17. How satisfied are you with your level of activity?

OLD 17

Very dissatisfied	Dissatisfied	Neither satisfied nor satisfied	Satisfied	Very satisfied
1	2	3	4	5

18. How satisfied are you with your opportunity to participate in community activities?

OLD 18

Very dissatisfied	Dissatisfied	Neither satisfied nor satisfied	Satisfied	Very satisfied
1	2	3	4	5

19. How happy are you with the things you are able to look forward to?

OLD 19

Very unhappy	Unhappy	Neither happy nor unhappy	Happy	Very happy
1	2	3	4	5

20. How would you rate your sensory functioning (e.g. hearing, vision, taste, smell, touch)?

OLD 20

Very poor	Poor	Neither poor nor good	Good	Very good
1	2	3	4	5

The following questions refer to any **intimate relationships** that you may have. Please consider these questions with reference to a close partner or other close person with whom you can share intimacy more than with any other person in your life.

21. To what extent do you feel a sense of companionship in your life? OLD 21

Not at all	Not much	Moderately	Very much	Extreme amount
1	2	3	4	5

22. To what extent do you experience love in you life OLD 22

Not at all	Not much	Moderately	Very much	Extreme amount
1	2	3	4	5

OLD 23

23. To what extent do you have opportunities to love?

Not at all	Not much	Moderately	Very much	Extreme amount
1	2	3	4	5

OLD 24

24. To what extent do you have opportunities to be loved?

Not at all	Not much	Moderately	Very much	Extreme amount
1	2	3	4	5

Part E: Vision problems

25. Do you have difficulty with seeing to the degree that it interferes with your daily life? VIS 25

Yes	No
1	2...Stop interview

Part F: Visual acuity and visual field

26. Visual acuity measurement

- a. Right eye.....
- b. Left eye.....

1. Is visual acuity worse than 6/18 in better eye? VA

Yes	No
1	2....Check field of vision

Field of vision.....

2. Is visual field test equal to or less than 30 degrees? VF

Yes	No
1	2

Thank you very much for your time and your help

Questionnaire (Thai translation)

เลขที่.....

โครงการศึกษาผลกระทบของความบกพร่องทางสายตาต่อคุณภาพชีวิตของผู้สูงอายุที่อาศัยอยู่ในชนบทภาคตะวันออกเฉียงเหนือของประเทศไทย

ภาค A: ข้อมูลทั่วไปและสถานะภาพทางเศรษฐกิจ

สำหรับเจ้าหน้าที่

คำถามต่อไปนี้จะถาม เกี่ยวกับข้อมูลทั่วไปของคุณ กรุณาเลือกคำตอบที่ถูกต้องที่สุดสำหรับคุณ หรือกรอกข้อมูลในช่องว่าง

1. เพศ

A 1

1. ชาย 2. หญิง

A 2.....

2. อายุ.....ปี

3. สถานะภาพสมรส

A 3

1. สมรส 2. แยกกันอยู่ 3. หย่า

4. ม่าย 5. โสด

A 4

4. ระดับการศึกษา

1. ไม่ได้เรียนหนังสือ 2. ประถมศึกษา 3. มัธยมศึกษาตอนต้น

4. มัธยมศึกษาตอนปลาย 5. อื่นๆ (ระบุ).....

5. คุณมีโรคประจำตัวหรือไม่?

A 5

1. มี 2. ไม่มี... ไปตอบคำถาม ข้อ 7

6. กรุณาบอกเกี่ยวกับโรคประจำตัวของคุณ (ตอบได้มากกว่า 1 ข้อ)

6a. พิกอร์ทางสายตา, หู หรือร่างกาย

1. ใช่

2. ไม่ใช่

6a

6b. โรคข้ออักเสบรูมาตอยด์

1. ใช่

2. ไม่ใช่

6b

6c. หอบหืด

1. ใช่

2. ไม่ใช่

6c

6d. โรคไตวาย เรื้อรัง

1. ใช่

2. ไม่ใช่

6d

6e. เบาหวาน

1. ใช่

2. ไม่ใช่

6e

6f. โรคตับเรื้อรัง	<input type="checkbox"/>	1. ใช่	<input type="checkbox"/>	2. ไม่ใช่	6f	<input type="checkbox"/>
6g. โรคหัวใจ	<input type="checkbox"/>	1. ใช่	<input type="checkbox"/>	2. ไม่ใช่	6g	<input type="checkbox"/>
6h. โรคความดันโลหิตสูง	<input type="checkbox"/>	1. ใช่	<input type="checkbox"/>	2. ไม่ใช่	6h	<input type="checkbox"/>
6i. ไวรัสตับอักเสบบ	<input type="checkbox"/>	1. ใช่	<input type="checkbox"/>	2. ไม่ใช่	6i	<input type="checkbox"/>
6j. ภาวะกระดูกพรุน	<input type="checkbox"/>	1. ใช่	<input type="checkbox"/>	2. ไม่ใช่	6j	<input type="checkbox"/>
6k. มะเร็ง	<input type="checkbox"/>	1. ใช่	<input type="checkbox"/>	2. ไม่ใช่	6k	<input type="checkbox"/>
6l. หลอดเลือดสมองอุดตัน	<input type="checkbox"/>	1. ใช่	<input type="checkbox"/>	2. ไม่ใช่	6l	<input type="checkbox"/>
6m. โรคลมชัก	<input type="checkbox"/>	1. ใช่	<input type="checkbox"/>	2. ไม่ใช่	6m	<input type="checkbox"/>
6n. อื่นๆ โปรดระบุ.....	<input type="checkbox"/>	1. ใช่	<input type="checkbox"/>	2. ไม่ใช่	6n	<input type="checkbox"/>

ภาค B: ข้อมูลด้านเศรษฐกิจ

7. อาชีพ

B 7

1. ไม่ประกอบอาชีพ 2. รับจ้างประจำ 3. ทำการเกษตร
 4. ค้าขาย 5. ข้าราชการเกษียณ 6. อื่นๆ

(ระบุ).....

8. รายได้ต่อเดือน.....บาท

B 8.....

มีปัญหาด้านการเงิน

B 9

ไม่เลย	เล็กน้อย	ปานกลาง	มาก	มากที่สุด
1	2	3	4	5

ภาค C: WHOQOL

คำถามต่อไปนี้จะถามว่าคุณรู้สึกอย่างไรกับคุณภาพชีวิต สุขภาพ หรือด้านอื่นๆ ในชีวิตคุณ โดยเจ้าหน้าที่จะอ่านแต่ละคำถาม พร้อมกับคำตอบที่เป็นตัวเลือกให้คุณฟัง โปรดเลือกคำตอบที่คุณพบว่าเหมาะสมที่สุด ถ้าคุณไม่แน่ใจเกี่ยวกับคำตอบในแต่ละคำถาม คำตอบแรกที่คุณคิดจะเป็นคำตอบที่ดีที่สุด เราจะถามถึงความคิดที่คุณมีเกี่ยวกับชีวิตของคุณเองในช่วง 4 อาทิตย์ที่ผ่านมา

สำหรับเจ้าหน้าที่

ข้อความ	ไม่ดี อย่าง มาก	ไม่ดี	ปาน กลาง	ดี	ดีมาก	
1. คุณให้คะแนนคุณภาพชีวิตของคุณอย่างไร?	1	2	3	4	5	QOL 1 <input type="checkbox"/>
ข้อความ	ไม่ พอใจ มาก	ไม่ พอใจ	เฉยๆ	พอใจ	พอใจ มาก	
2. คุณพอใจเกี่ยวกับสุขภาพของคุณอย่างไร?	1	2	3	4	5	QOL 2 <input type="checkbox"/>

คำถามต่อไปนี้จะถามเกี่ยวกับประสบการณ์ของคุณ ในบางสิ่งบางอย่างว่ามีมากน้อยแค่ไหนในช่วง 4 อาทิตย์ที่ผ่านมา

ข้อความ	ไม่เลย	เล็กน้อย	ปาน กลาง	มาก	มาก ที่สุด	
3. คุณมีความรู้สึกเจ็บปวดทางร่างกายจนไม่สามารถที่จะทำในสิ่งที่คุณอยากทำมากน้อยเพียงใด?	5	4	3	2	1	QOL 3 <input type="checkbox"/>

ข้อความ	ไม่เลย	เล็กน้อย	ปานกลาง	มาก	มากที่สุด	
4. คุณต้องการ การบำบัดทาง การแพทย์อย่างน้อยแค่ไหน เพื่อให้ สามารถปฏิบัติภารกิจประจำวันได้?	5	4	3	2	1	QOL 4 <input type="checkbox"/>
5. คุณมีความสุขในชีวิตอย่างน้อยแค่ไหน?	1	2	3	4	5	QOL 5 <input type="checkbox"/>
6. คุณรู้สึกว่าคุณมีชีวิตที่มีความหมายแค่ไหน?	1	2	3	4	5	QOL 6 <input type="checkbox"/>
7. คุณสามารถที่จะมีสมาธิได้ดีเพียงใด?	1	2	3	4	5	QOL 7 <input type="checkbox"/>
8. คุณรู้สึกว่าชีวิตประจำวันของคุณปลอดภัยแค่ไหน?	1	2	3	4	5	QOL 8 <input type="checkbox"/>
9. คุณรู้สึกว่าสิ่งแวดล้อมของคุณถูกสุขอนามัยแค่ไหน?	1	2	3	4	5	QOL 9 <input type="checkbox"/>

คำถามต่อไปนี้จะถามเกี่ยวกับสิ่งที่ได้รับประสบ หรือสามารถจะทำบางสิ่งบางอย่างได้ สมบูรณ์ครบถ้วนอย่างไร

ในช่วง 4 อาทิตย์ที่ผ่านมา

ข้อความ	ไม่เลย	เล็กน้อย	ปานกลาง	ส่วนใหญ่	ได้สมบูรณ์	
10. คุณมีกำลังเพียงพอในการดำเนินชีวิตประจำวันหรือไม่?	1	2	3	4	5	QOL 10 <input type="checkbox"/>
11. คุณสามารถที่จะยอมรับรูปร่างหน้าตาของคุณเองหรือไม่?	1	2	3	4	5	QOL 11 <input type="checkbox"/>

ข้อความ	ไม่เลย	เล็กน้อย	ปานกลาง	ส่วนใหญ่	ได้สมบูรณ์	
12. คุณมีเงินเพียงพอที่จะใช้จ่ายหรือไม่?	1	2	3	4	5	QOL 12 <input type="checkbox"/>
13. คุณได้รับข้อมูลที่คุณต้องการในการดำเนินชีวิตประจำวันแค่ไหน?	1	2	3	4	5	QOL 13 <input type="checkbox"/>
14. คุณมีโอกาสที่จะทำกิจกรรมยามว่างมากน้อยแค่ไหน?	1	2	3	4	5	QOL 14 <input type="checkbox"/>
ข้อความ	ไม่ดีอย่างมาก	ไม่พอใจ	ปานกลาง	ดี	ดีมาก	
15. คุณสามารถที่จะไปไหนมาไหนได้ดีเพียงใด?	1	2	3	4	5	QOL 15 <input type="checkbox"/>
ข้อความ	ไม่พอใจมาก	ไม่พอใจ	เฉยๆ	พอใจ	พอใจมาก	
16. คุณพอใจกับการนอนหลับของคุณอย่างไร?	1	2	3	4	5	QOL 16 <input type="checkbox"/>
17. คุณพอใจกับความสามารถของคุณในการดำเนินกิจกรรมในชีวิตประจำวันอย่างไร?	1	2	3	4	5	QOL 17 <input type="checkbox"/>
18. คุณพอใจกับความสามารถในการทำงานของคุณอย่างไร?	1	2	3	4	5	QOL 18 <input type="checkbox"/>
19. คุณพอใจกับตัวของตนเองแค่ไหน?	1	2	3	4	5	QOL 19 <input type="checkbox"/>

ข้อความ	ไม่ พอใจ มาก	ไม่ พอใจ	เฉยๆ	พอใจ	พอใจ มาก	
20. คุณพอใจกับความสัมพันธ์ ส่วนตัวของคุณอย่างไร?	1	2	3	4	5	QOL 20 <input type="checkbox"/>
21. คุณพอใจกับชีวิตพิเศษของคุณ อย่างไร?	1	2	3	4	5	QOL 21 <input type="checkbox"/>
22. คุณพอใจเกี่ยวกับการสนับสนุน ที่คุณได้รับจากเพื่อนๆ อย่างไร?	1	2	3	4	5	QOL 22 <input type="checkbox"/>
23. คุณพอใจกับสภาพที่อยู่อาศัยของ คุณอย่างไร?	1	2	3	4	5	QOL 23 <input type="checkbox"/>
ข้อความ	ไม่ พอใจ มาก	ไม่ พอใจ	เฉยๆ	พอใจ	พอใจ มาก	
24. คุณพอใจเกี่ยวกับการที่คุณ สามารถเข้าถึงการบริการทางด้าน สุขภาพอย่างไร?	1	2	3	4	5	QOL 24 <input type="checkbox"/>
25. คุณพอใจเกี่ยวกับการเดินทาง ของคุณอย่างไร?	1	2	3	4	5	QOL 25 <input type="checkbox"/>

คำถามต่อไปนี้จะกล่าวถึงความรู้สึก หรือประสบการณ์ที่คุณได้รับ เกี่ยวกับบางสิ่ง
บางอย่าง ที่เกิดขึ้นบ่อยๆ ในช่วง 4 อาทิตย์ที่ผ่านมา

ข้อความ	ไม่เคย เลย	น้อย ครั้ง	ค่อนข้าง บ่อย	บ่อย มาก	ตลอดเวลา	
26. คุณมีความรู้สึกในด้านลบ เช่น ความรู้สึก เศร้า ผิดหวัง วิตก กังวล หดหู่ใจบ่อยครั้งแค่ไหน?	5	4	3	2	1	QOL 26 <input type="checkbox"/>

ภาค D: WHOQOL-OLD

คำถามต่อไปนี้เป็นคำถามเกี่ยวกับ ความมากน้อยในประสบการณ์ที่ท่านมี ในช่วง 2 อาทิตย์ที่ผ่านมา เช่น ความเป็นอิสระ และความรู้สึกต่อการกำหนดชีวิตของตัวเอง ถ้าท่านมีประสบการณ์เกี่ยวกับสิ่งต่างๆเหล่านี้ มากที่สุด โปรดตอบ “มากที่สุด” และถ้าท่านไม่มีประสบการณ์เกี่ยวกับสิ่งต่างๆเหล่านี้ โปรดตอบ “ไม่เลย” สำหรับเจ้าหน้าที่

ข้อความ	ไม่เลย	เล็กน้อย	ปานกลาง	มาก	มากที่สุด	
1. การที่คุณสูญเสียการรับรู้ (เช่น การได้ยิน, การมองเห็น, การลิ้มรส, การดมกลิ่น, การสัมผัส) มีผลต่อชีวิตประจำวันมากน้อยเพียงใด?	1	2	3	4	5	OLD 1 <input type="checkbox"/>
2. คุณมีการสูญเสีย การรับรู้เช่น การได้ยิน, การมองเห็น, การลิ้มรส, การดมกลิ่น, หรือการสัมผัส มีผลกระทบต่อความสามารถในการทำกิจกรรม มากน้อยเพียงใด?	1	2	3	4	5	OLD 2 <input type="checkbox"/>
3. คุณมีอิสระในการตัดสินใจ มากน้อยเพียงใด?	1	2	3	4	5	OLD 3 <input type="checkbox"/>
4. คุณมีความสามารถในการกำหนดอนาคตของคุณเองมากน้อยเพียงใด?	1	2	3	4	5	OLD 4 <input type="checkbox"/>
5. คุณรู้สึกว่าคนรอบข้างคุณเคารพในเสรีภาพของคุณมากน้อยเพียงใด?	1	2	3	4	5	OLD 5 <input type="checkbox"/>
6. คุณมีความกังวลมากน้อยเพียงใดเกี่ยวกับสาเหตุที่จะทำให้คุณตาย?	1	2	3	4	5	OLD 6 <input type="checkbox"/>

ข้อความ	ไม่เคย	เล็กน้อย	ปานกลาง	มาก	มากที่สุด	
7. คุณกลัวว่าคุณจะไม่สามารถควบคุมการตายของคุณได้ มากน้อยเพียงใด?	1	2	3	4	5	OLD 7 <input type="checkbox"/>
8. คุณกลัวความตายมากน้อยเพียงใด?	1	2	3	4	5	OLD 8 <input type="checkbox"/>
9. คุณกลัวว่าจะได้รับความเจ็บปวดก่อนตายมากน้อยเพียงใด?	1	2	3	4	5	OLD 9 <input type="checkbox"/>

คำถามต่อไปนี้จะถามเกี่ยวกับสิ่งที่คุณได้รับประสบ หรือ สามารถจะทำบางสิ่งบางอย่างได้สมบูรณ์ครบถ้วนอย่างไร ในช่วง

2 อาทิตย์ที่ผ่านมา

ข้อความ	ไม่เคยเลย	เล็กน้อย	ปานกลาง	มาก	มากที่สุด	
10. ปัญหาที่เกี่ยวข้องระบบการรับรู้ของคุณ (เช่น การได้ยิน, การมองเห็น, การลิ้มรส, การดมกลิ่น, การสัมผัส) มีผลกระทบต่อความสามารถในการทำกิจกรรมร่วมกับผู้อื่นมากน้อยเพียงใด?	1	2	3	4	5	OLD 10 <input type="checkbox"/>
ข้อความ	ไม่เคย	เล็กน้อย	ปานกลาง	ส่วนใหญ่	ได้สมบูรณ์	
11. คุณสามารถทำในสิ่งที่คุณอยากทำ มากน้อยเพียงใด?	1	2	3	4	5	OLD 11 <input type="checkbox"/>

ข้อความ	ไม่เคย	เล็กน้อย	ปานกลาง	ส่วนใหญ่	ได้สมบูรณ์	
12. คุณพอใจในโอกาสที่คุณประสบความสำเร็จในชีวิตมากน้อยเพียงใด?	1	2	3	4	5	OLD 12 <input type="checkbox"/>
13. คุณรู้สึกมากน้อยเพียงไร กับการที่คุณได้รับในสิ่งที่คุณสมควรที่จะได้รับ?	1	2	3	4	5	OLD 13 <input type="checkbox"/>
14. คุณมีความรู้สึกมากน้อยแค่ไหน ว่า คุณได้ทำงานในแต่ละวันอย่างพอเพียง?	1	2	3	4	5	OLD 14 <input type="checkbox"/>

คำถามต่อไปนี้จะถามท่านเกี่ยวกับ ความพอใจ ความสุขหรือความดี ที่ท่านมีความรู้สึกเกี่ยวกับแง่มุมต่างๆในชีวิตของท่าน มากกว่า 2 อาทิตย์ที่ผ่านมา เช่น การเข้าไปมีส่วนร่วม กับชุมชน หรือ การประสบความสำเร็จในชีวิตของท่าน กรุณาตอบตามความรู้สึกของท่านในช่วง 2 อาทิตย์ที่ผ่านมา

ข้อความ	ไม่พอใจมาก	ไม่พอใจ	เฉยๆ	พอใจ	พอใจมาก	
15. คุณพอใจกับการที่คุณประสบความสำเร็จในชีวิตเพียงใด?	1	2	3	4	5	OLD 15 <input type="checkbox"/>
16. คุณพอใจกับการจัดสรรเวลาของคุณมากน้อยเพียงใด?	1	2	3	4	5	OLD 16 <input type="checkbox"/>
17. คุณพอใจกับระดับในการทำกิจกรรมของท่านเพียงใด?	1	2	3	4	5	OLD 17 <input type="checkbox"/>

ข้อความ	ไม่ พอใจ มาก	ไม่ พอใจ	เฉยๆ	พอใจ	พอใจ มาก	
18. คุณพอใจกับโอกาสในการเข้าร่วมกิจกรรมของชุมชน มากน้อยเพียงใด?	1	2	3	4	5	OLD 18 <input type="checkbox"/>
19. คุณมีความสุขกับสิ่งที่คุณสามารถคาดหวังว่าจะได้รับ มากน้อยเพียงใด?	1	2	3	4	5	OLD 19 <input type="checkbox"/>
ข้อความ	แย่มาก	แย่	เฉยๆ	ดี	ดีมาก	
20. คุณมีการรับรู้รู้สึก (เช่น การไต่ยีน, การมองเห็น, การลิ้มรส, การดมกลิ่น, การสัมผัส) ดีมากน้อยเพียงใด?	1	2	3	4	5	OLD 20 <input type="checkbox"/>

กรุณาตอบคำถามที่กล่าวถึง ความสัมพันธ์ส่วนตัวที่ท่านมี กรุณาพิจารณาคำถามเหล่านี้ที่อาจกล่าวถึงคู่ชีวิตหรือบุคคลที่คุณใกล้ชิดที่ท่านสามารถร่วมทุกข์ร่วมสุขมากกว่าคนอื่นทั้งหมดในชีวิตท่าน

ข้อความ	ไม่เลย	เล็กน้อย	ปานกลาง	มาก	มากที่สุด	
21. คุณมีความรู้สึกว่าการมีเพื่อน มีความสำคัญในชีวิตมากน้อยแค่ไหน?	1	2	3	4	5	OLD 21 <input type="checkbox"/>
22. ในชีวิตของคุณ คุณมีประสบการณ์เกี่ยวกับความรัก มากน้อยเพียงใด?	1	2	3	4	5	OLD 22 <input type="checkbox"/>

Appendix C: Published articles

**The impact of visual impairment on quality of life among
older persons in a rural area of Northeast Thailand**

**The impact of self-reported visual disability on quality of
life among older persons in a rural area of Northeast
Thailand: A follow-up study**

