

**ASSESSMENT OF ORIENTATION AND MOBILITY AMONG THE
BLIND IN THE BANGKOK METROPOLITAN AREA**



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THE REQUIREMENTS FOR THE DEGREE OF
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Thesis
entitled

**ASSESSMENT OF ORIENTATION AND MOBILITY AMONG THE BLIND IN
THE BANGKOK METROPOLITAN AREA**



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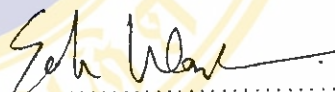
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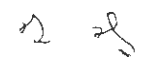
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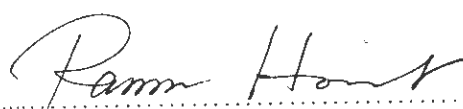

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ASSESSMENT OF ORIENTATION AND MOBILITY AMONG THE BLIND IN
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ABSTRACT

This cross-sectional study was conducted to assess the orientation and mobility (O&M) status and relationship between O&M status and personal factors, history of visual impairment, environmental factors and psychological factors among the blind. The sample studied was 173 blind subjects who were 21 to 67 years old and who had been living in the Bangkok Metropolitan area for more than a half year prior to the date of data collection, 24 Dec 2003 to 22 Jan 2004. Inquiry with open ended questions was designed to identify the subjects' real difficulty in travelling and their opinions about how the Thai government can help.

The major findings of this study were as follows: The young generation, 21-30 years old, showed high level of access to public facilities ($p=0.021$). Female subjects spent less time walking than males ($p=0.044$). Illiterate subjects had less access to public facilities than educated subjects ($p=0.001$). Those who came from northeastern Thailand had less access than those who came from Bangkok and other regions ($p=0.007$). With regard to the history of visual impairment, the total blind group had less access than subjects in the low vision group ($p=0.021$). O&M training or mobility related training was considered to be an effective strategy to improve accessibility ($p=0.047$). The total score of support from society was negatively correlated with the frequency of going out from the home ($r=-0.180$). Summation of psychological factors was positively correlated with ability to access public facilities ($r=0.405$). Public bus service was listed as a leading mode of transportation for the blind (59.3%). However, blind subjects mentioned utilizing public bus service as the most difficult part in their travel and required improvement of public bus service.

These findings would be beneficial for policy makers to consider implementing effective intervention or supports for the blind. The O&M training was considered to be the most important intervention to create better mobility status with independence in terms of normalization and equal access in the society.

KEY WORD(S) : ORIENTATION AND MOBILITY/BLIND

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CHAPTER I

INTRODUCTION

1.1 Rationale and justification

In Asia in the early 1990's, economic growth and social development have brought a huge amount of impact on people's life and brought a social development. Social infrastructure was reformed and human's life style has changed dramatically in a short period. Many skyscrapers, highways were constructed to meet the needs of expanded traffics and traffic rules started to limit people's locomotive activities. Consequently, pedestrians in a congested area such as Bangkok have become more inconvenient to travel from place to place because of a decreased number of cross-sections, newly constructed pedestrian bridge, extended highway, traffic jam and air pollution. Nevertheless, infrastructures for mass transportation such as underground train, sky train, advanced public bus service to meet the expanding demand are still not enough (1).

Especially for people with disabilities in this changing situation it is not easy to deal with and what they have got as a benefit of economic growth and what they have lost as a consequence of environmental modification are difficult to measure.

On the other hand, improved communication system and education level have enabled society to evoke social movement for disabled person to claim human right and better life standard.

In 1957, the Office of Special Education for Disadvantage Children was launched in Bangkok as an initiative action to improve quality of life among the disabled. The quality of education and number of rehabilitation facilities have increased during these decades. However shortage of budget and human recourses are still serious social issues (2).

Since 1981, an International Year of Disabled Persons, rehabilitation service for the disabled of public and private sector have been greatly emphasized (3).

The United Nations Organization later proclaimed the “The World Program of Action Concerning Disabled Person” to be used as an implementation guideline in the UN Decade of Disabled (1983-1992). This has led to many operational changes in Thailand. Since 1991, the law directly involving the disabled was legislated. It was called Rehabilitation of Disabled Persons Act 1991. This act assigned the Committee for Rehabilitation of Disabled person to take responsibility for development and rehabilitation of the disabled. The rehabilitation plan for disabled person pursuant to the 8th National Social and Economic Development Plan (1997-2001) was adopted as a guideline and a measure for rehabilitation of disabled. It concentrated on rehabilitation service in 4 main areas, which are “medical”, “educational”, “vocational and employment” and “social rehabilitation” (3).

The government have proclaimed Rehabilitation of Disabled Persons Act 1991 which advocate the equity of disabled person compare to the healthy citizen. The law provide opportunity for disabled person who have registered under the law can have a right to get following services (4):

- Medical rehabilitation service, expenses for medical treatment, aids and equipment for rehabilitating physical, mental or psychological conditions or for improving capacities as prescribed in the Ministerial Regulations.

- Education in consonance with the compulsory, vocational or university education under the National Education Plan as considered appropriate. Such education may be provided in the special school or through mainstreaming in the ordinary school whereby the Center for Innovation and Technology attached to the Ministry of Education shall provide support as deemed appropriate.

- Advice and consultation relating to occupation and vocational training appropriate to their physical conditions and potentialities so as ensure their potentials to work.

- Entitlement to participation in social activities and access to various facilities and services essential to them.

- Government lawsuit services and contact with governmental organizations.

From the 8th National Social & Economic Development Plan (1997-2001), the disability support was also taken as the master plan which is advocated by both government organization (GO) and non-government organization (NGO) to investigate the present activity and to develop the service and information system under the cooperation among GO, NGOs and private sectors (3).

According to the survey of National Statistical Office in 1995, total number of disabled persons in Thailand were 1,024,120 cases which shared 1.7% of total population while The Thai Public Health Foundation indicated the total number of disable persons in the same year as 4,825,682 cases which shared 8.08% of total Thai population (5). However according to the registration statistics of disability classified by sex from 1st Nov, 1994 to 31st December, 2003 the total number of person with disability (PWD) were only 363,811 cases, which is shown below in Table 1.

Table 1 Registration statistics of disability classified by sex from 1st Nov, 1994-31st December, 2003

| Type of disability | Number | | |
|-----------------------------|----------------|----------------|-----------------|
| | Male(%) | Female(%) | Total(%) |
| Visual impairment | 20,193(5.55) | 17,800 (4.89) | 37,993 (10.44) |
| Audio impairment | 28,949(7.96) | 24,376 (6.70) | 24,376 (14.66) |
| Physical impairment | 113,311(31.15) | 60,914(16.74) | 174,225(47.89) |
| Mental problems | 5,180(1.42) | 3,305(0.91) | 8,485(2.33) |
| Mental retardation | 27,107(7.45) | 22,463(6.17) | 49,570(13.62) |
| Multiple disability | 20,327(5.59) | 14,785(4.06) | 35,112(9.65) |
| Unknown (Ill derive) | 3,009(0.83) | 2,092(0.58) | 5,101(1.41) |
| Total | 218,076(59.95) | 145,735(40.05) | 363,811(100.00) |

Source: Bureau of Disables Promotion and Protection, Department of Welfare and Protection for Children, Youth, Underprivileged, Disables and Elderly, 2003.

According to the survey conducted by the Thai Public Health Foundation in 1996, indicated that 1.62% of total population are blinds, while the Registration statistics of disability classified by sex from 1st Nov, 1994-31st December, 2003 accounted for total blinds only 0.06% of total population (5).

Table 2 Registration statistics of disability classified by region from 1st Nov, 1994-31st December, 2003

| Regions | | Number of persons |
|--------------|----------------------------|-------------------|
| 1 | Bangkok | 23,287 |
| 2 | Central or Eastern regions | 81,600 |
| 3 | Northern region | 81,340 |
| 4 | North-Eastern region | 133,356 |
| 5 | Southern region | 44,228 |
| Total | | 363,811 |

Source: Bureau of Disables Promotion and Protection, Department of Welfare and Protection for Children, Youth, Underprivileged, Disables and Elderly, 2003.

From table 2 and 3 person with disability or blinds in northeastern region was higher than other regions. From table 3, total number of the blind living in Bangkok cumulated from 1st Nov, 1994-31st to December, 2003 is found to be 2,164 cases.

Table 3 Registration statistics of visual impairment by sex and regions from 1st Nov, 1994-31st December, 2003

| | Region | Gender | | |
|--------------|----------------------------|---------------|---------------|---------------|
| | | Male | Female | Total |
| 1 | Bangkok | 1,288 | 876 | 2,164 |
| 2 | Central or Eastern regions | 3,399 | 2,948 | 6,347 |
| 3 | Northern region | 4,512 | 3,835 | 8,347 |
| 4 | North-Eastern region | 8,899 | 8,556 | 17,455 |
| 5 | Southern region | 2,095 | 1,585 | 3,680 |
| Total | | 20,193 | 17,800 | 37,993 |

Source: Bureau of Disables Promotion and Protection, Department of Welfare and Protection for Children, Youth, Underprivileged, Disables and Elderly

With regard to the movement of central level, prospect of mobility is also considered to be crucial to improve quality of life (QOL) among the disabled person. While a large amount of study related with QOL among blind person have done during the same period of the 8th plan, mobility itself is still not thought highly of by

society when amount of literature and publications related with mobility was taken into account.

Integrated support for disables need a large amount of budget and human resources from different sectors. So wide and cross-spectral investigation is required to meet the demand. However, in this period there is no organization that conducts total activities and provide holistic approach toward medical, educational, vocational, and environmental field in order to cope with issue of disability in Thailand.

This study is conducted to identify the current situation of mobility and related factors among the blind who are living in Bangkok which is a famous place not only as a huge urban city in South East Asia but also for its congested traffics.

The result of this study will be beneficial for those responsible organization (GO, NGO and private sectors) to use as baseline information to plan for appropriate intervention measures to help for better life among the blind especially how to overcome with the daily mobility problems. Moreover, findings in this study will make benefit for other study in future.

1.2 Research question

What is the orientation and mobility status and its related factors among the blind who live in Bangkok?

1.3 Research objectives

1.3.1 General objectives

To assess orientation and mobility status in public sphere and its related factors among the blind

1.3.2 Specific objectives

1. To assess orientation and mobility status among the blind.
2. To describe all following factors
 - 2.1 Personal characteristics of the blind composed of age, gender, education, occupation, resident and experiences of fall and injury.
 - 2.2 History of visual impairment composed of type of blindness, Onset of blindness and duration of blindness
 - 2.3 Environmental factors composed of Orientation and Mobility training, Social support which is composed of instrumental support, emotional support and information support.
 - 2.4 Psychological factors composed of psychological effect on transportation, perception of own disability, psychological impact of barrier and obstacles outside from the house, and perception of prejudice and stigmatization.
3. To identify relationships between personal factors, history of impairment, environmental factors, psychological factors and mobility status in public sphere among the blinds.
4. To explore the mode of transportation.

1.4 Conceptual framework

Independent variables

Personal factor

- Age
- Gender
- Occupation
- Education
- Place of birth
- Experience of fall and injury

History of visual impairment

- Grade of blindness
- On set of blindness
- Duration of blindness

Environmental factor

- O&M training
- Training from family or community
- Support from society
(Instrumental support, Emotional support, Information support)

Psychological factor

- Perception of barriers and obstacles outside from the house
- Perception of own disability, social discrimination and confidence

Dependent variable

Mobility

Physical mobility

- Frequency of go out of home
- Average walking time

Functional mobility

- Accessibility to public facilities

1.5 Operation definition

Personal factor: Are composed of socio-demographic factors and experience of fall and injury. **Experience of fall** is counted as total number of fall within the last year and **Experience of injury** is counted as total number of injuries experienced in each individual's life.

History of visual impairment: It is composed of following factors.

Grade of blindness: It is divided into two categories as total blind and low vision.

Onset of blindness: It is the age in which blindness was developed. If it is congenital, it is counted as zero value.

Duration of blindness: It indicates the duration from the time when present symptom was developed to the time of interview ($\text{Duration} = \text{Time to interview} - \text{Time to develop}$).

Environmental factors: It is composed of support from society including family and community and experience of O&M training.

Support from society: It has been defined as a variety of materials and service, information and emotional assistance for the blind to participate in transportation and travelling around outside home.

Instrumental support: It refers to the blind's recognition of receiving direct aid in the forms of services related with mobility. For example to be a sighted guide when they go out from home as a family or community member to which the blind belong and giving hand for the blind as others meeting with the blind occasionally in travelling situation.

Emotional support: means that blind is reassured by others in the sense that they make him or her feel loved or cared. For example this kind of support will make the blind less anxious, allow him or her to feel more confidence to travel around Bangkok and encourage them for further mobility.

Information support: refers to the blind's recall about being given information by their community people or others to compensate for their impaired visual information.

O&M training: It is composed of several interventions according to the AFB (American Foundation for Blindness) and 1-4 was interviewed without technical terms in this study (7-8).

1. Early assessment and intervention
2. Cane skills training
3. Visual therapy
4. Teaching daily living skills

Psychological factors: It is composed of following categories:

1: Perception of impairment: It is a perception of blindness in their daily life.

2: Perception of environmental factors: It is considered as perception of architecture barriers in urban place. Subjective feeling of their concern about obstacles, uneasiness for travelling is a variable in this study.

3: Perception of mobility: It is a psychological effect on the comfortness of transportation while traveling.

4: Perception of negative relationship: It is a perception of stigmatization, prejudice and discriminations from society.

5: Perception of overprotection: It is a misunderstanding of persons to deal with disable children is a relevant factor for the respondents' perception on impact of negative relationship. Since overprotection often disturb the natural process of development for children.

Orientation and Mobility: It is defined as the ability to move or travel around easily (9). From the concept of ICFDH-2 (10) mobility in this study is regarded as participation restriction (p10300: participation for transportation) which is closely linked with limitation of activity (a40400: travel as a pedestrian, a40500: utilization of transportation).

In this study, following classification of mobility and functional oriented assessment are employed. Functional mobility is measured in rating scores at first and described with summation of the total scores.

- **Physical mobility** : It is measured in following categories:

- Average amount of walking time in a day

- Frequency of going out in a week

- **Functional mobility** : It derived as accessibility of following public facilities:

- Governmental office, Market, Department store, Post office, Buffet, Hospital, Barber, Thai National Institute for Blind, Social Welfare council.

- In case respondent was total blind, accessibility with sighted guide was questioned.

1.6 Scope of the study

Mainly variables mentioned in the conceptual framework are described and analyzed as quantitative data. Further more additional study such as mode of transportation is explored and difficult point of present situation with regard to mobility among the blind and requirement of the blind for government are inquired as qualitative data in order to find out recommendations for government policy making and reformation of education system for the blind.

1.7 Limitation of this study

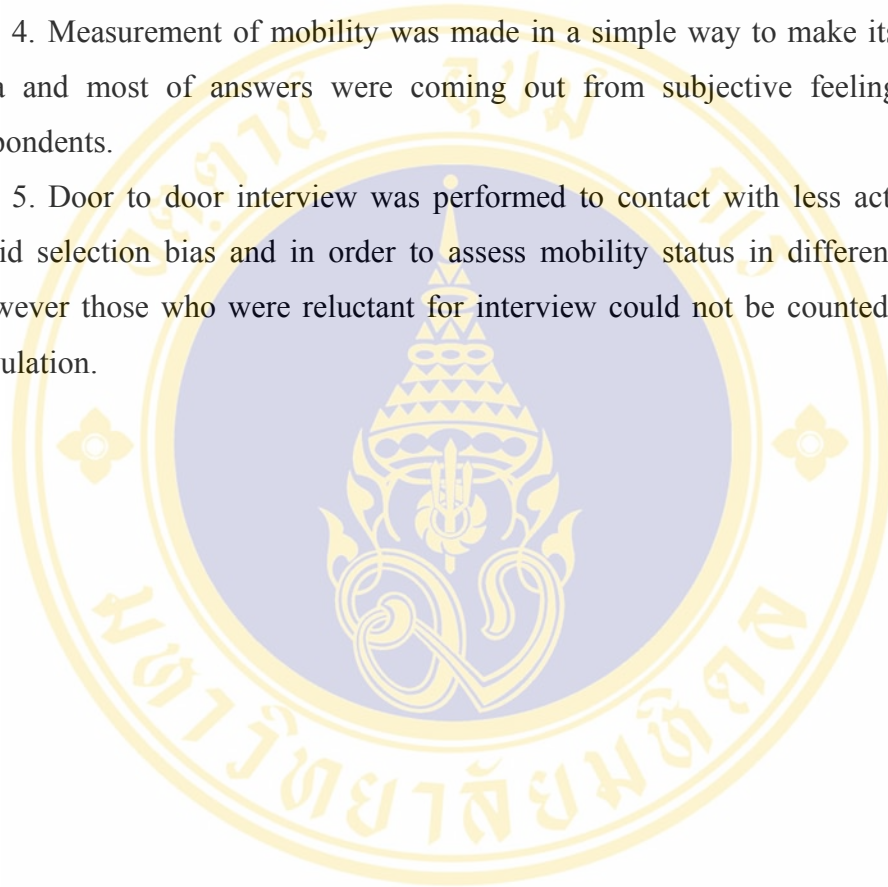
1. In this study sample population was collected from only those who are staying in Bangkok metropolitan area more than 6 months that did not represent total blind population of Thailand.

2. Mobility measurements adapted from ICFDH-2 were emphasized for outside home mobility (public sphere) but for indoor (domestic) mobility were not taken into account.

3. Ranges of age are restricted over 20 because among those who are younger age groups most of them stayed in a boarding school and the opportunity to go outside from school is limited or transportation is mostly facilitated by the school bus. In addition, students in the college level and vocational school also normally stayed together in a dormitory facilitated by their study place.

4. Measurement of mobility was made in a simple way to make its quantitative data and most of answers were coming out from subjective feeling among the respondents.

5. Door to door interview was performed to contact with less active blinds to avoid selection bias and in order to assess mobility status in different viewpoints. However those who were reluctant for interview could not be counted as the study population.



CHAPTER II

LITERATURE REVIEW

2.1 Overview of the blind's situation in the World and in Thailand

Visual impairment is the most frequently reported chronic health problem in the USA. Blindness and severe visual impairment are prevalent throughout the world. According to the World Health Organization (1980), an estimated 30 million to 40 million people in the world are blind. Prevent Blindness America, 1992 estimates that there are approximately 900,000 legally blind people over the age of forty in the US and more than 11.4 million people were a severe vision impairment that preclude reading news print (11).

According to the survey about causes of disabilities conducted by Economic and Social Commission for Asia and the Pacific (ESCAP), it was indicated that malnutrition, communicable disease, low quality of basic health care and accident are the leading causes of blindness in Thailand. While worldwide the most common causes of blindness are cataract trachoma, onchocerciasis, exophthalmia, injuries, glaucoma, muscular disease, optic nerve atrophy, diabetic retinopathy, and retinitis pigmentosa (12).

Most of the blindness throughout the world is preventable through nutritional, therapeutic, and sanitation improvement programs.

Different proportions in the population are affected by these diseases. For example, in U.S., whites tend to have more macular degeneration than blacks, whereas blacks are blinded from glaucoma more frequently than whites. Also, the incidence of visual impairment increases with age. It have been estimated that more

than 70 % of the visually impaired people in the U.S. are over age 65 (11) while over 50% of blinds are counted under age 50 in Thailand.

Following Table 4 shows the age related figure of total blindness in Thailand according to the Report of the health and welfare survey in 1991 (12).

Table 4 Age distribution of the blind in Thailand, 1991

| Age group | One-eyed blindness | Two-eyed blindness |
|------------|--------------------|--------------------|
| 0-6 | 2,200 | 2,000 |
| 7-10 | 3,500 | 900 |
| 11-14 | 3,200 | 1,700 |
| 15-19 | 8,400 | 2,000 |
| 20-24 | 9,500 | * |
| 25-29 | 9,300 | 800 |
| 30-34 | 6,400 | 2,600 |
| 35-39 | 2,700 | 4,300 |
| 40-49 | 13,900 | 3,900 |
| 50-59 | 14,400 | 4,700 |
| 60and over | 25,600 | 25,600 |
| Total | 99,600 | 48,900 |

Source: The Health and Social Welfare survey, 1991

It indicates that distribution of the blind is shifted toward young generations, which imply magnitude of this health issue is deeper than U.S. in terms of high incidence of preventable blindness and prevalence in high productive ages who need further participation to the society.

2.2 Theoretical models of assessment of mobility among the blind (Classification of disease, impairment and disability)

According to the International Classification of Impairments, Disabilities, and Handicaps (ICIDH-1: Classic classification) (13) one way concept of taxonomy had been advocated.

However, after the year 1990 controversial argument evoked concerning about definition of disease, impairment, and disability in many aspect socially, politically,

ethically and philosophically and still not settled down. Nevertheless following terminology and conceptual flow chart is recommended by WHO as an International Classification of Impairments, Disabilities, and Handicaps (ICDIH-2 classification) (10).

a) *Health condition* : “diseases, disorders, injuries, etc. . . that are classified primarily to ICD-10 which provides an etiological framework”

b) *Impairment* : “problems in body function or structure such as a significant deviation or loss” (structure) Impairment : nervous system, eye, ear and related structures, voice and speech structures, cardiovascular, immunological, and respiratory structures, digestive, metabolic and endocrine structures, genitourinary and reproductive structures, structures related to movement, skin and related structures

(functional) Impairment : mental, sensory and pain, voice and speech, cardiovascular, hematological immunological, respiratory systems, digestive, metabolic, endocrine systems, genitourinary, reproductive systems, neuromusculoskeletal and movement-related, skin and related structures

c) *Environmental factors* : “refer to all aspects of the external or intrinsic world that form the context of an individuals life and, as such, have an impact on that person’s functioning.”

Classification of environmental factors

- Products and technology
- Natural environment and human-made changes to it
- Supports and relationships
- Attitudes
- Services, systems and policies

d) *Personal factors* :

- Not well described
- Not classified at all
- Such things as age, race, sex, social status, life experiences, etc.

e) *Disability* : “An umbrella term for impairments, activity limitations and participation restrictions. It denotes the negative aspects of the interaction between an individual (with a health condition) and that individual’s contextual factors (environmental and personal factors)” f) Term “*Handicap*” is no longer recommended and replaced by the term ‘participation restriction’ Basically, this term was eliminated because of perceived pejorative connotation that placed the onus of disability on the person rather than on the environment

Disease < Impairment < Disability < Handicap

Figure 1: International classification of Impairments, Disabilities, and Handicaps (ICIDH-1)

ICIDH(the WHO framework) has been favored in public health and political settings,

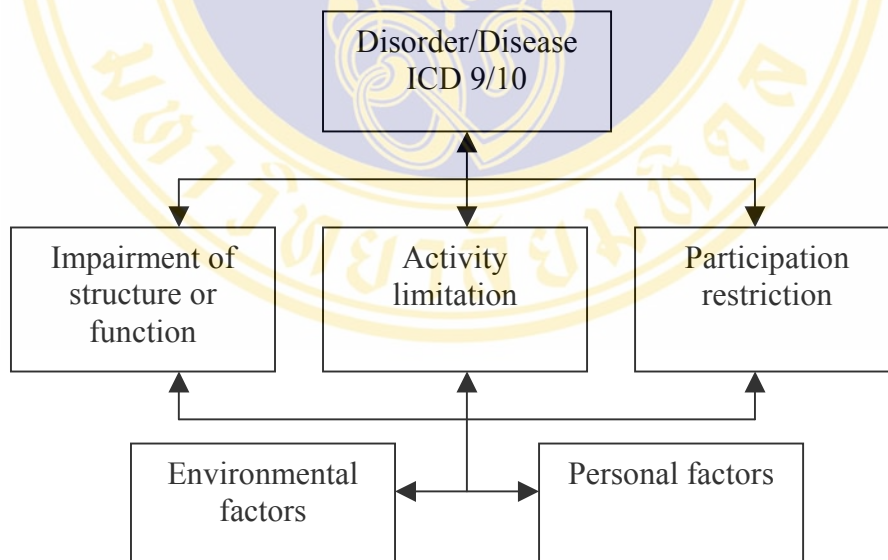


Figure 2: ICDIH-2: WHO framework

2.3 Education system for the blind in Thailand

2.3.1 History of education for children with disability

The history of special education in Thailand as a positive overt activity is a recent history. For most of Thailand's past, the educational needs of disabled people have been ignored and therefore neglected. While there is still much archival research to be done, especially into the activities of Western missionaries in Thailand, the formal education of disabled people lagged a long way behind developments in the west. Beginning in 1939 with the education of the blind were not followed closely by other developments. Due to the interruption of the Second World War and the political upheaval that followed in Thailand. But the 1950s saw the gradual establishment of educational facilities for the deaf, the physically handicapped and finally for the mentally handicapped. Administratively, the education of the disabled was for a long time regarded as an aspect of 'special education', which in the Thai situation referred to the education of all those people who were not required to go to school. They were, like tribal people in the hills, seen as on the margins of Thai society. It was not until 1981 that person with disability received compulsory education on a par with everyone else, 'Special education' now is used in Thailand in the same way as in most places in the world to refer to the education of the person with disability (14).

Most laws and regulations prior to the Rehabilitation Act of 1991 either make no reference to education for the blind or mistakenly interpreted that blind and other disabled children cannot go to school. An example is section 8 of the Primary Education Act 1980 which states that an individual who is disabled or whose parents are disabled, does not have to go to school. Although section 15 of the Rehabilitation Act states that person with disability shall receive education both through special or integrated settings, the law itself could not be enforced as this particular phrase does not allow for any ministerial regulation (2).

Table 5 Some events and mile stones in Thailand Education history

| Year | Event |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1939 | School for the Blind established, Bangkok |
| 1951 | Special Education Division was set up under the Department of Public Education, which is responsible for noncompulsory education: pre-school education , secondary education and Welfare education |
| 1951 | Deaf experiment unit established at Sommanat-woraweehan, Bangkok |
| 1953 | Dusit District School for the Deaf was established, Bangkok |
| 1956 | The first integrated program for blind children into regular school was set up at St, Gabriel's school, Bangkok |
| 1958 | Bedside program for physically disabled were set up in Siriraj, Chulalongkorn and Pramongkutklow hospital |
| 1959 | Education programs for intellectual disabilities were started, Bangkok |
| 1961 | Srisangwan School for the physically handicapped was established, Nontaburi |
| 1964 | The first school for children with intellectual disabilities was established, Rachanukul, Bangkok |
| 1971 | Early intervention program for the hard of hearing children attached to Suan Dusit Teachers College was established |
| 1972 | Secondary education separated from the Division of Special Education |
| 1974 | The first integrated program for the hard-of-hearing children into regular school was set up at Payatai Primary school |
| 1977 | National Education Scheme of 1977 recognized the necessity for organizing special education for disabled and disadvantaged |
| 1979 | Pre-school Education separated, leaving the Division of Special Education to oversee education for the disabled and disadvantaged. The first school for hard-of-hearing children was established, named Choburi School for the Deaf, Chonburi |
| 1991 | Government passed the Rehabilitation of Disabled Persons Act |
| 1994 | Inclusive schools for the handicapped were established (Special Education Schools) |
| 1995 | Special Education centers were established (5 centers) |

Source: Jitprapa Sri-on, A History of the Education of Deaf People in Thailand

2.3.2 First national special education plan

In 1994, the government released the first national special education plan, which led to the establishment of more than ten cross-ability special schools.

Two years after the adoption of the new constitution in 1997, the government passed the National Education Act. In this act, the third paragraph of section ten states that disabled persons shall be entitled to educational media, accessible technology and environment, services and other educational assistance in accordance with the principles and procedures prescribed by the ministerial regulation. Although the Thai government and the society in general are beginning to pay more attention to the matter of "Education for Persons with disabilities", the education for the blind has been in the hands of non-governmental organizations.

There are currently three ways for the blind in Thailand to get education:

1. Attending schools for the blind, now there are only 9 schools for the blinds all over the country.
2. Attending integrated schools, colleges or universities while receiving academic support services from nearby schools for the blind or other type settings that may offer services.
3. Receiving education through the Non-formal Education. This is always the way that adult blind persons get educational opportunities.

The number of the blind children who receive education is between 10-12%, while the survey conducted by TNIB 2001 in reported that among the members of TAB the number of blind members who have received education is about 65.2%, only 43.1% finished universities or colleges. The most important problem of education for the blind in Thailand are the insufficient numbers of Braille and audio text books as well as the lack of educational supports. Now the regulation mentioned above is not working in practice (2).

2.3.3 Educational facilities in Thailand

Under the organization of ‘Foundation for the Blind in Thailand’ following education system is constituted under the royal patronage of Her Majesty the Queen. (15).

The Bangkok School for the Blind

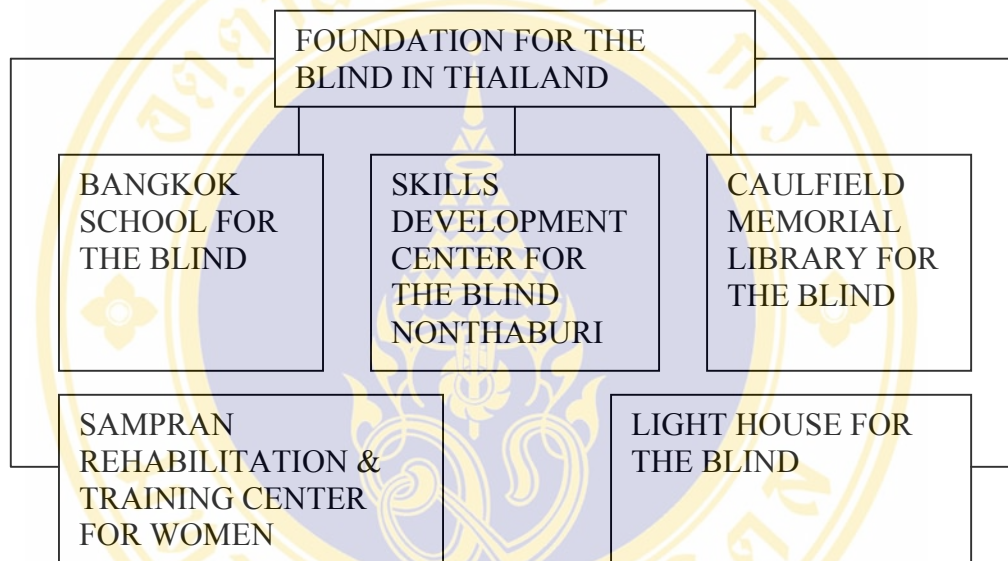


Figure 3: Organization of educational facilities

The first school for the blind, The Bangkok School for the Blind was established in 1939 by Miss Genevieve Caulfield, a blind woman from U.S.A., with the support from several Thai friends of her.

It's objectives are:

1. To provide help and assistance to the blind with disregard to sex, nationality or religion.
2. To educate and train the blind to lead normal lives and become good citizens.
3. To cooperate with government institutions and other non-governmental organizations both locally and overseas to promote activities that will benefit the blind.

The school was registered as a special public school for the blind on 2nd August 1960. The curriculum is divided into various levels: kindergarten, elementary and secondary. Apart from teaching the core subjects as set out by the Ministry of Education, the school also teaches students to learn the necessary ways to adapt themselves into society. The school also promotes physical education, swimming and other sport activities that have been modified to suit blind children. At the same time, students are also taught classes in typing skills both in Thai and English, as well as basic computing. (15)

Assessments of vision and medical intervention (visual therapy) have done with prescription of MD. Cane skill training is started from early grade in elementally school. Outside mobility training is programmed in their 6th grade. Ordinal secondary education is implemented in daytime in ordinal school in Bangkok metropolis as well as special training in the school at night time. There are 252 students in the Bangkok School for the Blind (November 2003).

Foundation for the Employment Promotion of the Blind

Foundation for the Employment Promotion of the Blind, a non-profit organization was established by Pecharat Techavachara and his close associates in July 1993, with the purpose of training blind people for various jobs. Blind men and women from over the country come to the foundation for the following training courses: Traditional Thai massage, Braille, mobility and orientation skills, computer, telephone operators, music and astrology. They also cooperate with Non-formal Education Department and Vocational Department of Ministry of Education conducting special courses. There are five main principal objectives to help the blind receive medical treatment, to help the blind become educated, to help the blind become trained in vocational skills, to help the blind be employed and to work for the public and cooperate with other organizations in public charity (10).

2.4 Situation of employment for the blind

Though the Rehabilitation Act requires employers to hire disabled, there is a definite qualifications for each position that every applicant must have. The minimal education level required is a Certificate in Vocational Education approved by the Ministry of Education. The majority of the disabled applicants does not even meet that minimal requirement. I had to pay visits so many times to both the politicians and the high ranking officials of the Education Ministry to convince them that the Blind need a Certificate in Vocational Education. After one whole year of visits, refers and talks, the General Director of Vocational Department, Education Ministry, accepted the idea and appointed a committee to set up a curriculum suitable for blind students. Basically the students must have 114 credits before they receive Certificate in Vocational Education. Some required courses are not suitable for blind people such as advance course in Accounting. The Blind will not want to be an accountant anyhow (16).

2.5 Factors related to the mobility among the blind

Many QOL related study with blind persons such as VCM1 and LVQOL were performed in developed countries (17), and the result concluded that a strong correlation exists between the severity of the visual disability and the quality of life. However in this study mobility in the life of the blind and association between personal factor and mobility status as well as environmental factor and psychological factor will be focused.

2.5.1 Socio-demographic factors

2.5.1.1 Gender:

A serious understudied area of social development in children with visual impairment concerns knowledge of sex and sexual behavior. Cutsforth (18), Gendal (19), and Scholl (20) discussed the specific problems that visual impairment creates for the child's acquisition of knowledge about physical and behavioral aspects

of sex. However, there is very little empirical evidence about what children know about sex and how they acquire their knowledge.

Females would be more ashamed and try to hide their disability because they worry about their appearance and have more self-criticism in any aspect. Girls had more self-conscience and self-imagination confusion than boys (21).

In terms of adjustment, gender is a factor influencing problem confrontation and a psychological adjustment due to the different ability to ease the pain that is accepted by society as well as different attitudes towards disability. According to the National Mental Health report, women suffered more from every aspect of an adjustment than men. Female was a gender of worry, lack of happiness in the marriage life and tendency to have all kinds of fear. A woman had more development of emotional problems than a man (22).

2.5.1.2 Occupation

The top 5 popular jobs for the blind in Thailand are: government lottery ticket salespersons, masseurs, switchboard operators, fortune-tellers and street musicians, while the blind in rural area always have agricultural work according to Kitipong (2). Unemployment is regarded as a severe problem in terms of income generation, since sufficient financial support from government is not implemented so far.

As far as employment and vocational training are concerned, similar to education, the blind receive services mostly from non-governmental organizations as Rehabilitation Fund for Disabled Persons. It is estimated that, only about 2-3% of the blind all over the country have any kind of job. While TNIB reported that there are about 51.4% among the blind members of TAB have any kind of job, 80% of those can earn less than 71.5 USA dollar per month (2).

2.5.2 History of visual impairment

2.5.2.1 Degree of blindness :

According to the Rehabilitation of Disabled Persons Act 1991(4).

(a) An individual whose better eye, after using regular eyeglasses, is able to see less than 6/18 or 20/70 downward until unable to see any light, or

(b) An individual who has a visual field of less than 30 degrees.

The word "blind" in the term legally blind says very little about the person's ability to "see". This is a special group with very special needs and unique difficulties. Most of us believe that people are "blind" or not blind; they either "see" or "see nothing".

For example, when a partially sighted individual goes shopping and needs assistance with price tags or reading labels, the public deals with them as if they were illiterate. They are very often treated with disrespect, pushed aside by other shoppers and store personnel.

Individuals with partial vision see better at sometimes than others. Some people experience severe vision loss in areas of strong sunlight and often walk into displays or objects along the sidewalk. Other pedestrians frequently assume they are drunk (24).

However awareness of degree of blindness among the blind in Thailand is not high enough to recognize individually in the aspect of medical or ministerial regulation. Even though cause of blindness come up with individual pathology, in this study with regard to the present registration system degree of blind is divided into following two categories, 'Total blind' and 'Severe visual impairment'.

2.5.2.2 On set of blindness

Time on set of blindness is also critical factor, since most of perception of surroundings and body image is integrated within the 5 year after their birth (25).

From the time a blind child is born and especially through the infant, toddler and preschool ages, there must be vigorous support from a team of professionals. A key member of this team is the orientation and mobility specialist. At these early ages, the team is concerned with gross and fine motor development, with gait patterns, with sensory stimulation, with concept development, and with parental (family) support and education (Services provided by Mobility Specialists).

People who are born blind or become blind early in life have no visual experiences with concepts such as colors, distance, depth, or proportion. Falvo (26) explained: Individuals who have congenital blindness because of their lack of visual experience in their environment, such as the observation of tasks or behavior of others, they must learn by other means concepts that sighted individuals often take for granted. This adaptive learning of tasks then becomes a natural part of their developmental process so that the adjustment to visual limitation is incorporated into their self-perception and daily activities as a normal part of growing up. Individuals who lose their vision later in life have the advantage of being able to draw on visual experiences in the environment as a frame of reference for physical concepts, but they may find it more difficult to accept their blindness than those who have never had vision.

The congenital disabled usually had less daily life experience, social roles and social and environmental incidents than the acquired disabled. These were crucial for self-concept development.

However, Alfafano, Nisen, & Fink (27); Krause&Crew (28); Schulz& Decker (29) mentioned that the earlier the age of onset, the better the response and adjustment. While this is not always true, it has been found that, for example children with congenital limb deficiencies adjust better than children with acquired amputations and children whose diabetes is diagnosed early adapt better than those who are diagnosed with diabetes later in life. This may be due to several factors: (a) the cognitive and affective resiliency and flexibility of children; (b) the fact that

there are no premorbid identity or functional losses; (c) children have not fully developed their body image. Children can be resilient and accepting of disability, able to learn medical self-management technique and other adaptive strategies that are appropriate to their developmental level.

2.5.2.3 Duration of blindness :

Any creature has their own ability to adapt themselves to their surroundings. So duration from their blindness have some role on adapting themselves to the given internal and external situation.

Human nature needs time to adapt itself to something. Beside the longer the time the better the better self-care ability improvement and self-confidence to perform activities of the disabled becomes. These things have a good result on relationships between a person and participation society (22).

Duration is a crucial factor for an adaptation because human nature needs time to adapt itself to something. Being given some time can make the patient feel confident in the treatment and conformity.

2.5.3 Environmental factor

2.5.3.1 Guideline of effective intervention for mobility

Loss of physical and mobility freedom is very important to persons with visual impairment. Not only it deprives them of their ability to move around their homes and communities, but also takes away their opportunity to work which can seriously create psychological problems. Without O&M training, children with congenital visual impairment may not be able to develop their concept as usual and may not truly understand the world around them (8).

O&M training is essential training to bring the blind to the environment. The training helps children's development skills as well. A good environment familiarization begin with developed sensory awareness to enable

children with visual impairment to determine their “mobility” mind map to replace the use of their visions. Their minds must contain images displaying topographical maps and kinetic images. These can only be developed once they have practiced walking through space. The more movements and practice they make, the more the route appears in their minds. O&M should be combined into one subject along with perceptual skills, concept development, motor development, and awareness of environments. The community should also understand the O&M teaching procedure in order to support the program.

Richard Hoover and his staffs established O&M curriculum in U.S. in 1945. Since then, it has been developed and applied to serve the needs of many countries. For instance, in U.S., England, and Australia the course is designed in one-year, while in Asia there are differences within the contents and time period of the course. Mostly it is as 18-month course and 100-day intensive course (1999). In Indonesia and India, the 4-month course is offered (American Foundation for the Blind, 1998). At present O&M method and teaching is expanding and developing all over the world. Following category is the guideline of intervention for mobility in AFB.

Early assessment and intervention

From the time a blind child is born and especially through the infant, toddler and preschool ages, there must be vigorous support from a team of professionals. A key member of this team is the orientation and mobility specialist. At these early ages, the team is concerned with gross and fine motor development, with gait patterns, with sensory stimulation, with concept development, and with parental (family) support and education.

Cane skills training

Special long canes are designed for blind individuals. These canes are used in a variety of ways to keep travelers safe while moving. The long cane is a remarkable

tool with a wide variety of uses. Mobility specialists work long and hard to help students develop good cane technique.

Sensory awareness training

This involves stimulating the non-visual senses (also residual vision), as well as teaching auditory, tactual and kinesthetic discrimination and localization. This training is both clinical (indoors, simulated) and practical. For example, in actual settings, such as at a street crossing, students are taught proper use of residual vision (what to focus in on and what to ignore), listening skills, and strategies for making safe and efficient decisions based on careful sensory monitoring of the real world.

Skellenger and Hill have suggested some idea on how to assist young children and children with severe multiple impairments “To become aware of, tolerate, and discriminate the sensory messages they receive before they will be able to make cognitive use of this information to assist travel. It is important that sensory information be verbally pointed out to the child and that the child be actively involved with visual, tactile, auditory and olfactory information which they will later experience and utilize during independent travel.” (7)

In order to develop the sensory awareness into independent mobility, it requires an integration of visual abilities and other residual senses. O&M instructors should focus on how to make them more alert and have their concept and interest gathered (8).

Teaching environmental manipulation (learning to control personal space)

Vision is enhanced where there is adjusted illumination, and where contrast is high. Visually impaired persons can be taught to wisely manipulate lighting, and to design their surroundings (rooms, desks, outdoor areas, work areas, etc.) to deliberately produce high contrast. Mobility instructors can be environmental consultants for students and families.

Teaching about the vision system (and systemic problems)

Another role of the mobility specialist is to assess a student's vision system, and then interpret functional problems that can occur (and for which adaptations must

be made). This interpretation of a student's damaged vision system must be presented in layman's language to the student, parents, care givers, and teachers. The effects of systemic problems (genetic syndromes, for example) and drug therapies, on vision processing is also a role that can be assumed by the O&M specialist.

Often during elementary school, blind children come to the realization that they are different from their sighted peers. Some children have difficulty accepting this. A referral is usually made to appropriate psychological professionals. The mobility specialist, as a positive role model, can assist with the transition and acceptance process, as can older blind students and blind adults.

Visual therapy

Various forms of visual therapy can be administered by mobility instructors. Since this often involves complex theory, the therapy is carried out under the direction of an optometrist or ophthalmologist. Some forms of visual stimulation, and certain training exercises are simple, and can be done without direct monitoring by a health care professional.

Teaching daily living skills

Children with severe impairments often do not get sufficient opportunities to experience the community independently. They are led or directed through the world, and consequently do not develop the skills needed to survive on their own when they reach maturity. Mobility specialists place students in the real world and give them practical problems to solve. Students are required to shop, use the telephone, arrange transportation (use public buses, subways, and trains). They are required to locate restaurants: find a table, order food, eat it, leave a tip, pay the bill and handle all money transactions. They are required to use the post office, banks, airports, libraries, hospitals, recreational centers, theaters, grocery stores, malls, and so on. They are required to find their way around residential neighborhoods, business areas, suburbs, rural areas, and massive downtowns. In short, the overall goal of the mobility specialist is to help students become as independent as sighted peers.

Daily living skills are those routines that most sighted people take for granted. Making eye contact, using gestures and body language, asking for help, eating food without spilling, looking in a mirror to see if hair is in place or if mustard is on the cheek, managing time and money, using public bathrooms appropriately, all these and more can be a major challenge if blind trainee cannot use vision. Mobility specialists are part of the educational team that teaches daily living skills.

Teaching advanced mobility skills

For students who are capable, advanced skills are addressed. The goal of the mobility specialist is to teach blind students to self-familiarize themselves with the world. The advanced blind traveler is able to travel to a novel location and successfully envision and navigate through an unfamiliar location. The competent blind traveler also can keep good computerized (or well organized) notes (data bases) about his or her community. The advanced student can question others to gain knowledge that is relevant to his or her mobility needs. Advanced students are also proficient at reading Braille maps and able to handle complex transportation depots. They have strategies for dealing with intrusion. The competent blind traveler belongs to one or more consumer groups and has strategies for staying abreast of social, legislative and technological issues. These strategies include the ability to access databases over the information super highway and to communicate with others electronically. The advanced visually impaired student may take drivers training and be skilled at using spectacle mounted telescopes.

2.5.3.2 O&M course in Thailand

The first O&M Training in Thailand took place under the cooperation between Department of General Education, Ministry of Education and Christoffel Blinden Mission (CBM), Germany. It aimed at offering mobility skill to children and adults with visual impairment. Before the settlement of the training, the conference had been held by the Drafting Committee composed of CBM Asia Regional officer, representative from foundations and associations for the blind in Thailand, and representative from Department of general education. The conference took place in

1983. It agreed that CBM would provide financial support to send two Thai instructors to be trained on O&M, organized by Y.M.C.A and CBM, for four months in India . Once they were back, they were to work as O&M training specialists.

Latter in 1984, CBM urged the Special Education Survey Unit, Department of General Education under Ministry of Education to conduct O&M training for the first time in Thailand. The 13 participants were selected from special education instructors, education supervisors, and trainers from across the country. (American Foundation for the Blind, 1988) 1988, the completed version of O&M Training Handbook was published and distributed to people concerned for the first time in Thailand. It described the methods of training persons with visual impairment on how to travel with the Sighted Guide Techniques and the White Cane Technique.

O&M training in Thailand today, personnel who work with the visually impaired pay very careful attention to the Sighted Guide Technique and pay brief attention to the White Cane Technique, but O&M instructors focus on these two topics in detail as they are the most suitable for Thai economy, society, and geography. Currently Dogs Guide Technique and Electronics Travel Aid Technique training have not yet been implemented due to financial problems in terms of misallocation because such electronic devices are expensive and still under the trial even in developed countries. Shortage of guide dogs for blind person is also be a problem in developed countries.

Meanwhile each method and principal mentioned above requires specific practice and techniques that must be learned, it is very important that persons with visual impairment learn these techniques. The ultimate goal is to help them gain safe and independent access to both familiar and un familiar environments in the most graceful and natural manners.

At present, agencies or O&M training institutes in Thailand offer O&M course for O&M instructors and provide O&M services to the visually impaired. Rajabhat Institute Suan Dusit, for instance offers a program in Special Education.

Faculty of education has been offering O&M Program for undergraduate students majoring in Special Education and minoring in Teaching Persons with visual Impairment since 1986. The course contents have been improved periodically.

Apart from Rajabhat Institute Suan Dusit, Ratchasuda College at Mahidol University has also included O&M in the graduate program in rehabilitation service for persons with disabilities. The program is divided into O&M1 and O&M2. Contents of the first course contain O&M philosophy, history of O&M, characteristics and types of persons with visual impairment classified by medical aspects, Usage of Sensory Awareness, Pre-Cane skill, Sighted Guiding technique for Persons with visual impairment in Different Situations, Soliciting Aid, Accepting and Refusing Aids, Protection Techniques, White cane Technique, Indoor and Outdoor cane Techniques, Cane Techniques to Avoid Obstacles, Using Public Transportation, Traveling in Public Places and Community, as well as Self-help skill or Activities of Daily Living.

O&M2 previews the contents of O&M1 and adds some contents on Familiarization with the Room and Building, Knowledge about Low Visions, Recreation Activity for Persons with visual Impairment, Street Crossing, Avoiding Obstacles, Independent Travel in the City, Modified Cane Techniques to Solve Problems while Traveling, Usage and Producing of O&M Media and Equipment, Independent Traveling in Rural Areas, Teaching Planning, and O&M Practicum for Children with Visual Impairment (21).

2.5.3.3 Social support concepts

Social support definition and dimensions

Although social support has been widely reserved, no single definition of this concept has been emerged. Cobb (30) has defined social support as information leading individuals to believe that they are cared for, loved, esteemed and valued and belong to network of communication and obligation.

Kan and Antonucci (31) defined social support as interpersonal transactions that involve the expression of positive affect, the affirmation or endorsement of person's beliefs or value and provision of aid or assistance.

Walker, Macbride and Vachon (32) have defined social support as behavior that assures people that their feelings are understood by others and considered normal in the situation. They indicated that social support refer to a variety of materials, information, advice and emotional supports a person received from others (33).

In terms of benefit and functions of social support, many researcher have typically grouped potential functions into three categories: Tangible assistance, information and emotional support (34).

Instrumental support

Instrumental support or tangible support provide direct aid in terms of loan, service. This kind of support may decrease stress by directly solving problems or by increasing time for relaxation or entertainment. With regard to the travelling of blind helping them to get on/off the vehicle, giving them their hands when they are walking across the street and going up stairs at public places were considered to be tangible support by society, while to accompany with

Emotional support

Emotional support makes people reassurance with a sense that they feel valued and esteemed. People get esteem and other kinds of support from close and confiding relationship. These relationship will give them reassurance that they are cared for and loved (35).

Information support

Family, relatives and other significant people can provide information support by suggesting specific actions that individual can take to fight with stressful events. Information can help people recognize the problem and cope with it more easily.

2.5.3.4 Current movement of transportation toward blind in Thailand

Even though in 1998 ministry of regulations regarding accessibility was proclaimed, social consciousness of accessibility in Thailand is still low. Especially for blind and people with locomotive disability transportation is still crucial problem, service of underground and street train is not started and train is mainly for purpose of long journey. In addition to that high steps at the gate of train and buses in which drivers are usually not kind enough to facilitate disable person to get on safely are disturbing their mobility. In Bangkok way for pedestrian is heightened in order to prevent water flooding in time of heavy rain. In rural area road without pavement make sand dust when cars are passing through and easily change muddy when it rains.

Even though Skytrain (BTS), which start operating in 1999 provide elevator service in some stations but soon it was closed and locked since poor accessibility for the station and expensive fare, prevented the utilization of the transportation for person with disability. Four public buses with lift service have started working in Bangkok metropolis but it is said to be a phase of trial (1).

2.5.3.5 Current situation of transportation for general population in Bangkok

Table 6 Distribution of Work-Study Trips by Travel Mode in Bangkok

| Walk/Study Travel Mode | % n=306 |
|------------------------|---------|
| Private car | 46.1 |
| Buses | 37.6 |
| BTS | 5.6 |
| Taxi services | 2.6 |
| Walk | 4.2 |
| Others | 3.9 |

Source: Angkana Chairatananon; Bangkok Transportation analysis, college of Architecture and Urban Planning University of Michigan (2002)

According to the study of Angkana Chairatananon (36), respondents in Bangkok metropolis were asked several questions concerning their travel behavior. For their trips to work, 46.1% drive their own cars to work every day, while 37.6%

are regular bus riders. 5.6% take rail transit to work. 4.2% walk and 2.6% use taxi or motorcycle taxi services and 3.9% travel by other mode.

According to Thai Farmers Research Center, the total road length in Bangkok in 1995 was 3,800 kilometers. But the number of registered vehicles in the same year was estimated at 3 millions. This number if multiplied by 4, which is an average length of a car, will total 12 million meters, or about three times greater than the total roads in Bangkok combined. It may be argued that people in general travel in different times of the day. But this clearly indicates that road capacity in Bangkok can accommodate only one-third of its vehicles, which is considered quite low. Moreover, since Bangkok is still a highly centralized city, the majority of trips tend to be attracted towards the inner areas of older and narrower streets, thus directing heavy traffic to be focused densely on certain areas (36).

From the survey data, 37.6% of Bangkokians ride buses to their workplace. Even though 50% of Bangkok residents live within 5 minutes of bus access and 75% within 10 minutes, according to the Bangkok Mass Transit Service (BMTA), which is the main bus operator in Bangkok, riderships is still declining each year (37). Despite the efficiency that transit services promised, riding buses in Bangkok consumes even more time than being stuck in private cars. On average, it takes about 40 minutes to drive to work. But when riding a bus, it can take up to about 60 minutes. When looking at people who drive, they travel even at a longer distance of about 22 kilometers (13.67 miles) on average but bus riders travel at about 18 kilometers (11.18 miles) to work. This mean that on a trip to work in general, cars travel at the speed of 33 km/h (about 20.5 mph), compared to 18 km/h (11.18 mph) of buses. Since buses are a less convenient mode, people consequently prefer sitting in an air-conditioned private car, when affordable, to standing in the middle of a fully packed bus. Buses in Bangkok share the same congested roadways as the general traffic, and they have to stop for passengers at bus stops (38).

2.5.3.6. Comparison Study of support from GO, NGO and private sector for person with visual impairment between Japan and Thailand

Table 7 Comparison Study of support from GO, NGO and private sector for person with visual impairment between Japan and Thailand

| Type of support | Support provided both Japan and Thailand | Support provided only in Japan |
|----------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Technical Aids | White cane, glasses | Braille writer, artificial eyes, spectacles |
| Provision of Daily Living Appliances | | Braille type writer, watches (Braille, talking), cassette tape recorder, acoustic traffic signal detectors, electro-magnetic cooking utensils, compasses, talking pedometer, melody guide, talking thermometer, talking weight scale, closed circuit TV |
| Reduction of Exemption from Taxes | | Income tax, Consumption tax, Inheritance tax, Business tax |
| Reduction of Public Transportation fee | Domestic airplanes, | Railway line, Public buses, Taxis |
| Reduction of Public fees | | Television fee, Telephone service |
| Reduction of Public fees | Library for the blind, Braille magazines, Radio program, | Braille newspaper, Talking books, Talking magazines, Braille election bulletin, TV program, Internet |
| Right for access | Sighted guide volunteer, | Guide dogs, guiding/ warning tiles, Acoustic walk signal, Tactile Ground Surface Indicator, Guiding Chimes, Hand rails |
| Others | Information board (Tactile board), Discount ticket for parks, zoos, museums | Home helper, Pension scheme (Basic Disability Pension scheme), Special Allowance for severely disabled people, Postal service |

Source: Persons with visual impairment in Japan 2003: National Committee of Welfare for the blind in Japan: International committee Japan Federation of the Blind, with report of Ratchasuda college, Mahidol University.

Government, municipalities, private company and NPO in Japan provide following services by partial or entire subsidization from fund, of which available service and not available service in Thailand were distinguished in table(39)

After 1991 equipment for all person with disability by ministry of regulation under the Rehabilitation Act was proclaimed and services for person with disability was proclaimed by the ministry of regulation 2001. Consequently several fund was established to facilitate technical aids, provision of daily living appliances, reduction of exemption from taxes, reduction of public transportation fee, reduction of public fees, reduction of public fees, right for access and so on.

2.5.4 Psychological factors

2.5.4.1 Consideration of individual's Environment

Shontz (40) emphasized that reacting to a disability is not only a response to a physical, intellectual, cognitive, or psychiatric impairment, but also includes other factors in the individual's environment. Factors such as economic security, educational level, family support, and availability of treatment influence the disability experience. Therefore, Shontz argued that clinicians and researchers should include environmental resources rather than simply focusing on the psychodynamics of the person with disability.

The factor that has not been fully addressed in the individual's response to the disability concerns the degree of prejudice, discrimination toward the type and severity of disability, and if the individual is also subject to prejudice or discrimination because of other perceive identities, such as belonging to other cultural/ethnic/racial groups, being a woman, being older, or having a different sexual orientation (41). Certainly, the degree of stigma and prejudice the individual experiences will influence his or her response to the disability.

2.5.4.2 Social and Emotional Development

Social and emotional development is also very important. If children with visual impairment are to achieve satisfaction as human who is

sorrounded by people and to feel that they are accepted in the society of this world, their social and emotional development must be reflected in three ways, from the children themselves, from what their parents see, and from what others see in them (21).

Relationships between children with visual impairment and others influence their social and emotional development as well. If their communities see them as something pitiful or shameful, they easily absorb these images. Parents of children with visual impairment may behave variously to allow their children's social and emotional maturity. For example, they can help their children with the decision making simply by telling them what should or should not be done. This is because disability tends to give them some excuses not to try new experience. Their parents can help them learn the directions around them, learn to find clothes in the wardrobe by themselves, learn how to eat alone, and socialize with friends from school and outside of school. These kinds of assistance enable them to achieve their goals by using their touch instead of eyesight. Although children with visual impairment need their parents' protection, it should not prevent their freedom to do things on their own.

2.5.4.3 Individual's adaptation

An individual is an adaptive system composing of bio-psycho-social being. It works harmoniously together in unity and goes on with purpose. Roy believes that human nature is an open system having an interaction with an individual's internal and external environment at all time. Therefore, an individual needs to adjust himself to it. An individual adaptive system includes input, control process, effectors, output, and feedback mechanism.

Input can be concluded that an adjustment to the changing situation of an individual depend on the impact of stimuli. Control process provokes an individual's adjustment. There are two coping mechanisms, which are regular mechanism and a perception mechanism. When stimuli occurs an individual will have two types of an adjusting mechanism, which are a regular mechanism and a

perceptive mechanism that work together to maintain physical, psychological and social stability. The results of these two mechanisms will be shown through four aspect of an adjusting behavior. They are a physical adjustment, a self-conceptual adjustment, a role and functional adjustment, and an independent adjustment.

Output is an output of an individual system and an outcome of an adjustment. A good adjustment is an adjustment that can achieve the growth purpose, survive to generate, and conquer any obstacles. But if that adjustment fails to achieve such a purpose, it's considered a poor adjustment, and an interdependent adjustment (42).

2.5.4.4 Souse of prejudice and discrimination

Disability has been present in all societies in the world throughout history. In spite of the long history and the universality of disability, almost without exception, people with disabilities have been discriminated against; with that discrimination ranging from minor embarrassment and inconvenience to relegation to a life of limited experience and reduced social opportunity and civil rights (43).

In reality , there is no clear demarcation between society's perception disability and the individual's adjustment to his or her disability because the individual internalize a great deal of society's judgments and reactions to the disability (44). For anyone, with or without a disability, society contributes to the individual's sense of self. Perceptions of disability levels, expectations of people with disabilities, and ascribed meanings of the experience of disability are all shaped by the border culture. Of course, the degree to which society shapes the identity of the person with the disability depends on several factors and not all individuals are equally affected by the society's judgment.

Julie (43) also relate that the three responses to persons with disability from society such as Charity, preferential treatment, compensation are all based on the inherent inferiority of the individual. That is to say, in order for an

individual to receive charity, preferential treatment or compensation, he or she must first be declared inferior, subordinate, and needy. Of course, most would be quick to add that the inferiority of the individual is due to a process of nature (the on set of the disability) for which the individual is not responsible. In spite of this, inferiority is the basis of the entitlement.

2.5.4.5 Measurement and instrument of intra-individual personal factor

Disability scholars have used the terms adjustment, adaptation, or acceptance of disability to describe the end result of coping with a disability and successfully integrating the disability into the individual's life and identity . In the early stages of scholarship, adjustment to disability was conceptualized as a series of stages through which the individual passed, ending with acceptance of the disability. The current model of coping with a disability uses the term the individual's response to disability (45).

Even though there were many types of responses or adjustments to disability in addition to the psychological adjustment, including occupational and social adjustment or response, in this study researcher focused on Lifestyle & Behavior Changes, Psychosocial Attributes & coping and Activity Accommodations.

Disability scholars (Anson, Stanwyck, & Krause; (46)), (Krause, 1998; Krause, Coker, Chalifur, & whiteneck, (47)) have begun to incorporate measures in many aspect of disability. For instance, psychological adaptation (or maladaptation) has been operationalized as (a) presents new and distressing physical, behavioral, and psychosomatic compliments (General Health Questionnaire, Millon Behavioral Health Inventory and Sickness Impact Profile); (b) the alteration of vocational and avocational productivity (psychosocial Adjustment to Illness Scale); (c) reduction in performance of domestic activities or daily living skills (Psychosocial Adjustment to Illness Scale and Sickness Impact profile); (d) coping style (Millon Behavioral Health Inventory); (e) degree of disability acceptance (Acceptance of Disability Scale and Acceptance of Loss Scale); (f) pathological dimensions of

personality that influence the course of disability or the efficacy of treatment (Millon Behavioral Health Inventory); (g) impact on interpersonal relations, communication, and sexual behavior (Psychological Adjustment to Illness Scale and Sickness Impact Profile); and (h) emotional and psychological distress, as manifested by the reasons of anxiety, shock, guilt, depression, anger, hostility, and denial (Heinmann and Shontz Q-sort and Reactions to Impairment and Disability Inventory (48)).

In the aspect of “normative” and focus in the study outcome of mobility the precise measurement of each domain is beyond researcher’s interest in this study. However there are adjust demands for blind individuals.

Generally speaking, response to a disability can be divided into three categories: cognitive, behavioral, and affective. Cognitive means thinking or how one chooses to view (or to think about) the disability. A positive or good cognitive response to disability include redefining reality rather than ignoring it or denying it. Behavioral response to disability include active mastery of the disability, compliance with treatment regimens, seeking out social support, returning to work, and, for many activities fighting against the stigma and prejudice of society. Affective response means how the individual feels about the disability and how he or her coping responses as neatly divided into these three categories. Behavioral acceptance/response to disability is relatively easy to operationally define and measure. Cognitive and affective responses are more difficult to measure.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Study design

The study design is a cross-sectional study and designed to identify the factors which limit or restrict the mobility among the blind who are living in Bangkok metropolitan. With multiple choice questions measurable factors are described and analyzed as quantitative data and with open-ended questions immeasurable opinions for difficulty of free mobility and requirement of the blinds for society and government are explored and discussed.

3.2 Study population

The population for this study is the people aged ≥ 20 years old and living in Bangkok metropolitan more than a half of year prior to the date of interview. The reason for choosing this age group is due to the assumption that all have finished secondary education and at least not receiving protection by staying dormitory or facilitated by school bus when they go out from resident. In the other words the study population tends to be exposed to the same environment as those general population who are without disability.

With regard to other health related impairment classified by WHO as following 9 categories (13): Intellectual impairment, other psychological impairment, language impairments, aural impairment, ocular impairment, visceral impairments, skeletal impairments, disfiguring impairments and generalized, sensory, and other impairments, those who have only visual impairment are recognized as the target group.

3.3 Sample and sampling technique

The people with visual impairment who are currently living in Bangkok more than 6 months and aged equal or more than 20 years old and purposively selected based on the places where they are living together or may joy together in an occasion of the blinds' meeting.

3.4 Place of data collection

Table 8 Place, date, and number of data collection

| PLACE OF DATA COLLECTION AND DATE | CHARACTERISTIC OF POPULATION | NUMBER OF POPULATION |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------|
| Thai National Institute for the Blind (Thai Association for Blind) 5 th Jan to 18 th Jan 2004 | client in lottery office Staffs or volunteer of institute | 43 7 |
| Crawfield Foundation Center for Blind 9 th Jan 2004 | Masseur and Masseuses | 10 |
| Bangkok School for Blind 13 th Jan to 18 th Jan 2004 | Teacher and Staffs | 5 |
| Periodical meeting of male blind held at Wat Chonprathan Ransit, Nonthaburi Province 24 th Dec 2003 | Participant | 50 |
| Periodical meeting of woman's club held at Bangkok school for blind, female participant and male volunteer 18 th Jan 2004 | Participant | 24 |
| Daukanong congested area 10 th Jan 2004 | Residents | 29 |
| Door to door interview 7 th Jan to 22 nd 2004 | People who does not belong to any kind of association or organization above | 5 |
| Total | | 173 |

Places of data collection were localized as follows purposefully where sample was collected by chance. To meet less active cases door to door interview also performed in order to obtain mobility related answers from another point of view.

3.5 Research instrument for data collection

The research instrument used in this study is an interview questionnaire, which consists of 5 parts totaling 71 close-ended questions and 4 open-ended questions. Details of each part are presented as follows:

Part I Personal factors and history of visual impairment

This part includes 12 questions asking toward socio-demographic characteristics and history of visual impairment of the respondents as follows: age, sex, occupation, education level, frequency of fall and injury, onset of blindness, duration of blindness, diagnosis (Grade of impairment).

Part II Mobility status

This part consists of 2 main parts: physical mobility and functional mobility. Physical mobility was measured by frequency of going out and average time of walking in a day. Mode of transportation, average time of travelling for working place also were asked in this part. There are 21 questions in the part of functional mobility as accessibility to following public facilities, department store, market place, buffet, governmental office, hospital, post office, barber or hair dresser, Council of Welfare Office and Thai National Institute for the Blind. Among the partial blind (low vision), the accessibility were asked only when they came alone, while among those total blinds interviewee were asked about the accessibility both alone and with sighted guide.

Problem of difficulty at boarding and perception of fare for answered transportation were asked in order to assess the situation of transportation among the

blinds. The following are the 3 choices from which respondents can choose their answer. The statements are categorized as follows:

- 1 = Easy
- 2 = Not decided
- 3 = Difficult

Part III Environmental factors

In this part questions are divided into two parts as social support from family and society and impacts of O&M training.

Degree of support as a positive human relationship such as instrumental support, emotional support and information support are asked based on 5 rating scales as presented below. Among negative statements; scores were as follows while among the positive statement, the rating scores are vice versa.

- 1 = Strongly agree
- 2 = Agree
- 3 = Not decided
- 4 = Disagree
- 5 = Strongly disagree

Knowledge of O&M training was asked by 1 = Yes and 0 = No

To identify what kind of training or medical intervention they have got previously, dichotomous answers were designed.

- 0 = not experienced
- 1 = experienced

Whether they were instructed by family or community at preschool age also be asked by 1 = Yes and 0 = No.

Part IV Psychological factors

Questions in this part were designed with 7 question, which were answer by following choices. For negative statements the scores were as follows:

1 = Strongly agree for negative statements

2 = Agree

3 = Not decided

4 = Disagree

5 = Strongly disagree

Part V Motivation factors for mobility and requirement from government

Well-trained interviewers asked the motivation to go out from home when the interviewee is recognized as an active person, and the reason why they preferred to stay at home was asked when the blind was recognized as an inactive case.

In addition the interviewers also asked the requirements of the blind toward Thai government and government policy to improve their mobility while travelling outside at the last part of this questionnaire.

3.6 Pre-test

Six volunteers of lecturers and staffs from Rachasuda college, Mahidol University were interviewed with the original questionnaire. Improper questions and rating scores for some parts of the questionnaire are revised under the close supervision of the thesis advisors in order to have more content validity.

3.7 Data collection procedure

The interviewed questionnaires are used to collect information from the respondents in each place.

The data was collected from the respondents by face to face interview under the close supervision of the researcher. Questionnaire, which was translated from English to Thai, was used by the Thai interviewers.

3.8 Data analysis procedure

Data analysis is divided into 2 parts: descriptive statistics and inferential statistics as follows:

1.Descriptive statistics

Personal factors such as socio-demographic factors, experience of fall and injury, history of visual impairment, environmental factors, psychological factors, mobility status such as physical mobility and functional mobility are described using frequency, percentage, median, first and third quartile.

2.Inferential statistics

For analytical part, the relationship between personal factors, history of impairment, environmental factors and psychological factors and mobility status were analyzed using Chi-square, Spearman rank correlation, Mann-Whitney test and Kruskal-Wallis test. The confidence level for this study was set at 95%.

CHAPTER IV

RESULTS

Data collection of this research was conducted among persons with visual impairment aged equal or more than 20 years old, who have been collected based on the purpose of study varied according to the places of study mentioned in chapter III. Time period of data collection was from December 24, 2003 to January 22, 2004.

With regard to other health related impairment classified by WHO as following 9 categories: 1) Intellectual impairment, 2) Other psychological impairment, 3) Language impairments, 4) Aural impairment, 5) Ocular impairment, 6) Visceral impairments, 7) Skeletal impairments, 8) Disfiguring impairments and 9) Generalized, sensory, and other impairments, only who have visual impairment except for minor musculo skeletal insufficiency due to aging were observed under this study.

The findings are summarized into 6 parts as follows:

PART I : Mobility status and motivation factors

PART II : Socio-demographic factors

PART III : Environmental factors

PART IV : Psychological factors

PART V : Relationship between socio-demographic factors, environmental factors, psychological factors and mobility status.

PART VI Qualitative data:

4.1 Mobility status

Among variables studied in this research, the following three variables were used as an outcome variable to indicate the mobility status among the blind.

- 1, Frequency of going out from home
- 2, Average walking times
- 3, Accessibility to public facilities

Table 9 Mobility status of the blind

| Mobility status | n | % |
|----------------------------------------------|-------|-------|
| Frequency to go out (times in a week) | n=171 | |
| 0 | 16 | 9.33 |
| ≤ Median score (1-7) | 131 | 76.61 |
| > Median score (>7) | 24 | 14.02 |
| Median = 7 Min = 0 Max = 22 | | |
| Average walking time (minutes) | n=170 | |
| 0-30 | 29 | 17.06 |
| 30-60 | 24 | 14.12 |
| 60-120 | 26 | 15.29 |
| 120-240 | 31 | 18.24 |
| 240-480 | 44 | 25.88 |
| >480 | 16 | 9.41 |
| Median = 165 Min = 0 Max = 900 | | |

4.1.1 Frequency to go out (times in a week)

Almost half (46.8%) of respondents went out from home once a day. A few (14%) of blinds go out more than 7 times a week, while some (9.4%) of them did not go out from their house even once a week. The mean frequency was 6.30 (SD = 3.74) and median was 7. The reasons why they went out for or why they stayed at home are summarized in table 7 and 8.

4.1.2 Average walking times

Regarding to average walking times out of 170 valid answers ranging from 0 min to 900 min which showed mean average of walking time among blinds equal to 221.0 min/day (SD = 195.2) while median time was 165.0 min/day. Some of them (17.1%) spent time less than 30 minutes a day while some (13.4%) walked more than 10 hours a day.

Table 10 Motivation factors of going out of home

| Motivation factors | % n=155 |
|-----------------------------------------------------------------------|--------------------|
| 1 Go for work to earn money | 73.5 |
| 2 To meet friends | 25.8 |
| 3 To travel around in Bangkok or outside Bangkok without any purpose | 14.8 |
| 4 To keep contact with society and serve for it | 10.3 |
| 5 To study in school, as vocational training or participating seminar | 7.1 |
| 6 To gain more new life experience | 6.5 |
| 7 For shopping | 4.5 |
| 8 Do not want to stay home and do not want to be a burden of family. | 3.9 |
| 9 To go to government office or TNIB to do some procedure or business | 3.2 |
| 10 To have some food | 2.6 |
| 11 To find job | 1.9 |

Table 10 is summarized reasons influencing the blind to go out of home. The first main reason to go out of home was to go for work to earn money. Their motivation to keep working was varied as follows; to be economically independent from family, to take care of children, to play role as a constituent of society, to buy daily necessities such as food, clothes and commodities, to buy own car and own house.

The second main reason to go out from home was to meet with friends or relatives, which not only mean the needs for talking and keeping in touch but also exchange information to promote their life. The purpose of meeting varied from just chatting, discussing, business contacting participating recreation or activity.

Travelling without purpose was the third leading cause of the motivation. Reason why travelling was highly thought of by the blinds and was suggested by

some comments like “require same life style as general people”, “be in freedom in terms of mobility”.

Some need long distance travelling to several provinces for business, while majority of blinds who replied this answer told it was good for refreshment of feeling. It might mean travelling is not only the means to transfer from place to place and it could be the purpose of their life related activity.

The forth reason was to keep contact with society and serve for it. Most of them indicated to take part in several activity, club and meetings would enable them to create the senses of belongings. Desire to serve for society with in the limitation of blinds’ potential was also stated. In another word, adjust oneself to social life in terms of independence and social responsibility (in public sphere) as well as individual responsibility (in domestic sphere) was their concern.

Beside the concrete reason like job, study and vocational training was also imminent needs for the blind to seek for better life. This reason ranked as the fifth order for motivation factor to go out of home.

Contrary to concrete basic needs, high hierarchical basic human need as exploration of life was observed as a strong desire. Needs to learn for the worldwide change and seek for a life experience, desire to know the changing event in the world were observed as the sixth reason to go out of home.

For the other reason, it can be summarized as followings. In consideration of some advantage they just do not want to stay home. From the statement “Do not want to stay home and do not want to be a burden of family.” Strong willing of independence was observed.

To go to government office and TNIB were considered to be a basic need among the blinds' life as well as the shopping and to have some food since some are receiving some amount of commission of selling lottery at TNIB.

Other minor reasons were composed of: to see a medical doctor, to go to a post office, to go to a bank, to play sports, especially to swim, because he is the paralympic game swimmer, to see a concert, to provide a seminar and to work as a volunteer in several institutes.

For the blind those who were recognized inactive by interviewers the reasons why they prefer to stay at home were asked with the statement "What are the reasons why you prefer to stay at home?"

Firstly of all difficulty on travelling in a real situation was observed as a limiting factor of mobility among the blind, which affected on the blind's life both physical and psychological aspect. Especially 6 respondents claimed the inconvenience of utilizing public bus.

Table 11 Inhibition factors of not going out of home

| | Inhibition factors | % (n=15) |
|---|--------------------------------------------------------------------------------------------------------------------|---------------------|
| 1 | Uncomfortable to travel around Bangkok especially to get on and off public bus is difficult | 60.0 |
| 2 | Stay with family is more safety and feel sympathy and do not want to contact with society and prefer to stay home. | 53.3 |
| 3 | Family or relatives do not want blinds to go out | 33.3 |
| 4 | Need more independency but can not get it | 13.3 |

Secondly, respondents mentioned that the advantage of staying home by suggesting the unnecessary of guide person, safety from any kind of accidents, preference of close relationship with family in terms of warmth and sympathy,

emotional peace at home and availability of private space to keep own privacy. One respondent mentioned “Want to have more time to spend with family”.

Attitude or perception of parents towards the blind was considered to be a strong determinant in activity or mobility especially among the inactive blind. Following statements were collected from respondents: “My parents ashamed of having blind kid and do not want to be founded or observed by neighbors, in addition to that parents afraid me to meet accident”, “Parents do not want me to work since they can afford to take care of me.”, “Parents do not understand what the blind can or can not and do not pay any attention to the blinds society.”, “Parents do not want to make friendship with other blinds, they fear about some effect from other blinds.”, “Parents misunderstand that blind with acquired visual impairment need more protection than congenital blind.”

Two respondents mentioned even though they wanted to be independent from family but in reality they could not.

4.1.3 Accessibility of public facilities

Table 12 Accessibility of public facilities among all respondents who were visiting alone

| Place to visit alone | n | % | | |
|---------------------------------------------|-------|------|-------------|-----------|
| | | Easy | Not decided | Difficult |
| Department store | n=170 | 22.9 | 17.1 | 60.0 |
| Market | n=171 | 33.3 | 17.0 | 49.7 |
| Buffet (in door) or Eating house | n=170 | 45.3 | 17.1 | 37.7 |
| Governmental office | n=170 | 31.8 | 15.3 | 52.9 |
| Hospital | N=170 | 30.6 | 14.1 | 55.3 |
| Post office | N=170 | 30.0 | 21.8 | 46.5 |
| Barber, Hair dresser | N=170 | 72.4 | 4.1 | 24.4 |
| Social Welfare council | N=172 | 60.5 | 9.9 | 29.7 |
| Office of Thai National Institute for Blind | N=172 | 53.5 | 13.5 | 32.9 |

Accessibility for each public facility is determined by rating score ranging from difficult (1) not decided (2) and easy (3) and summated as total scores to verify the accessibility status among the respondents. Data of those who never experienced to go to some certain facilities or in case that they even do not know the name of the public place were omitted from this analysis. (lost n=3)

More than half mentioned easy places to visit alone were Barber, Hair dresser, Social Welfare council, Office of Thai National Institute for Blind (72.4%, 60.5%, 52.9%, respectively), which is considered to be familiar place for the blind to visit frequently.

Table 13 Accessibility of public facilities among the respondents who were total blind and were visiting with sighted guide

| Place to visit with sighted guide | % | | | |
|---------------------------------------------|-------|------|-------------|-----------|
| | n | Easy | Not decided | Difficult |
| Department store | n=123 | 94.3 | 4.88 | 0.81 |
| Market | n=124 | 91.1 | 7.26 | 1.61 |
| Buffet (in door) or Eating house | n=125 | 96.8 | 2.40 | 0.80 |
| Governmental office | n=125 | 95.2 | 3.20 | 1.60 |
| Hospital | n=126 | 92.9 | 3.17 | 3.97 |
| Post office | n=125 | 89.6 | 8.00 | 2.40 |
| Barber, Hair dresser | n=125 | 96.8 | 1.60 | 1.60 |
| Social Welfare council | n=125 | 92.8 | 6.40 | 0.80 |
| Office of Thai National Institute for Blind | n=124 | 91.9 | 6.45 | 1.61 |

Most of the total blind mentioned that all places were easy to visit if they had been accompanied with the sighted guide.

With regard to accessibility scores following out come was shown in table 14. While 12.4% of the blind answered every public facilities were difficult to access (score=9), 10.0% told it is entirely easy for them to access (score=27). Median value of this variable was 18 within the range from 9 to 27. Among those who were total blind the summation of accessibility scores to reach all public facilities with the

sighted guide was performed and described as presented in table 14. Its minimum score was 17 with median value was 27. Since majority of respondents (78.9%) responded that it was entirely easy to access the public facilities if guided by the sighted guide.

Table 14 Accessibility scores to the public facilities among respondents

| Accessibility scores | (n=170) | % |
|---------------------------------------------------------|---------|------|
| Accessibility alone among both partial and total blinds | | |
| ≤ Median (≤18) | 85 | 50.0 |
| > Median (>18) | 85 | 50.0 |
| Median = 18 Min = 9 Max = 27 | | |
| Accessibility with sighted guide among total blinds | (n=123) | |
| 17-26 < Median (< 27) | 29 | 23.6 |
| 27 ≥ Median (≥ 27) | 94 | 76.4 |
| Median= 27 Min = 17 Max = 27 | | |

4.2 Socio-demographic factors

Number and percentage distribution of respondents by sex are presented in table 12. It was found that the ratio of male cases to female cases was approximately 2:1.

Regarding age, it was found that the respondents' age are ranged from 21 to 67 with the mean average 40.14 (SD±10.13).

Regarding to age onset of blindness, slightly less than half of respondents (41.6%) had developed as congenital blind, while the rest had developed until the age of 5.

On the other hand among those who were acquired type, some (15%) developed their visual impairment after age of 21 years old.

Table 15 Socio-demographic factors of the respondents

| Socio-demographic factors | Total | |
|----------------------------------------------|---------|------|
| | (n=173) | % |
| Sex | | |
| Male | 118 | 68.2 |
| Female | 55 | 31.8 |
| Grading of visual Impairment | | |
| Total blind | 128 | 74.0 |
| Low vision | 45 | 26.0 |
| Age groups (years old) | | |
| 21-30 | 31 | 17.9 |
| 31-40 | 60 | 34.7 |
| 41-50 | 50 | 28.9 |
| 51-60 | 31 | 17.9 |
| >60 | 1 | 0.6 |
| Mean \pm SD = 40.14 \pm 10.12 | | |
| Min = 21 Max = 67 | | |
| Type of blindness | | |
| Congenital | 72 | 41.6 |
| Acquired | 101 | 58.4 |
| Age of onset of blindness (years old) | | |
| 0 | 72 | 41.6 |
| 1-5 | 41 | 23.7 |
| 6-10 | 12 | 6.9 |
| 11-15 | 16 | 9.3 |
| 16-20 | 7 | 4.1 |
| >20 | 25 | 16.5 |
| Mean \pm SD = 7.63 \pm 11.14 | | |
| Min = 0 Max = 56 | | |
| Level of education | | |
| Lower-than-primary | 34 | 20 |
| Primary-regular school | 16 | 9.4 |
| Primary-special school | 22 | 12.9 |
| Secondary-regular school | 35 | 20.6 |
| Secondary-special school | 34 | 20.6 |
| Vocational/College/University | 26 | 15.3 |
| Others | 2 | 1.2 |

Concerning about education, some (20%) of respondents were illiterate, while a few (15.3%) of respondents had got higher education at college, university or equivalent to university level. Only two respondents had obtained an informal education.

Table 16 Socio-demographic factors of the respondents, (continued)

| Socio-demographic factors | Total | |
|-----------------------------------------|----------|------|
| | <i>n</i> | % |
| Occupation | | |
| None | 10 | 5.8 |
| Working with commission selling lottery | 49 | 28.3 |
| Masseur or Masseuse | 49 | 28.3 |
| Street musician | 24 | 13.9 |
| Telephone operator | 9 | 5.2 |
| Teacher or lecturer | 4 | 2.3 |
| Fortune teller | 2 | 1.2 |
| Others | 26 | 15.0 |
| Resident | | |
| Bangkok | 40 | 23.1 |
| Central Region | 32 | 18.5 |
| Northern Region | 27 | 15.6 |
| Northeastern Region | 59 | 34.1 |
| Southern Region | 10 | 5.8 |
| Eastern Region | 5 | 2.9 |

With regard to occupation, leading lists was masseur or masseur (28.3%) and selling lottery (28.3%) followed by street musician (13.9%), telephone operator (5.2%) and teacher or lecturer (2.3%). As minority groups among those who answered other job, 5.3% of respondents were working at home by helping shop keeping or making handicraft, 1.8% were government officers, another 2.9% were working at TAB as the government officers. Only one respondent (0.6%) was a student. Another minorities manifested their occupation as, a bank officer, a machine operator and a radio entertainer.

Hometown of respondents was interviewed according to the regions as shown in the table 16. A few (23.1%) of respondents had their resident in Bangkok, while majority (76.9%) of the respondents had their hometown in other regions. Among those who immigrated to Bangkok from other provinces, 34.1% of respondents came from the northeastern region, followed by the central region (18.5%) and the northern region 15.6%.

Regarding the personal factor toward experience of fall during the last one year and total times of injury occurred in their life as presented table13, it was found that majority (69.9%) of them never fall during the last year, while some (19.7) had fallen 1-3 times. Only a few (10.4%) had fallen more than 3 times.

More than half (62.4%) of respondents had not injured when they were traveling outside. Mean frequency of fall during the last year and frequency of injuries were 1.14(SD = 2.65) and 1.28(SD = 2.53), while the minimum and maximum values of fall were 0-20 and minimum and maximum values of injuries were 0-10, respectively.

Table 17 Experience of fall or injury

| Experience of fall or injury | Total | |
|------------------------------|------------------------------|-------------------------|
| | n=173 | % |
| Fall (times) | | |
| 0 | 121 | 69.9 |
| 1-3 | 34 | 19.7 |
| >3 | 18 | 10.4 |
| | Mean = 1.14 SD = 2.65 | Min = 0 Max = 20 |
| Injury (times) | | |
| 0 | 108 | 62.4 |
| 1-3 | 46 | 26.6 |
| >3 | 19 | 11.0 |
| | Mean = 1.28 SD = 2.53 | Min = 0 Max = 10 |

Mode of transportation in their life in terms of transportation participation was investigated as a question of “What is the type of transportation do you usually use most for your daily life?” and following results were given.

Table 18 Mode of transportation in daily life

| Mode of Transportation | Total | |
|------------------------|-------|------|
| | n=172 | % |
| Public Bus | 102 | 59.3 |
| Bike Taxi | 24 | 14.0 |
| Tuk-Tuk | 15 | 8.7 |
| Taxi | 15 | 8.7 |
| BTS | 1 | 0.6 |
| Others | 15 | 8.7 |

More than half (59.3%) of respondent were using public bus as their daily life transportation. Bike taxi (14%) was also recognized as an important transportation for the blind followed by taxi (8.7%) and Tuk-Tuk (8.7%) among the respondents when travelling in Bangkok.

Among those who answered as others (8.7%), noticeable answers for the mode of transportation were personal car or motorcycle driven by family members or friends and pick up van.

Only one respondent (0.6%) answered BTS as daily transportation, and nobody answered that they utilized train in their daily life transportation.

4.3 Environmental factors

Environmental factors are identified under 2 main topics as 1) Support from family, community and society and 2) Experienced special training or education

4.3.1 Support from family, community and society

As support from family members, community and society people perception of the blind in each statement was asked and answer were given as presented in table 19. Among the negative statements, the scores ware ranged from strongly agree (1) to strongly disagree (5), while among the positive statements are vise versa.

Table 19 Support from family community and society

| Statement | Strongly agree (%) | Agree (%) | Not Decided (%) | Disagree (%) | Strongly disagree (%) |
|----------------------------------------------------------------------------------------------|---------------------------|------------------|------------------------|---------------------|------------------------------|
| Instrumental support | | | | | |
| People are supportive to get on/off vehicles | 18.6 | 58.1 | 6.9 | 14.0 | 2.3 |
| People's support by giving hand for the blinds when crossing the street | 9.3 | 34.9 | 11.6 | 37.8 | 6.4 |
| People's support at stairway | 8.1 | 30.2 | 15.7 | 32.6 | 13.4 |
| Family's accompany to go outside | 10.5 | 25.6 | 11.6 | 44.2 | 8.1 |
| Emotional support | | | | | |
| Family's sympathy for blind's suffering | 24.9 | 46.2 | 5.8 | 19.1 | 4.0 |
| Support from people in Bangkok when traveling | 7.6 | 38.4 | 15.7 | 32.6 | 5.8 |
| Family's encouragement | 21.4 | 59.0 | 5.2 | 11.6 | 2.9 |
| Counseling from family member or friends | 21.4 | 56.1 | 8.1 | 11.0 | 3.5 |
| People without disability are well understanding suffering of PWD | 9.3 | 34.1 | 14.5 | 31.2 | 11.0 |
| Information support | | | | | |
| People in Bangkok always inform the direction | 19.8 | 60.5 | 7.0 | 9.9 | 2.9 |
| Family always provide information related with you | 16.9 | 57.6 | 5.2 | 15.7 | 4.7 |
| Public facilities such as Braille or Voice system are enough to access the daily information | 10.5 | 30.2 | 7.6 | 27.3 | 24.4 |

Instrumental support

Majority (58%) agreed to the statement "Peoples are supportive to get on/off vehicles". Only a few (14%) mentioned they disagreed and strongly disagreed (2.3%) to this statement.

However for the statement "People's support by giving hand for the blind when crossing the street" only one-third (34.9%) agreed to this statement, while those who disagreed found to be higher percentage (37.8%).

Similar response was given to the statement “People’s support at stairway”. Both agreed and disagreed found to be nearly equal (30.2% and 32.6%, respectively).

With regard to the statement of family’s accompany to go outside nearly half (44.2%) of respondents denied support from family members, while one-fourth (25.6%) agreed with this statement.

Emotional support

For the question “Your family members (or friends) are sympathetic enough to listen your suffering, hardship or anxiety”, more than half (71.1%) of respondents agreed or most agreed with family’s sympathy.

With regard to the statement “People in Bangkok ignore you when you need support for your travel” their perception of support from society was measured. It was found that less than half (47%) felt strongly agreed and agreed to this statement.

Concerning the statement “Your family members (or friends) always encourage you when you are sad” more than 80% agreed or most agreed to the statement.

Toward the statement “Your family members (or friends) always support you by providing you their time for your counseling” as well resulted in high affirmative response. Majority (75.6%) of them strongly agreed and agreed to this statement.

Regarding “People without disability around you are well understanding your suffering in your life”, it also found that less than half (43.4%) strongly agreed and agreed to this statement.

Information support

More than 80% of respondents responded to agree to the statement “People in Bangkok are kind enough to inform you the direction in your travelling situation”.

The answer of question “Your family members (or friends) always tell you about the news or information related to you” provided following distribution in which 74% of respondents showed affirmative opinion toward information support from their family.

With regard to public information support asked by the question “Public facilities such as Braille or Voice system are enough for you to access the daily life

information” following results were obtained. Eighteen respondents (10.5%) answered “strongly agree” while greater percentage (24.4%) answered “strongly disagree” and more than 50% of respondents told negative statement.

4.3.2 Experienced special training or education

Regarding to knowing of Orientation & Mobility (O&M) training, majority of respondents (77.5%) answered they knew of O&M training as mentioned in table 20 below.

Table 20 Knowing of O&M training

| Knowing of O&M training | Total | |
|-------------------------|---------|------|
| | (n=173) | % |
| Know | 134 | 77.5 |
| Do not know | 39 | 22.5 |

From table 21 most of interventions were seemed to be well prevailed and accepted by the blind. However advanced intervention such as visual therapy (50.9%) was less prevailed and quality of each intervention could not be described precisely

Table 21 Experienced interventions related with Orientation and Mobility improvement

| Experienced intervention | Total | |
|-------------------------------------------------------------------------|---------|------|
| | (n=173) | % |
| O&M training or Mobility related training | 140 | 80.9 |
| Early treatment from ophthalmologist when your blindness was recognized | 128 | 74.0 |
| Cane skills training | 146 | 84.4 |
| Informed consent about the disorder in your vision system | 123 | 71.1 |
| Visual therapy | 88 | 50.9 |
| Daily living skills | 130 | 75.1 |

Table 22 O& M training from family or community before entering primary school among congenital blind

| O&M training from family before official education | Total (n=64) | % |
|----------------------------------------------------|-----------------|------|
| Yes | 33 | 51.6 |
| No | 31 | 48.4 |

With regard to the O&M related training before starting the primary school among congenital blind, more than half of respondents answered that they have experienced that kind of trainings before entering primary school at home or in their community.

4.4 Psychological factors

Regarding the psychological factors, there are seven perception statements to ask toward the respondents' feeling on their mobility. The results are summarized in table 23.

More than half (54.6%) of the blind strongly disagreed or disagreed the statement, "Do not feel difficulty and uncomfortable when you are traveling around Bangkok".

Regarding to "confidence of survival alone", while 10.4% of respondents strongly agree, 15.0% strongly disagreed to the statement.

Concerning perception of isolation, majorities (64.5%) of respondent answered that they do not have feeling of isolation or self-meaningless.

As for perception of difficulty to get out of their home opinion was separated in both sides. While 38.6% of respondents agreed the statement, 30.4% disagreed to the statement.

Concerning about the perception of prejudice and discrimination, 31.4% of respondents agreed the statement, while 33.7% disagreed.

By asking free mobility is an important factor in blind's life, 46.2% of respondents strongly agreed and 44.5% agreed to the statement. Only four respondents (2.3%) strongly disagreed to that statement.

Table 23 Distribution of Perception statement

| No | Statement | Strongly Agree (%) | Agree (%) | Not Decided (%) | Disagree (%) | Strongly Disagree (%) |
|----|-------------------------------------------------------------------------------------------|--------------------|-----------|-----------------|--------------|-----------------------|
| 1 | Do not feel difficulty and uncomfortable when you are traveling around Bangkok. | 4.65 | 25.0 | 15.7 | 36.6 | 18.0 |
| 2 | Be confident to survive without any support from other people around you | 10.4 | 27.8 | 13.9 | 33.0 | 15.0 |
| 3 | Do not feel any isolation from society and feelings of meaningless in one self. | 22.5 | 41.6 | 9.8 | 17.3 | 8.7 |
| 4 | It is easy to go out of your home. | 8.2 | 38.6 | 15.8 | 30.4 | 7.0 |
| 5 | Do not feel any prejudice or discrimination from people in the society. | 8.7 | 31.4 | 17.4 | 33.7 | 8.7 |
| 6 | Free mobility is also one of the most important factors in blinds' life. | 46.2 | 44.5 | 2.9 | 4.1 | 2.3 |
| 7 | When you were young, your parents did not overprotect you and took you out of home often. | 16.8 | 43.4 | 10.4 | 16.8 | 12.7 |

With regard to the perception of overprotection from their family with the statement of “When you were young, your parents did not overprotect you and took you out of home often”, 43.4% of respondents agreed and 16.8% strongly agreed.

4.5 Relationship between socio-demographic factors, environmental factors, psychological factors and mobility status

Mobility status between both male and female were not significantly different in statistical point of view. However if median value Q1 and Q3 were considered male was slightly active than female in each mobility status.

With regard to the type of blindness it may say congenital blind is more active than acquired blind in terms of walking time and accessibility when median values were compared but it was not statistically significant.

Table 24 Comparison of mobility status by sex, type of blindness and grade of blindness

| Factors | % (n=171) | Mobility Status | | |
|--------------------------|-----------|-----------------|----------------------|-------------------------------|
| | | Times go out | Average walking time | Rating scale of accessibility |
| Sex | | | | |
| Male | 68.4 | 7.0 (5.0, 7.0) | 180 (60, 330) | 19 (13, 22) |
| Female | 31.6 | 7.0 (3.0, 7.0) | 120 (60, 330) | 17 (11, 22) |
| <i>p</i> -value* | | 0.462 | 0.135 | 0.270 |
| Type-of Blindness | | | | |
| Congenital | 42.1 | 7.0 (5.0, 7.0) | 240 (70, 360) | 19.0 (14, 22) |
| Acquired | 57.9 | 7.0 (5.0, 7.0) | 120 (60, 300) | 18.0 (12, 23) |
| <i>p</i> -value* | | 0.70 | 0.64 | 0.875 |
| Grade of Blind | | | | |
| Total | 73.7 | 7.0 (14, 22) | 180 (70, 360) | 18.0 (14, 22) |
| Low vision | 26.3 | 7.0 (12, 23) | 150 (60, 300) | 20.0 (12, 23) |
| <i>p</i> -value* | | 0.578 | 0.982 | 0.021 |

*Mann-Whitney test

Concerning the grade of blindness even though average walking time is slightly higher in the total blind if only median value was compared with the low vision ($p=0.982$). However accessibility of the low vision was higher than the total blind at significant statistical level ($p=0.021$). It is needless to say person with residual visual ability have high capability in many life related activity.

Mobility status with regard to the hometown, education level and occupation was shown in table 25.

Concerning hometown, among six regions mentioned above, median value of accessibility scores of respondents who came from northeastern region showed the lowest score when compared to other regions. It was found to be significantly different ($p=0.007$), while there were not any significant difference among the times to go out and the average walking time.

Table 25 Comparison of Mobility status according to the socio-demographic factors

| Socio-demographic factors | Number | Times go out | Mobility Status Median (Q1, Q3) | |
|---------------------------|--------|------------------|------------------------------------|---------------------|
| | | | Average walking time | Accessibility score |
| Resident place | | | | |
| Bangkok | 40 | 6.0 (5.0, 7.0) | 120 (60, 300) | 21 (17, 24) |
| Central region | 31 | 7.0 (3.0, 7.0) | 120 (45, 240) | 17 (13, 21) |
| Eastern region | 5 | 9.0 (2.0,14.0) | 60 (20, 360) | 23 (19, 26) |
| Northern region | 27 | 7.0 (2.0, 7.0) | 120 (60, 300) | 20 (14, 23) |
| Northeastern region | 58 | 7.0 (6.0, 7.0) | 240 (90, 420) | 15 (11, 20) |
| South region | 10 | 7.0 (7.0, 8.0) | 270 (150, 405) | 19.5 (14, 24) |
| <i>p</i> -value* | | 0.061 | 0.104 | 0.007 |
| Education | | | | |
| None | 34 | 7.0 (3.0, 7.0) | 225 (30, 375) | 14 (9, 19) |
| Regular primary | 16 | 7.0 (5.0, 7.0) | 90 (40, 345) | 19 (12, 22) |
| Special primary | 21 | 7.0 (3.0, 7.0) | 240 (120, 360) | 19 (15, 21) |
| Regular secondary | 35 | 6.0 (2.0, 7.0) | 150 (60, 270) | 17 (13, 23) |
| Special secondary | 34 | 7.0 (6.0, 7.0) | 150 (60, 375) | 21 (17, 24) |
| College or University | 26 | 7.0 (6.0, 12.0) | 120 (210, 240) | 20 (17, 25) |
| <i>p</i> -value* | | 0.042 | 0.470 | 0.001 |
| Occupation | | | | |
| None | 10 | 3.5 (0.0, 8.0) | 120 (15, 210) | 19 (13, 23) |
| Teacher or lecturer | 4 | 6.5 (5.0, 7.0) | 60 (30, 90) | 15 (9, 25) |
| Selling lottery | 48 | 7.0 (7.0, 7.0) | 300 (120, 360) | 19 (13, 25) |
| Massage | 48 | 5.5 (1.0, 7.0) | 120 (30, 300) | 19 (14, 22) |
| Fortune teller | 2 | 7.0 | 90 | 18 |
| Telephone operator | 9 | 6.0 (5.0, 6.0) | 60 (60, 120) | 17 (14, 25) |
| Street musician | 24 | 7.0 (5.0, 7.0) | 300 (75, 360) | 13 (9, 19) |
| <i>p</i> -value* | | <0.001 | 0.003 | 0.113 |
| Age groups (years) | | | | |
| 21-30 | 30 | 7.0 (5.0, 12.0) | 120 (50, 240) | 21.0 (16, 24) |
| 31-40 | 60 | 7.0 (3.0, 7.0) | 225 (60,360) | 18.0 (14, 22) |
| 41-50 | 49 | 7.0 (5.0,7.0) | 180 (60, 360) | 17.0 (11, 21) |
| >51 | 31 | 6.0 (5.0, 7.0) | 180 (60, 270) | 18.0 (9, 21) |
| <i>p</i> -value* | | 0.176 | 0.244 | 0.021 |

*Kruskal-Wallis test

Regarding education, those who were not educated even in primary school level showed significantly low accessibility scores when compared to other education levels ($p=0.001$). There was not significant difference among both time to go out and the average walking time.

With regard to the occupation, those who did not have any job had less frequency of time going out of their home and it was found to be significant difference among different occupation ($p<0.001$). While the blind selling lottery or living on as a street musician were taking a walk a day 300 minutes on average, teachers, lecturers and telephone operators were taking shorter minutes of walking. It also found significant difference of average walking time among different occupation ($p=0.003$). However there was not significant difference in the accessibility score among those occupations ($p=0.113$).

Table 26 Comparison of mobility status according to age on set and duration of blindness

| History of blindness | Mobility status | | | |
|---------------------------|-----------------|----------------|----------------------|---------------------|
| | Median (Q1, Q3) | | | |
| | % | Times go out | Average walking time | Accessibility score |
| Age on set (years) | | | | |
| 0 | 41.6 | 7.0 (5.0, 7.0) | 240 (70, 360) | 19 (14, 22) |
| 1-5 | 23.7 | 7.0 (5.0, 7.0) | 240 (90, 360) | 19 (13,25) |
| >6 | 34.7 | 7.0 (2.0, 7.0) | 120 (30, 240) | 17 (12, 22) |
| <i>p</i> -value* | | 0.153 | 0.008 | 0.569 |
| Duration (years) | | | | |
| 0-5 | 2.3 | 4.0 (0.5, 6.5) | 75.0 (35, 120) | 17.0 (11,25) |
| 6-10 | 3.5 | 3.0 (0.0, 7.0) | 90.0 (20, 270) | 21.0 (13, 23) |
| >11 | 94.2 | 7.0 (5.0, 7.0) | 180 (60, 330) | 18.0 (13, 22) |
| <i>p</i> -value* | | 0.026 | 0.145 | 0.845 |

*Kruskal-Wallis test

With regard to the age groups, Table 25 shows the mobility status of four age groups 21-30, 31-40, 41-50 and >50 years old.

Accessibility score among the age group 21-30 showed significantly high score compared to the other groups ($p=0.021$), while the other two mobility variables found no significant difference.

With regard to the on set of blindness significant difference was found in the average walking time ($p=0.008$). Those who developed blindness over 6 years old showed lower times of walking. There was not significant difference in the variables of time go out and accessibility score among onset age of 0, 1-5, >6.

Regarding the duration of blindness 4 (2.3%) of respondents developed blindness within 5 years prior to this study and 6 (3.5%) of respondents developed within 6 to 20 years, while 94.2% of respondents developed blindness more than 10 years before. Those who developed blindness within 5 years showed less amount of median value in time go out, average walking time and accessibility score.

Table 27 Mobility status according to experience of fall during the last year and injury in lifetime

| Experience of fall or injury | Mobility status <i>Spearman Rho</i> (p -value*) | | |
|------------------------------|----------------------------------------------------------|----------------------|---------------------|
| | Times go out | Average walking time | Accessibility score |
| Fall during the last year | 0.075 (0.328) | -0.039 (0.616) | -0.118 (0.126) |
| Injury in lifetime | 0.019 (0.809) | -0.087 (0.259) | -0.104 (0.175) |

*Spearman rank correlation

There was not significant correlation between mobility status and experienced times of fall and injury.

With regard to environmental factors, in general, most of interventions listed in table 28 were found to be significantly related.

Those who had experience of O&M training or mobility related training had significantly greater median of accessibility score compared to the non-experienced group ($p=0.047$)

Regarding early treatment from ophthalmologist, those who had experience had significant greater median of accessibility score compared to those who had no experience ($p=0.004$)

Table 28 Comparison of mobility status according to O&M intervention

| Intervention | Mobility status Median (Q1, Q3) | | | |
|-------------------------------------------------------------------|------------------------------------|----------------|----------------------|---------------------|
| | % | Times go out | Average walking time | Accessibility score |
| O&M training or Mobility related training | | | | |
| Not Experienced | 18.7 | 7.0 (5.0, 7.0) | 150 (60, 300) | 15 (9, 21) |
| Experienced | 81.3 | 7.0 (5.0, 7.0) | 180 (60, 345) | 19 (14, 23) |
| * p -value | | 0.960 | 0.261 | 0.047 |
| Early treatment from ophthalmologist | | | | |
| Not Experienced | 25.3 | 7.0 (3.0, 7.0) | 180 (45, 360) | 15 (9, 20) |
| Experienced | 74.7 | 7.0 (5.0, 7.0) | 150 (60, 330) | 19 (14, 23) |
| * p -value | | 0.865 | 0.754 | 0.004 |
| Cane skill training | | | | |
| Not Experienced | 15.8 | 7.0 (3.0, 7.0) | 60 (30, 270) | 14 (9, 20) |
| Experienced | 84.2 | 7.0 (5.0, 7.0) | 180 (60, 360) | 19 (14, 23) |
| * p -value | | 0.507 | 0.013 | 0.016 |
| Informed consent about the disorder in one's vision system | | | | |
| Not Experienced | 29.2 | 7.0 (3.0, 7.0) | 255 (60, 360) | 18 (12, 22) |
| Experienced | 70.8 | 7.0 (5.0, 7.0) | 135 (60, 300) | 19 (13, 22) |
| * p -value | | 0.906 | 0.322 | 0.192 |
| Visual therapy | | | | |
| Not Experienced | 49.1 | 7.0 (3.0, 7.0) | 180 (60, 350) | 17 (11, 21) |
| Experienced | 50.9 | 7.0 (5.0, 7.0) | 150 (60, 330) | 19 (15, 23) |
| * p -value | | 0.223 | 0.958 | 0.026 |
| Daily living skills | | | | |
| Not Experienced | 24.6 | 6.0 (2.0, 7.0) | 120 (60, 330) | 14.0 (9, 23) |
| Experienced | 75.4 | 7.0 (5.0, 7.0) | 180 (60, 330) | 19.0 (12, 22) |
| * p -value | | 0.067 | 0.458 | 0.079 |

*Mann-Whitney test

Respondents who had cane skill training experience had less average walking time compare to those who had no experience ($p=0.013$).

In addition, those who had cane skill training experience had greater median of accessibility score compared to the non-experienced group ($p=0.016$).

Regarding the visual therapy, those who had experience had greater median of accessibility score compared to the non-experienced group ($p=0.026$).

Daily living skills also seems important for improvement of average walking time and accessibility when concerning the difference of median value, but since this training is composed as one of O&M training, it could not be concluded whether it is effective for creating better mobility status of the blinds.

Table 29 Comparison of mobility status according to O&M training from family and community before formal education among congenital and early developed (age <5 years old) blinds

| O&M from family or community before formal education | % | Mobility status Median (Q1, Q3) | | |
|------------------------------------------------------|------|---------------------------------|----------------------|---------------------|
| | | Times go out | Average walking time | Accessibility score |
| Not Experienced | 50.5 | 7.0(5.0, 7.0) | 180(60, 330) | 19(13, 22) |
| Experienced | 49.5 | 7.0(6.0, 7.0) | 240(90, 360) | 20(15, 24) |
| <i>p</i> -value* | | 0.325 | 0.477 | 0.576 |

*Mann-Whitney test

All mobility status measurements in terms of times go out, average walking time and accessibility score were found to be no significant different among those who had experience and those who did not have experience the O&M training from family and community as shown in table 29.

Table 30 Correlation between total score of social support and mobility status

| Total social support score | Mobility status | | |
|-----------------------------------|---------------------------------------|----------------------|-------------------------------------|
| | Times go out | Average walking time | Rating scale of Accessibility score |
| | <i>Spearman Rho</i> <i>p-value</i> | | |
| Instrumental support | -0.128 0.096 | 1.057 0.462 | 0.106 0.168 |
| Emotional support | -0.131 0.088 | 1.098 0.205 | 0.002 0.981 |
| Information support | -0.135 0.079 | -0.010 0.900 | 0.117 0.130 |
| Grand total of all support | -0.180 0.019 | 0.061 0.430 | 0.086 0.263 |

*Spearman rank correlation

There was not significant correlation between instrumental, emotional and information support and mobility status but regarding total score of support there was negative correlation between grand total of all support and times go out ($p=0.019$). It might mean too much support for the blind may reduce their chance to go out from home in terms of over protection.

Table 31 Correlation between psychological factors and mobility status

| Psychological factor and mobility | Mobility status | | |
|-----------------------------------|-----------------------------------------|----------------------|-------------------------------|
| | Times go out | Average walking time | Accessibility score |
| | <i>Spearman Rho</i> <i>(p-value)</i> | | |
| Total score | 0.086 (0.269) | -0.032 (0.681) | 0.405 (<0.001) |

*Spearman rank correlation

With regard to psychological factors there was significant correlation ($r=0.405$) between total score of psychological factor and accessibility ($p<0.001$).

4.6 Qualitative data

Table 32 Answers toward the statement “What is the most difficult point when you are travelling in Bangkok metropolis?”

| Rank | Category | Sub-group | % (n=168) | | |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------|------------------------------------------------|---------------------------------------------------------------------------|------|
| 1 | Accessibility and practicability of public bus service (n = 108) | To get on/off the bus | 21.4 | | |
| | | To distinguish correct bus number | 14.9 | | |
| | | To catch the bus | 12.5 | | |
| | | Find correct bus | 7.7 | | |
| | | Service in the bus | 4.8 | | |
| | | Waiting for the bus | 1.8 | | |
| | | Manner of cashier | 1.2 | | |
| | | 2 | Architectural barrier on the sidewalk (n = 73) | All kind of architectural barrier on sidewalk is barrier to walk smoothly | 16.7 |
| Rumps to get on the sidewalk and gaps between the street | 8.3 | | | | |
| Parking car | 4.2 | | | | |
| Street vender | 2.4 | | | | |
| Trees | 2.4 | | | | |
| Manhole without cap | 2.4 | | | | |
| Concrete post | 1.8 | | | | |
| Pipes | 1.8 | | | | |
| Bumpy motorway and bad condition of sidewalk | 1.8 | | | | |
| Water catchments | 0.6 | | | | |
| Phone booth | 0.6 | | | | |
| Architectural barrier on | 0.6 | | | | |
| Guiding tiles | 0.6 | | | | |
| 3 | Difficult to find correct destination (n=17) | | | | 10.1 |
| 4 | No one help according to blinds' needs. People are not cooperative and supportive for blinds (n=13) | | | | 7.7 |
| 5 | To across the street (n=12) | | 7.1 | | |
| 6 | Traffic jam (n=9) | | 5.4 | | |
| 7 | To travel alone (n=3) | | 1.8 | | |

Table 32 Continued

| Rank | Category | % (n=168) |
|-------------|----------------------------------------------|----------------------|
| 7 | Manholes at everywhere | 1.8 |
| 7 | To go where haven't been to | 1.8 |
| 7 | Fear of car crash | 1.8 |
| 11 | Rainy day (n=2) | 1.2 |
| 12 | Difficulty to find motor cycle service (n=1) | 0.6 |
| 12 | Traffic noise | 0.6 |
| 12 | Crowded place | 0.6 |
| 12 | To go through walkway | 0.6 |
| 12 | No traffic signals | 0.6 |
| 12 | To get on/off the van | 0.6 |

With open-ended question, “What is the most difficult point when you are travelling in Bangkok metropolis” following statements were given in table 32.

It is notable that as much as 108 responses were related with accessibility and practicability of public bus service. It seems reasonable to suppose that public bus service is the most important mode of transportation among the blind even though the service was not designed to meet the need of the blind. Plainly there is still some room to discuss about the way to improve public bus service for blinds. How to provide good support for the blind to wait for the bus easily, to get on/off the bus, to distinguish correct bus or its number, and to catch the bus, to afford good services in the journey in the bus should be discussed respectively.

Seventy-three respondents had made remarks for architecture barriers on the sidewalk, of which 28 respondents answered it as general troubles while 45 respondents pointed out specific target to which they were obstructed in their daily travel.

The statement “ It is difficult to find correct destination.” (17 answers) “No one help according to blinds’ needs. People are not cooperative and supportive for blinds”(13 answers) and “it is difficult to across the street” (12 answers) indicated that there is still some room for public facilities or support from society to improve.

At the end of the interview, final inquiry with the statement “What is your needs and suggestions on the government policy to support the blind for mobility outside home” was performed. The result was shown in table 33.

It is remarkable that most of respondents (64.3%) had compliments about public bus service. It is reasonable that public bus is the most important mode of transportation for blinds since 60% of blinds used public bus as daily transportation. Contents of public bus service for the blinds can be realized by the list of their opinion.

Architectural barriers on the sidewalk also considered to be problematic issues if considering the physical ability of the blind. List of details show the difficulty of the blind.

Most common answer was related with voice supporting system to facilitate the blind’s travelling especially in public bus, at bus stop, at a crossroad, at the BTS station, at the ATM, at government office and so on. Only 4 respondents required special bus equipped with voice navigator to be designed to support the blind.

Second common answer was related with condition of street and sidewalk, street vender, manhole without cap, badly drained spot. Width of street should be expanded for both people and vehicles. It should be standardized like other industrialized countries. Warning sign was required on the sidewalk to prevent the blind from accident. Five respondents wanted to expand the sidewalk and footpath widely.

Twenty-seven of respondents mentioned the attitude and behavior toward blind should be altered to facilitate their travelling. They also mentioned that education for cashier and better working condition can enable them to pay more attention for the blind.

Among those answers concerning their requirement for the government to improve the mobility status of the blind job is not directory related with their mobility status. However income generation by means of job security considered to be a crucial theme for the blind.

Bus drivers also were required to pay more attention for the blind. Because it is always extremely difficult for the blind to find and catch the correct public bus, get on/off safely and smooth, and feel comfortable throughout their journey. To stop for a while at each bus stop and gentle driving technique was required for the drivers.

Table 33 Requirement for Thai government to improve their mobility

| Raking | Statement | % (n=165) |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| 1 | Voice assisting system should be equipped in public bus, bus stops and crossroad | 40.1 |
| 2 | Condition of street or sidewalk should be improved | 24.2 |
| 3 | Want support especially from cashier in public bus to enable blinds to get on/off public bus safely and know the correct direction in a proper manner. | 16.4 |
| 4 | Job for blinds to be independent financially and place for blind to work without being arrested by police | 7.3 |
| 5 | Want bus drivers not to do aggressive drive and pay attention for blinds to enable blinds to get on/off bus with safety. | 6.1 |
| 6 | Discount or free ticket for blinds | 4.8 |
| 6 | Need more education or vocational training for blinds to expand their life activity as well as carrier fund. | 4.8 |
| 8 | Need Braille in public place such as bus stops, government office and crossroad. | 4.2 |
| 9 | Education for society how to live together with PWD and support them. | 3.6 |
| 10 | Improve the service of every transportation | 3.0 |
| 10 | Should provide enough traffic light with sound at each cross road to assist the blinds when walking across the street to safe their life and reduce traffic accident. | 3.0 |
| 10 | Guide persons to help blinds to help get on/off public bus and cross the street and navigate while blinds are travelling | 3.0 |
| 13 | Want guiding tile to be equipped on the sidewalk according to blinds' need. | 2.4 |
| 13 | Provide more living place for the blinds to live nearby their working place | 2.4 |
| 13 | Computer, voice command telephone or other assisted facilities for the blinds. I.e, Web site for blinds | 2.4 |
| 16 | Prohibited cars and motorcycles to ride or park on footpath | 1.8 |
| 16 | Public bus should stop at every bus stop. Special lane for bus to make it possible to stop nearby sidewalk was required to enable them to stop appropriately. | 1.8 |
| 16 | Need medical insurance incase of injury or other health insurance system | 1.8 |
| 20 | Reduce the school fee for their children | 1.2 |
| 20 | Want to change the rump to smooth slope | 1.2 |
| 20 | Want to have white cane to travel around outside | 1.2 |

One respondent mentioned sometimes cashier does not receive money from blinds, but normally even the fee of public bus was considered to be one of financial burden for blinds.

Social participation by means of education was considered to be important issues for the blind even though it is not directly related with mobility status.

Braille boxes at bus stops to assist the blind to verify the bus stop and number of the bus passes through the place, at the cross road, at the hospital, at the department store, and the government office were required.

Other minor responses were as follows:

“Provision of clear and enlarge letters of signs to show direction or place to reach for low vision and elderly”, “Government officer should treat the blind in same manner as sighted”, “Guide person to support the blind to enable to do official procedure at government office”, “More slopes for wheel chairs in public place”, “Beg for living expenses.”

CHAPTER V

DISCUSSION

The respondents selected in the sample were 173 blinds who had been currently living in Bangkok metropolitan area at least 6 months prior to the period of data collection. More than half of respondents had immigrated to stay in Bangkok. One respondent answered that he came to Bangkok to make some money to stay at rural province. The reason why they came to Bangkok was not asked in this study but there might be some advantage for them to prefer to stay in Bangkok. Data collection was performed at 5 different places and 5 households to elaborate reasons why staying home as always. In terms of homogeneity and reduce selection bias, method of sample selection were designed to draw respondents from many target areas in order to obtain information close to the true population characteristics. It cannot be said that this sample population was the real representative of total subjects who are living in Bangkok metropolitan area.

5.1 Assessment of mobility status among the blinds

Regarding assessment of mobility status, average time of walking in a day, times of going out from home in a week, accessibility score to public facilities were designed in order to obtain details of accessibility status among the blind.

In terms of participation for transportation, utilization of transportation and travelling as a pedestrian which is in the concept of ICFDH-2 those three measurement can not be defined as the direct indicators. However it is no exaggeration to say those three variables can indicate the mobility of the blind according to the definition of Oxford Advanced Learner's dictionary (9) "Ability to move or travel around easily".

It is not too far from the truth that weight of significance among those three variables can not defined or standardized in a proper way since each person have one's own need and value concerning about mobility. In another word two variables of times go out of home in a week and average walking hours per day might represent the quantity of mobility while accessibility to public facilities might represent quality of mobility.

With regard to the mobility status most of respondents who were recognized as active persons since majority (60.8%) of the blind went out from home more than once a day and median value of average walking time 165 minutes/day was considered to be high amount. It might be true that the reason why the blind should be so energetic was to earn money from their job in order to survive. The evidences that most (94%) of the blind had any kind of job and leading motivation of their motivation to go out in table 10 are supporting this statement.

Concerning accessibility to each public facilities table 13, familiar places such as barber, social welfare council and office of Thai National Institute for Blind showed high accessibility by perception of respondents while less familiar places such as department store, post office and hospital showed low accessibility. So it is not too far from the truth to say familiarity of each public facilities can enable blinds to access there more freely in terms of adjustment. Guide person was considered to be most effective factor to enable blinds to access public places since accessibility scores among the total blind were dramatically increased by means of sighted guide. However in terms of independence other factors should be discussed with concerning about its strength and weakness.

5.2 Assessment of mobility status according to socio-demographic status

Vithita Prachanukul (21) have mentioned that female have more travel problems than male due to the nature and culture of both sex upbringing in the Thai society that focuses on inculcating the male to become the leader of the family and to work outside while the female are in charge of the home chores.

Table 34 Grade of blindness by sex

| Sex | Grade of blindness | | χ^2 (df) | <i>p</i> -value |
|--------|------------------------|----------------------|------------------|-----------------|
| | Total blind (n=128) | Low vision (n=45) | | |
| Male | 95 (80.5%) | 23 (19.5%) | 8.199 | 0.004 |
| Female | 33 (60%) | 22 (40%) | (1) | |

Concerning the mobility status according to table 24 significant difference between male and female was not pointed out, however if concerning the evidence that prevalence of the total blind was significantly higher in male than female statement in table 35 is considered to be preferable.

Table 35 Comparison of Mobility status among the total blind between male and female

| Sex | Measurement of Mobility Median (Q1, Q3) | | | |
|-------------------|--------------------------------------------|----------------|-------------------------|------------------------|
| | Number (n=128) | Times go out | Average walking time | Accessibility score |
| Male | 94 | 7.0 (5.0, 7.0) | 180 (60, 360) | 19 (13, 22) |
| Female | 32 | 6.0 (2.0, 7.0) | 80 (30, 330) | 15.0 (11, 20) |
| * <i>p</i> -Value | | 0.165 | 0.044 | 0.077 |

*Mann-Whitney test

Table 35 shows that mobility status of male are higher than female if considered the median value. Average walking time was significantly higher among the male total blind than among the female total blind ($p=0.044$).

This evident can support the statement of Vithita Prachanukul (21) that female have more travel problems than male or naturally female are very timid, considerate, and rarely trust the stranger for assistance.

Following result in table 36 concerning prevalence of experience of O&M training among male and female shows that curriculum of education or training system in Thailand relevant with O&M are different between the male blind and the

female blind. In fact training curriculum of the two centers, Skills Development Center for the Blind and the Sampran Rehabilitation and Vocational Training Center for Blind Woman, concentrate on different matters. While the Skills Development Center for the Blind emphasizes on white cane technique for the male, the Sampran Rehabilitation and Vocational Training Center for Blind Woman focuses on Activity of Daily Living training for the female (21).

Table 36 Experience of O&M training by sex

| Sex | O&M training or Mobility related training | | χ^2 (df) | p-value |
|---------------|-------------------------------------------|---------------------------|------------------|---------|
| | Experienced (n=140) | Not experienced (n=33) | | |
| Male | 102 (86.4%) | 16 (13.6%) | 7.315 | 0.007 |
| Female | 38 (69.1%) | 17 (30.9%) | (1) | |

With regard to the resident place those who immigrated to Bangkok from northeastern region showed less accessibility score compare to the blinds coming from other region and original residents in Bangkok.

The reason why those who had come from northeastern region had less accessibility might depend on their education level. Following table 37 shows relationship between illiteracy status and residence ($p < 0.001$).

Regarding the mobility status according to age groups in table 25 young generation, 20-30 years old, had higher accessibility score. The reason of this generation gap concerning mobility status might be able to seek for transition of education system and life style in Thailand, role in their family in addition to the advantage of their youth.

From statistical evidence found in table 25 it may conclude that education may help the blind to have better access to the public facilities.

However, with regard to the physical mobility such as the times to go out of home and average walking time, those who had come from northeastern region did not show any significance of inactiveness compare to those who had come from other regions. In fact, median value of average walking time was the highest among the total blind except for the blind from southern region (270min/day).

Table 37 Illiteracy state among the blind by residence

| Residence | Illiteracy state | | χ^2 (df) | p-value |
|------------------------|----------------------|------------------------------------------------------|------------------|---------|
| | Illiterate (n=34) | Educated at least primary school level (n=136) | | |
| Northeastern region | 24 (41.4%) | 34 (58.6%) | 25.149 (1) | <0.001 |
| Other regions | 10 (8.9%) | 102 (91.1%) | | |

It might be possible to pursue the reason for the financial disadvantage and characteristics of jobs in which the respondents from northeastern region was serving. For example among 24 respondents those who answered their occupation as street musician 20 (83.3%) was from northeastern region.

It may conclude that those who came from northeastern region have to walk longer than other blinds to make their living allowance even though their ability to access public facilities were not well trained.

With regard to education, the illiterate blind showed low accessibility score while average walking time and times to go out were not different from other educated groups. Table 38 shows that without formal education it was difficult to promote O&M training for the blind.

Table 29 showed that O&M training from family or community before formal education is not efficient to create better mobility status among blinds. It might

suggest that quality of informal education is not good enough or it might be too early to start O&M training before enter primary school.

However considering the recall bias and confounding factor in terms of consistent training after entering formal education there is not enough evidence to deny the importance of early intervention.

The findings also indicated that from the aspect of government policy makers, it cannot be over emphasized that to provide education for every blind is an important issue to create better mobility status. In addition how to provide O&M training for those who could not afford any education will be also crucial issues to create equal freedom in mobility among the blind.

Regarding the fact until the proclamation of Rehabilitation Act of 1991 education for the blind was not compulsory, it may need to consider toward younger blinds that had no experience of O&M training

Table 38 Educational status by experienced O&M training

| Education state | O&M training and mobility related training | | χ^2 (df) | p-Value |
|---------------------------------|--------------------------------------------|-------------------------|---------------|---------|
| | Experienced (n=32) | Not experienced (n=138) | | |
| Illiterate | 15 (44.1%) | 19 (55.9%) | 17.80 | <0.001 |
| Educated at least primary level | 17 (12.5%) | 119 (87.5%) | (1) | |

Regarding history of impairment in this study, type of blindness was not found to be significantly affecting the accessibility status. Further more table 26 showed the congenital blind had high walking time on average when compared with those who developed blindness 1-5, or >6 years old.

This fact does not support the statement of Warren (24) “*The congenital disabled usually had less daily life experience, social roles and social and environmental*

incidents than the acquired disabled. These were crucial for self-concept development.” However taking the limitation of this study into account that sample population were only those who living in Bangkok Metropolis more than a half of year, may not conclude that there is not significant difference of accessibility status between the congenital and the acquired blind.

Concerning the facts residual visual capability is the most significant determinant for their daily activity among person with visual impairment (25) was supported by the result of this study that grade of blindness, the low vision or the total blind, was found to be significant with the accessibility score ($p=0.021$). Therefore to provide early detection and proper medical treatment is indispensable as well as prevention of visual impairment in order to help reduction of blindness among the society. However to discuss on the treatment and prevention of visual impairment is beyond scope of this study.

5.3 Assessment of mobility status according to the history of visual impairment

Regarding the duration of blindness in table 26, four (2.3%) of respondents developed blindness within 5 years prior to this study and six (3.5%) of respondents developed within 6 to 20 year, while 94.2% of respondents developed blindness more than 10 years before. Those who developed blindness within 5 years showed less amount of median value in time go out, average walking time and accessibility score.

This might support the statement (21) that human nature needs time to adopt it self to something. However if we look at the sample size of person who developed blindness within 5 years it is risky to conclude so.

With regard to early assessment which was questioned as the statement of “Early treatment from ophthalmologist when your blindness was recognized” was found to have significant relationship with accessibility ($p=0.004$). However further study will be needed to confirm this evidence based on the scientific records. It takes specialist

to examine it since real medical level or precise prevalence of that intervention is beyond researcher's knowledge. One respondent mentioned "*When I developed my visual impairment with pain in my childhood my parents take me to the hospital immediately, but physician just gave me NSAID and told my parents to observe it, so even now I don't know what is the real reason why I lost my sight.*"

5.4 Assessment of mobility status according to environmental factors

From the aspect of rehabilitation or training programs such as visual therapy or cane skill training, it was considered to be effective factors related to the accessibility scores ($p=0.026$, $p=0.016$). Cane skill training was also considered to be a factor to improve the average walking time of the blinds ($p=0.013$). As is mentioned that O&M training is normally provided as the standard for the blinds and consequently there is a significant relationship between experience of O&M training and educational status. As can be expected in this study those who experienced O&M training or mobility related training showed high accessibility score ($p=0.047$).

It was found that one fifth (19.1%) of the blind still have no experienced on the O&M training or mobility related training and even did not have (22.5%) any knowledge of O&M training, there is still room to improve the accessibility by O&M training. In practice after proclamation of compulsory education 1981 (14) it is expected that this figure will be increased up to 100% theoretically.

Concerning the environmental factor, support from family, community and society might be paid role for the blind to improve their accessibility. Instrumental support such as giving hand for the blind when they are crossing the street or walkway enabled them advanced access to the public facilities. It might be far from truth that instrumental support for the blind as a sighted volunteer in public place will improve their access to the public facilities. Support to get on and off vehicles enable the blind to take a long distance journey in terms of increased average times of walking a day. It can not be denied that support from society create improvement of

accessibility by creating better psychological environment since there was also correlation between psychological factor and accessibility ($p < 0.001$).

With regard to the mode of transportation for working place or study previous study by Angkana Chairatananon (36) was cited to compare with general population in Bangkok.

Table 39 Mode of transportation for working place or study

| Mode of Transportation to work/study | Percentage among general population (%) | Percentage among the blinds (%) |
|--------------------------------------|-----------------------------------------|---------------------------------|
| Private Car | 46.1 | 5.8 |
| Buses | 37.6 | 55.8 |
| BTS | 5.6 | 0.6 |
| Taxi | 2.6 | 4.7 |
| Walk | 4.2 | 15.7 |
| Others | 3.9 | 17.4 |

Firstly of all, bus was considered to be a main mode among the blinds (55.8%) while it was found to be second common mode among general population in Bangkok (37.6%). On the contrary, while leading mode of transportation among general population was private car (46.1%), only 5.8% of the blinds answered they use car for working place driven by family or friends

Secondly some (15.7%) of the blind were going to their working place by walking while only a few (4.2%) of general population were taking a walk for their office or school.

On the other hand, BTS service was provided for 5.6% of general population and is utilized only 0.6% of the blind.

Among the respondents that answered others (17.4%) main modes of transportation were Tuk-tuk and Bike-Taxi. If compare with the figure (3.9%) among

general population who answered as others Tuk-tuk Taxi, followed by Bike-taxi was considered to be still much important mode of transportation among the blind.

These results suggested for some characteristics of the specific mode of transportation among the blind. Due to the fact the blind could not drive any private cars by themselves the percentage of car was lower among the blinds and importance of other transportation is increased automatically.

It seems reasonable that some (15.7%) of the blind took a walk to their working place because in practice some of the blind were living in the same place as their working place or place nearby their home in order to avoid difficulty of travelling. In addition to that physical and financial accessibility for each public transportation might have strong point and weak point for the result respectively, which should be discussed more.

CHAPTER VI

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

This study regarding with assessment of mobility among the blind was conducted among those who living in Bangkok more than a half of year. The subjects' age were between 21-67 years old. Most of them were male.

Mobility status was described and analyzed according to the personal factors, history of visual impairment, environmental factors and psychological factors.

With regard to personal factors age, gender, occupation, educational level and resident, which is regarded to be unchangeable factors, different mobility status was observed. Young generation aged 21-30 years old showed high accessibility score and less average walking time. The female subjects were considered to be in less active mobility status than the male subjects. Those who did not have any occupation had less chance to go outside from home than those who have occupation ($p<0.001$). Person selling lottery and street musician had high average walking time ($p=0.003$). Illiterate subjects showed less accessibility score than educated subjects ($p=0.001$). Subjects came from northeastern Thailand showed less accessibility score than subjects came from Bangkok and other regions ($p=0.007$).

With regard to the history of visual impairment, grade of blindness, age on set of blindness and duration of blindness, which considered to be unchangeable factors, the total blind group showed less accessibility score than the low vision group ($p=0.021$). There was not significant difference between the congenital blind and the acquired blind. However those who developed blindness after 6 years old showed less average walking time than congenital and those who developed until 5 years old ($p=0.008$).

With regard to the environmental factor support from family, community and society and experience of O&M training, which is considered to be improved by same interventions from society, experience of O&M training or mobility related training was considered to be an effective to expand accessibility. Cane skill training and visual therapy were thought to be significant interventions. Cane skill training significantly increased average walking time ($p=0.013$) and improved accessibility score ($p=0.016$). There was significant relationship between visual therapy and accessibility score ($p=0.026$). Total score of social support, composed of instrumental support, emotional support and information support was not correlated with mobility status except for the times go out from home. Over protection by offering excess support for blinds might have correlation with decreasing chance to go out from their home.

Concerning psychological factors, which is considered to be changeable factors, perception of not feeling difficult to travel and easy to go out from home was positively correlated with their accessibility ($p=0.001$). Confident to survive alone was correlated with average walking time ($p=0.030$) and accessibility scores ($p=0.048$). It seems reasonable to suppose that affirmative mental condition toward outside of individual blind can create improvement of mobility status.

In practice with regard to the travelling in Bangkok for the blind, public bus service was listed as a leading cause of their feeling for difficulty and requirement of improvement for the government. Public bus was found to be the most important mode of transportation for the blind (59.3%). More than half (55.8%) of the blind used bus service to go to their working place. However they required for public bus service to equip voice supporting system in the vehicle and at the bus stops as well as the cross street and other public places. In addition, they required some improvement of attention and support for the blinds from the bus drivers and cashiers.

Architecture barrier on the street and sidewalk was the second leading list of difficulty for blinds' travel. This problem will be the task of government to cope with in the future if shortage of budget and appropriate allocation was taken into account.

Direct and indirect financial support and facilities to support the blind's mobility at public places as well as education and creating job were required for the government to mitigate their financial burden.

6.2 Recommendation

After data analysis from this study, there were many remarkable findings that could be used for improvement of the mobility status among the blind which is an important part of the welfare system all over the world in terms of normalization and equal access.

Therefore, there are recommendations for action and for further study presented as follows:

6.2.1 Recommendation for improvement of mobility status among the blind

1. It is difficult to prevent of eye disease but early diagnosis and prompt interventions such as medical treatment with advanced medical technology are important factors to reduce blindness and have chance for better mobility among the total population before talking about rehabilitation.

2. It is inevitable to provide every blind education which emphasis on the O&M training to provide better mobility status. Providing O&M training for the blind is considered to be important element since it not only expand the travel ability of the blind but also create their independence in the society.

Charity and fund-raising to provide better environmental factors exaggerate and sensationalize disability in order to solicit money. Exaggeration and sensationalism of disability can lead to segregation and isolation for persons with disability (42). Therefore O&M training, which enables the blind to achieve

independence, is considered to be most important among those activities such as education for general population, financial support and providing public facilities.

Deferent curriculum between male and female might need to discuss for modification according to the modern socio-cultural background of Thailand since there was significantly different mobility status between male and female.

3. Education for general population how to contact with person with disability is important since their supports had positive relations with mobility status among the blind. Especially person working in transportation service would need training to facilitate binds for more safety and convenient travel, since it is what required by plenty number of the blind. Altered attitude and behavior from general population might be able to affect the psychological factors of blinds that were correlated with the mobility status.

4. It is important to provide direct and indirect financial support as well as insurance system for the blinds since it is not only the factor to expand their availability of transportation but also it can relief the financial problem of blinds.

5. It was requirement from the blind for government to provide public equipment such as voice navigator, Braille, guiding tile, as well as guide person. Improvement of public bus service was considered to be most important point since it was vital mode of transportation for the blind to participate productive activity in society. Condition of street and sidewalk was considered to need improvement for the blind for their safety and convenient travel as well.

6.2.2 Recommendation for further study

1. This study was conducted to assess the mobility status among the blind and find the factors to improve their mobility status. In fact more than 90% of respondents agreed the statement free mobility is also one of the most important factors in the blind's life, therefore mobility is an important factor to create better QOL among blinds.

However it is preferable to assess QOL by means of sophisticated instrument and measurement system to consider about the priority of implementation as government policy or modification of education system.

To assess the psychological factors sophisticated instrument and measurement system such as General Health Questionnaire, Psychological Adjustment to illness Scale, Sickness Impact profile, Acceptance of disability scale and Millon Behavioral Health Inventory, which should be discussed another dimension from this study.

2. Mobility status such as times go out, average walking time and accessibility score were measured as quantitative and subjective data but to know deeply about mobility status among the blind more qualitative approach will be needed. (I.e. participatory observation.) Further more, mobility status was measured with regard to public sphere in this study but to identify it more deeply study regarding domestic sphere will be needed especially mobility of the blind with their daily living at home.

3. Further investigation will be needed to examine that the blind immigrated into Bangkok are much active than the blind staying rural province since only blind who were living in Bangkok metropolis was targeted as respondents in this study.

4. To assess the mobility status precisely according to impairment history more clinical information will be needed such as grading of blindness advocated by WHO, history of development, clinical diagnosis and treatment which will need more case study based on medical record.

5. Every respondent who interviewed in this study started his or her education under the previous educational system before Rehabilitation of Disabled Person Act 1991. Therefore result of this study did not meet the young generation. The longitudinal study is preferable to evaluate the reformation of policy and educational system among the young generation of the blind in Thailand.

REFERENCE

1. Nakanishi Y. Asian disables 4- assessment of environment. Welfare and Labor 2001; 90: 157-62.
2. Sutthi K. Thailand country report on the current situation and the challenge of blind people towards the new decade. Asia Pacific Blind Summit Conference Osaka, Japan, 19-20 October, 2002. Osaka: n.p. 2002.
3. Office of the Committee for Rehabilitation of Disabled Persons, Department of Public Welfare. The rehabilitation plan for disabled person pursuant to the 8th National Social and Economic Development Plan (1997-2001), Draft of National Disabled persons Development Plan 2002-2006) 8th national health development plan take up the master plan (1997-2001). Bangkok: The Department; 2001.
4. Rehabilitation of Disabled Persons Act 1991 and Ministerial Regulations 1994; No.1, 2 and 3. (1994).
5. National Statistical Office. Report on Population change Survey. Bangkok: The Office; 1999.
6. Ministry of Public Health. Thai Public Health Foundation in 1996, Thailand. Bangkok: The Office, 1997
7. Hill EW, Ponder P. Orientation and Mobility Techniques: A guide for the Practitioner. New York: American Foundation for Blind; 1976.
8. Jacobson WH. The art and science of the teaching orientation and mobility to persons with visual impairments. New York: American Foundation for Blind; 1993.
9. Oxford advanced learner's dictionary. Oxford: Oxford University Press; 2002.
10. World Health Organization. ICDIH-2 International Classification of Function and Disability. Beta-2 draft. Short Version. Geneva: The Organization; 1999.
11. Arthur E, Robert P et. Al: Encyclopedia of disability and Rehabilitation. MacMillan Library Reference. n.p. 1995

12. Thailand. Ministry of Public Health. The Health and social welfare survey, 1991. No: Bangkok: The Ministry. 1992.
13. World Health Organization. International classification of impairments, disabilities, and handicaps (ICIDH-1). Geneva: The Organization; 1980
14. Sri-on J. A history of the education of deaf people in Thailand. [PhD. Thesis in Education]. Bundoora, Victoria : National Institute for Deaf Studies and Sign Language Research , Institute of Education, Faculty at Bendigo, La Trobe University; Australia; 2001.
15. The Bangkok School for the Blind. [Brochure].The School; 2002.
16. Frost NA, Sparrow JM, Hopper CD, Peters TJ. Reliability of the VCM1 questionnaire when administered by post and by telephone. Bristol: University of Bristol, Departments of Ophthalmology and Social Medicine, United Kingdom; 2001.
17. Cutsforth. The unreality of words, teachers form 4. New York: American foundation for the blind; 1951.
18. Gendal. Sex education for the blind children: Paper presented at conference on the blind child in social interaction. n.p.; 1973.
19. Scholl. The psychological effect of blindness, New outlook for the blind. 1974
20. Prachanukul V. A survey of perspective of persons with visual impairment and instructors on orientation and mobility training [M.A.Thesis in Rehabilitation Service for Persons with Disabilities]. Nakhon Pathom: : Faculty of Graduate Studies, Mahidol University; 2003.
21. Boonyawantung P. Self-concept and adjustment of visually impaired persona at Pakret Skill Development Center for the blind and Sampran Vocational Training Center for Blind women [M.A. Thesis in Rehabilitation Service for Persons with Disabilities]. Nakhon Pathom: Mahidol University; 2003.
22. Foundation for the Employment Promotion of the Blind. [Online]. 2003 Date of message. Web Site: www.fepblind.ksc.net.th [Accessed 2003 Dec 25]
23. Hill, E: The role of O&M Teacher. [Online]. 2002. Available from: <http://www.ed.arizona.edu/dvi/Posion%20Papers/o&m.htm> [Accessed 2002 Nov 25].

24. Warren. DH. Blindness and children, an individual difference approach. New York: Cambridge University Press; 1994.
25. Falvo DR. Medical and psychosocial aspects of chronic illness and disability. Gaithersburg, MD: Aspen; 1991.
26. Alfafano, Nisen, & Fink,(). Long-term psychological adjustment following head or spinal injury. *Neuropsychiatry Neuropsychol Behav Neurol*; 1993; 6: 117-25.
27. Krause JS,Crew, NM. Chronologic age time since injury, and time of measurement: Effect on adjustment after spinal cord injury. *Arch Phys Med Rehabil* 1991; 72: 91-100.
28. Schulz R, Decker S. Long-term adjustment to physical disability: The role of social support, perceived control, and self-blame *J Pers Soc Psychol* 1985;48: 1162-72.
29. Cobb. Social support as a moderator of life stress. *Psychosomatic Medicine* 1976; 300-14.
30. Kan Antonucci. Convoys over life course: Attachment roles and social support. In: P.B. Baltes, O.Brim, editors. *Life span development and behavior*. Boston: Lexington Press; 1980; (3): 254-86.
31. Vachon W. Social network the crisis of bereavement. *Soc Sci Med* 1977; (11): 35-41.
32. Linda B. *Health psychology: An introduction to behavior and health*. Pacific Grove: Brooks/Cole; 1977.
33. Pinneau. Effect of social support on psychological and physiological stress. University of Michigan, 1975.: Schaefer C, Coyne JC, Lazarus RS. The health related functions of social support. *Journal of behavioral medicine* 1989; (4): 381-406.
34. Cobb. Social support as a moderator of life stress. *Psychosom Med* 1979; (38): 300-14.
35. Chairatananon A. Bangkok transportation analysis: A paper submitted in partial fulfillment of the requirements for UP 572: Transportation and Land Use

- Planning , College of Architecture and Urban Planning , University of Michigan. n.p. 2002. [Unpublished].
36. Thailand. Ministry of Transport and Communications Bangkok Mass Transportation Authority. Communications Authority of Thailand. [Online]. 2003. Available from: www.bmta.motc.go.th [Accessed 2003 Dec 15].
 37. Bangkok Mass Transit System PCL. [Online]. 2003 Available from: www.bts.co.th [Accessed 2003 Dec15].
 38. International committee Japan Federation of the Blind. Persons with visual impairment in Japan 2003. Tokyo: National Committee of Welfare for the blind in Japan. 2003.
 39. Shontz FC. Physical disability and personality: Theory and research. In: W.S. Neff, editor. Rehabilitation psychology. Washington,DC: American Psychological Association; 1971.
 40. Corbett JO, Bregante JL. Disabled lesbians: Multicultural realities. In: M. Nagler, editor. Perspectives on disability. Palo Alto, CA: Health Market Research; 1993.
 41. Roy SC, Roberts SL. Theory construction in nursing : An Adaptation Model. London; Prentice-Hall; 1991.
 42. Smart J. Disability society, and the individual. Gaithersburg, Maryland: Aspen; 2001.
 43. Alberecht GL. The disability business: Rehabilitation in America. Newbury Park, CA: Sage; 1992.
 44. Krause JS, Coker J, Chalifur S, Whiteneck GC. Depression and subjective well being among 97 American Indians with spinal cord injury: A descriptive study. Rehabil Psychol 1999; 44:354-372
 45. Anson CA, Stanwyck DJ, Krause JS. Social support and health status in spinal cord injury. International Journal of Paraplegia 1993; 31: 632-38.
 46. Krause JS. Changes in adjustment after spinal injury: A 20-year longitudinal study. Rehabil Pshychol 1998; 43: 41-55.

47. Heinmann AW, Shontz FC. Adjustment following disability: Representative case studies. Rehabil Couns Bull 1984; 58: 3-14.





APPENDIX A

QUESTIONNAIRES

Date of interview _____ **ID number** _____

Name of interviewer _____

Part I Personal factors and history of visual impairment

Please check “☑” in the appropriate answer according to your opinion.

1. Date of birth _____ Age _____ years
2. Sex Male Female
3. Domicile (Home town)
 - 1. Bangkok 2. Other (specify _____)
4. On set of Blind Congenital Acquired
 (Specify the age of on set _____)
5. Duration of Blind _____ years
6. Type of blindness Total Low vision
7. Other physical impairment Do not have Exist (Specify _____)
8. Education level
 - 1. None 2. Regular primary school
 - 3. Special primary school 4. Regular secondary school
 - 5. Special secondary school 6. College or University
9. Occupation
 - 1. None 2. Teacher or lecturer 3. Selling lottery
 - 4. Masseur or Masseur 5. Fortune teller
 - 6. Telephone operator 7. Singer
 - 8. Other job : (specify _____)

Experience of fall and injury (personal factor)

10. During this year, how many times have you fallen when you are travelling outside?

- 1 None 2 one time
 3 More than one times (specify _____ times)

11. In your adulthood, how many times have you ever been injured by accident when you were traveling outside?

- 1 None 2 one time
 3 More than one time (specify _____ times)

Part II Assessment of Mobility

12. How often do you go out of your home in a week?

- 12:1 Weekday (_____ Times)
 12:2 Weekend (_____ Times)

13. How long do you take a walk on average a day?(_____ hour _____ minutes)

14. What kind of transportation do you usually use to get to your working place?

1. By walk 2. Public bus 3. By car
 4. Train 5. BTS 6. Taxi
 7. Bike taxi 8. Tuk-tuk 9. Others(specify _____)

15. In general how long does it take from your house to your working place?

(_____ hour _____ minutes)

16. What is the most difficult point when you are travelling in Bangkok metropolis?

17. Accessibility

Please check “☑” in an appropriate answer according to your opinion.

How do you think to access following places alone? (Please assume if you have enough money and time and you have to go there according to your need.)

E=Easy ND=Not decided D=Difficult

If it is not easy, how do you think to access the places with sighted guide?

E=Easy ND=Not decided D=Difficult

(Please check “☑” in lower column)

If partial blind, indicated only self accessibility.

If total blind, indicate both self mobility and assist mobility.

| Place | Travel mode | E | ND | D |
|---------------------------------------------|--------------------|---|----|---|
| Department store | Alone | | | |
| | With sighted guide | | | |
| Market | Alone | | | |
| | With sighted guide | | | |
| Buffet (in door) or Eating house | Alone | | | |
| | With sighted guide | | | |
| Governmental office | Alone | | | |
| | With sighted guide | | | |
| Hospital | Alone | | | |
| | With sighted guide | | | |
| Post office | Alone | | | |
| | With sighted guide | | | |
| Berber , Hair dresser | Alone | | | |
| | With sighted guide | | | |
| Social Welfare council | Alone | | | |
| | With sighted guide | | | |
| Office of Thai National Institute for Blind | Alone | | | |
| | With sighted guide | | | |

18.Availability

18.1: what is the type of transportation do you usually use most for your daily life?

- 1:Public bus 2:Train 3:Bike taxi
- 4:Tuk-Tuk 5:Taxi 6:BTS
- 7:Others(specify_____)

18.2: How long does it take to the terminal? (_____minutes)

18.3: How long on average do you have to wait at the waiting place? (_____minutes)

18.4: Is it difficult for you to get on the vehicle at the terminal?

- 1:Very easy 2:Easy 3:Not decided
 4:Difficult 5:Very difficult

18.5: How do you feel about the fare of the vehicle?

- 1:Very cheap 2:Cheap 3:Not decided
 4:Expensive 5:Very expensive

Part III Environmental factors

Instrumental support

19-30 Please check “” in the appropriate answer in your opinion.

SD= Strongly disagree D= Disagree N= Not decided A= Agree SA= Strongly agree

| Statement | SD | D | N | A | SA |
|------------------------------------------------------------------------------------------|----|---|---|---|----|
| 19. People always help you to get on/off the vehicle | | | | | |
| 20. People not always give you their hands when they are walking across the street | | | | | |
| 21. People always help you to go up stairs in public place any time when you want. | | | | | |
| 22. Your family members (or friends) not always accompany with you when you are outside. | | | | | |

Emotional support

| Statement | SD | D | N | A | SA |
|---------------------------------------------------------------------------------------------------------------|----|---|---|---|----|
| 23. Your family members (or friends) are sympathetic enough to listen to your suffering, hardship or anxiety? | | | | | |
| 24. People in Bangkok ignore you when you need support for your travel | | | | | |
| 25. Your family member (or friends) always encourage you when you are sad | | | | | |
| 26. Your family members (or friends) always support you by providing you their time for your counseling | | | | | |
| 27. People without disability around you are well understanding your suffering in your life | | | | | |

Information support

| Statement | SD | D | N | A | SA |
|---------------------------------------------------------------------------------------------------------------|----|---|---|---|----|
| 28. People in Bangkok are kind enough to inform you the direction in your travelling situation? | | | | | |
| 29. Your family members (or friends) always tell you about the news or information related to you | | | | | |
| 30. Public facilities such as Braille or Voice system are enough for you to access the daily life information | | | | | |

Experienced special training or education

Please check “☑” in the appropriate answer in your opinion.

31. Did you know that there is an Orientation & Mobility training?

- 1.Yes 2.No

32. Please answer if you have ever experienced following interventions related with Orientation and Mobility improvement.

Please check “☑” in the appropriate answer in your opinion.

E= Experienced NE= Not Experienced

| Intervention | E | NE |
|------------------------------------------------------------------------------|----------|-----------|
| 32.1 O&M training or Mobility related training | | |
| 32.2 Early treatment from ophthalmologist when your blindness was recognized | | |
| 32.3. Cane skills training | | |
| 32.4 Informed consent about the disorder in your vision system | | |
| 32.5 Visual therapy | | |
| 32.6 Daily living skills | | |

33. Have you got Orientation and Mobility training from your family or your own community level before you enter primary school?

- 1.Yes 2.No

Part IV Psychological factors

Perception of environmental factors

34-40. **Please check “☑” in the appropriate answer in your opinion.**

| Statement | SA | A | N | D | SD |
|--------------------------------------------------------------------------------------------------------|-----------|----------|----------|----------|-----------|
| 34. You feel it is difficult and uncomfortable when you are traveling around Bangkok. | | | | | |
| 35. You are confident to survive without any support from other people around you. | | | | | |
| 36. You always feel isolated from society and seem to be meaningless. | | | | | |
| 37. It is easy for you to go out of your home? | | | | | |
| 38. You always feel prejudice or discrimination from people in society. | | | | | |
| 39. You think that free mobility is one of the most important factors in your life. | | | | | |
| 40. When you were young, your parents always overprotected you and did not take you out of home often. | | | | | |

PartV

If you (interviewer) feel this responder is active person among blind please ask Question 39. If you think he is rather inactive ask Question 40.

41. What is your motivation to go out from your house?

42. What is the reason why you prefer to stay at home?

43. What do you think toward the support for blinds from the Thai government?

44 . What do you want or suggest for the Thai government policy to help the blinds for their mobility outside home?

Thank you very much for contribution for this research

BIOGRAPHY

| | |
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