



THE THIRD
NATIONAL HEALTH AND MORBIDITY SURVEY
2006
(NHMS III)

PHYSICAL DISABILITY

INSTITUTE FOR PUBLIC HEALTH
NATIONAL INSTITUTES OF HEALTH
MINISTRY OF HEALTH
MALAYSIA
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JANUARY 2008**

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THE THIRD NATIONAL HEALTH AND MORBIDITY SURVEY 2006 (NHMS III)

PHYSICAL DISABILITY

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Ministry of Health Malaysia.*

MESSAGE FROM THE DIRECTOR GENERAL OF HEALTH MALAYSIA

Since independence, Malaysia has achieved remarkable progress economically and socially, notably in the health sector, through a well planned and comprehensive health care delivery system. However, Malaysia's health care system still has to grapple with many challenges, particularly the rising costs of health care and the increasing demands and expectations for quality care by our consumers. In this respect, the Ministry of Health formed the 'National Institutes of Health' to spearhead health research that will provide the body of evidence to help formulate health policies and create new tools to measure health impacts arising from the series of interventions made in the provision of health care. This will lead to an environment of better governance.

The first National Health & Morbidity Survey (NHMS) was conducted in 1986 by the Institute for Public Health (IPH) which is currently one of the research organizations under the umbrella of the National Institutes of Health (NIH). IPH was also given the task of conducting the second NHMS II in 1996 and the current NHMS III in 2006. Data and information gathered by these surveys are consistently and extensively been used by the Ministry of Health in formulating the Malaysian Health Plans and evaluating the intervention programmes.

The publication of the current NHMS III report would generate much interest amongst of all health care stakeholders in the country as well as international health organizations. It is my sincere wish that the data and information generated by NHMS III be fully distributed, discussed and utilized to enhance further the provision of health care in this country. The data generated on the national health and health-related prevalence would be useful in assessing the national health burden as well as allowing for international comparison of health systems achievements.

I would like to take this opportunity to congratulate all those directly involved in the conduct of the survey, namely members of the National Steering Committee, the Advisory Committee, Research Groups and the Working Committee for their untiring efforts in the planning and conduct of the survey as well as publication of the reports. I would like to specially place on record the Ministry's appreciation of the excellent work done by the Principal Investigator and his team and for their dedication and tenacious efforts in spearheading this project to fruition. The Ministry of Health is committed to conduct these National Health and Morbidity Surveys on a regular basis and hope that IPH will continue to provide the leadership in conducting future National Health and Morbidity Surveys in this country.

Thank you.



Tan Sri Datuk Dr Hj. Mohd Ismail Merican
Director General of Health, Malaysia.

MESSAGE FROM THE DEPUTY DIRECTOR GENERAL OF HEALTH (RESEARCH AND TECHNICAL SUPPORT)

The Research and Technical Support Programme of the Ministry of Health emphasizes the need for research in supporting decision making and planning the activities in the Ministry. Only then can we ensure that every decision made either in planning resources or providing services to the people is supported by evidence based information and ensuring better results and outcome. We would certainly prefer local expertise rather than depend on foreign experts to carry out local research.

Under the umbrella of the National Institutes of Health, the Institute for Public Health has actively been involved in conducting research in public health and the National Health and Morbidity Survey is one of the major research conducted by IKU. This is the third time IKU has been given the responsibility to conduct such a mammoth task. I am very pleased that a lot of improvement have been made in the way this survey was conducted based on the experience learnt during the first and second surveys. However, due to the nature of the community survey, not all diseases and health issues were able to be covered in this survey. The research teams had to conduct an extensive literature reviews for relevant and up to date information on the health status of the Malaysian population.

I believe that the information in these reports are extremely valuable to all decision makers at the National State and district levels as well as those interested in the health of the Malaysian population. It can be a tool in providing guidance in developing and implementing strategies for the disease prevention and control programme in Malaysia.

I would like to take this opportunity to congratulate the research team members who have successfully undertaken and completed this survey. I would also like to thank all individuals and agencies who directly or indirectly made the completion of this survey possible.

The Institute for Public Health again gained a feather in its cap by successfully completing the Third National Health and Morbidity Survey.



**Datuk Ir. Dr. M. S. Pillay,
Deputy Director General of Health (Research and Technical Support).**

MESSAGE FROM THE DIRECTOR OF INSTITUTE FOR PUBLIC HEALTH

This is the third time the Institute for Public Health (IPH) was given the task to conduct the National Health and Morbidity Survey. The frequency of the study is every 10 years and I am proud that the Institute is able to conduct the surveys successfully since it was first initiated in 1986.

I would like to take this opportunity to thank the Director-General of Health Malaysia, Tan Sri Datuk Dr. Hj. Mohd Ismail Merican, and the Deputy-Director General of Health (Research and Technical Support), Datuk Ir Dr.M.S. Pillay, whose invaluable support and guidance were instrumental in the successful completion of the third National Health and Morbidity Survey (NHMS III). Our appreciations are also extended to all members of the Steering Committee and the Advisory Committee of NHMS III.

I would like also to take this opportunity to congratulate the Principal Investigator and his Project Team Members in completing the NHMS III study and the publication of its report. The NHMS III was made possible through the collaboration of all agencies. The meetings, workshops and conferences that were organised, met their intended objectives and the hard work put up by the field staffs, ensured the three months data collection productive and successful.

My sincere gratitude also goes to Dr.Nirmal Singh, the former Director of the Institute for Public Health, Chairman of the Advisory Committee for his continuous support and guidance which contributed towards the successful completion of the study.

I hope the documentation of this report will be beneficial for future reference.

Finally, I would like to thank all those involved in the survey for a job well done, in making the NHMS III a success and finally producing the national report of this survey.



**Dr. Yahya Baba,
Director, Institute for Public Health.**

MESSAGE FROM THE PRINCIPAL INVESTIGATOR NHMS III

It is indeed a challenging task when the responsibility was given to me to conduct this survey. I learned the hard way and gained a lot of valuable experience in leading the survey. The survey also taught me lots of new techniques and how it should be addressed which is not available in the textbook. In doing so, I also learned the meaning of friendship and honesty, how to manage people involved and manage properly the given budget.

I would like to take this golden opportunity to thank the Director General of Health Malaysia, Tan Sri Datuk Dr. Hj. Mohd Ismail Merican, Chairman of the Steering Committee for giving me the confidence, valuable support and guidance for the success of this survey.

I would also like to thank the Deputy Director General of Health Malaysia (Research and Technical Support), Datuk Ir. Dr. M.S. Pillay as Co-chairman of the Steering Committee for his patience in seeing through the survey until its completion the production of the national report.

My sincere appreciation to current Director of Institute for Public Health (IPH), Dr.Yahya Baba and former Directors of IPH, Dr.Nirmal Singh, Dr.Sivashamugam and Dr.Sulaiman Che Rus for their trust in me to carried out this survey. Their support for the survey has resulted the smooth conduct and success of the survey.

Special thanks to all State Directors, State Liaison Officers, Field supervisors, Scouts, Data Collection Team members for their full cooperation and efforts to ensure the success of the data collection. My appreciation is also extended to the Assistant Principal Investigator, Dr.Mohd Azahadi Omar, Main Research Group members, members of the Working Committee, Data Management group members, Statistics Consultant, Research group members , Research Officers and Research Assistants for their patience and tolerance of my behaviour to ensure the success of the study. Nevertheless I acknowledge a lot more can be done in strengthening the study.

I believe this report will serve as a useful reference for future surveys and helps in improving the local data sources and also add new valuable information for the Ministry of Health to use in the planning process. I also would like to encourage all research members to participate in further analysis of the data and publish the findings in peer review journals.

Thanks to everyone.



**Dr. Hj. Ahmad Faudzi Hj. Yusoff,
Principal Investigator, The Third National Health and Morbidity Survey,
Institute for Public Health.**

*A***UTHOR'S STATEMENT**

This volume is the culmination of several months of collaborative effort by the authors who have strived to ensure integrity of this work. Please note that the findings of this volume have been adjusted for difference in population composition between the survey sample and the 2006 projected population in Malaysia. The authors welcome any enquiries, comments and suggestions for similar studies in the future.

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This report would not have been possible without the ideas and insights gained from previous NHMS studies.

We, the researchers, wish to express sincere gratitude and appreciation to the:

- Third National Health and Morbidity Survey Steering Committee and Advisory Committee
- Directors of all State Health Departments
- Local Authorities
- Dean, Faculty of Medicine, Universiti Kebangsaan Malaysia
- Dean, Faculty of Medicine, University of Malaya
- Director, Hospital Kuala Lumpur
- Chief Executive Officer, Sunway Medical Centre, Petaling Jaya
- Director, Family Health Development Division, Ministry of Health
- Director, Institute for Public Health
- Principal Investigator, Third National Health and Morbidity Survey
- All individuals who have been involved directly or indirectly in this research project.

Expertise and useful comments from reviewers and editors are gratefully acknowledged. However, any errors and omissions are those of the authors.

ABSTRACT

Introduction: Disability is a complex collection of conditions with significant impact on function and quality of life of those affected by it, hence requiring multifaceted services across ministries and agencies.

Objective: To determine the magnitude and impact of physical disability in the Malaysian population

Method: Cross-sectional population-based household interview with two-stage stratified sampling design.

Results: The overall prevalence of physical disability was 6.3 per 1000 population. It increased with age, with male more affected than female. Almost one third of individuals with physical disability were from households living below poverty line. There was no significant difference in terms of rural-urban distribution and ethnicity. Majority were due to acquired causes, however this varied with the age group categories. Physical disability had significant impact on the functional independence in personal and domestic activities of daily living (ADL), mobility and communication and this varied with the age group and the severity of the disability. Among *children* with physical disability aged 7 to less than 18 years, almost 40% of them had no verbal communication, 31.5% had not attended formal education and 21% were housebound. For the *adults* with physical disability aged 18 to less than 60 years, 9 to 31% reported being partially or totally dependent on others for their core functional activities. They found increasing difficulty in performing these activities in the following order: eating, bathing, dressing, use of toilet, mobility and doing housework. A huge proportion (40%) of adults with physical disability was unemployed. They were also prone to injury at home and at workplace. Among the *older persons* with physical disability aged 60 years and above, the greatest impact on functional independence was on their mobility and domestic ADL, with almost two third of them needing partial or full assistance in these areas. The impact was accentuated with age and severity of the physical disability. In this survey we found that 68% of individuals with physical disabilities were not registered with the Department of Social Welfare. Majority (59.1%) had never participated in any rehabilitation programmes. From this survey, the main caregivers identified were spouses, daughters, sons and mothers.

Conclusion: Results of the NHMS III survey on physical disability show a two fold increase in the prevalence of physical disability over the past ten years It has identified the areas of needs and burden of care and emphasized again that these problems require multisectoral involvement and commitment from the government, non-government and private agencies.

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ABBREVIATIONS

AAC	Augmentative and Alternative Communication
AAQ	Amount of Assistance Questionnaire
ABS	Australian Bureau of Statistics
ADL	Activities of Daily Living
DE	Design effect
DISTAT	United Nations Disability Statistics Database
DSW	Department of Social Welfare
EB	Enumeration Blocks
FI	Face to face interview
FIM	Functional Independence Measure for Adults
ICF	International Classification of Functioning, Disability and Health,
ID	Individual identification
ISIS	Institute of Strategic and International Studies
LPPKN	Lembaga Penduduk dan Pembangunan Keluarga Negara
LQ	Living Quarters
NCD	U.S National Council on Disability
NCSHCN	National Survey of Children with Special Health Care Needs
NCSPES	Children with Special Health Care Needs
NHMS	National Health and Morbidity Survey
PD	Physical Disability
PPS	Probability Proportionate to Size
RR	Response rate
WeeFIM	Functional Independence Measure for Children
WHO	World Health Organization

1. INTRODUCTION

Disability is an important dimension of health-related quality of life. Estimating prevalence rates for particular disability groups can provide statistical measures that may be used as broad indicators of need for services including disability support, rehabilitation, prevention and mainstream services. It is desirable that the estimates should also provide information that can be used to facilitate the removal of social and economic barriers that can affect a person's full participation in community life. Opportunities for functional independence, education, employment, recreation, participation in community activities and others depend to a great extent on provision of appropriate services that can be accessed by an individual with disability and his family. In Malaysia, such services are the responsibility of multiple sectors including health, social, education, manpower, transport, sports and others. Hence, the framework used for determining the database on disability must have the capacity to be used to plan out such services.

In National Health and Morbidity Survey (NHMS) II, the prevalence of impairment and disability were measured and functional capabilities were identified only through Activities of Daily Living (ADL) at personal level. The NHMS III puts emphasis on the impact of disability on education, employment, community participation, access to internet, by encompassing questionnaire design and tools alluded to by the International Classification of Functioning, Disability and Health (ICF). Disability is not an attribute of an individual, but rather a complex collection of conditions, many of which are created by the social environment. Hence, management of disability requires a multidisciplinary action approach including health, social and political. It is the collective responsibility of society at large to enable full participation of people with disabilities in all areas of life.

In NHMS II, the prevalence of overall impairment and disability were 6.9% and 1.5% respectively. The prevalence of physical impairment was 0.32% (3.2 per 1000 population). In the past decade, in Malaysia, much attention has been paid to visual and hearing impairment e.g. The National Eye Survey (1996), and that of Ear and Hearing Disorders Survey (2005). The results of such surveys served as basis for the development of services for the visually and hearing impaired. Similarly, the NHMS III which focuses on physical disability will produce data which can be specifically used for planning services for those affected.

2. LITERATURE REVIEW

To estimate the prevalence of physical disability, it is necessary to develop a basis for its identification. The diversity of survey methods available indicates a need for an internationally agreed conceptual approach to disability survey screening procedures in order to produce internationally comparable data on the prevalence of disability. Nevertheless, international data appear to show that physical disabilities are the most commonly reported disabilities. For example, the 1987 national disability survey of Spain estimated that 60.2% of people with a disability reported physical impairments as their underlying condition (Chamie 1995). Data from the 1989 Survey of National Registry of Germany showed that underlying physical conditions were reported by about 70% of all people with a severe disability receiving rehabilitation services (Chamie 1995).

The Australian Bureau of Statistics (ABS) survey of Disability, Ageing and Carers Disability in 1993 estimated that 18% of the Australian population had a disability, defined on the basis of a positive response to one or more of 15 screening questions. The ABS grouped disabling conditions into two broad categories: mental disorders and physical conditions. 'Physical conditions' covers all conditions other than mental disorders, including disorders of eyes and ears, and head injury, stroke and other brain damage. 'Mental disorder' covers mental psychoses and all other mental disorders including intellectual impairment. 'Physical impairments' are identified by a positive response to screening questions about restriction in physical activity or work, difficulty gripping or holding things, lack of full use of arms or fingers, and lack of full use of feet or legs. Using the ABS grouping of disabling conditions, physical disabling conditions were reported as the main disabling condition by 16% of the Australian or 88.9% of people with disability. Based on the ABS impairment type groups, 10.3% of the Australian population, or more than half of all people with a disability had a physical impairment, either alone (30%) or in combination with other impairments (27%).

In 1993, 9.8% of the Australian population, with a disability reported a physical 'main disabling condition'. Of these, 423,100 people, or 2.6% of the total Australian population aged 5 years and over, also had a severe or profound handicap, meaning that they always or sometimes needed personal assistance or supervision with activities of daily living (self-care, mobility or verbal communication). Arthritis was the most commonly reported physical 'main disabling condition', followed by other musculoskeletal disorders. For people aged under 65 years, 6.7% of Australians in that age group, reported a physical 'main disabling condition'. Of these, 6.7% of Australians aged 5 to 64 years, had a severe or profound handicap.

In 1987, China's State Council established a disability classification system with five sub-classifications for the national census (Qiu 1998). They are visual impairment, hearing and speech impairment, mental retardation, physical handicaps and mental disorder. The "Physical handicaps" sub-classification was further divided into four categories namely:

- i. Loss of upper or lower limbs due to trauma, disease or congenital factors.
- ii. Anamorphosis or dysfunction of upper or lower limbs due to trauma, disease or congenital factors.
- iii. Anamorphosis or dysfunction of spinal cord.
- iv. Anamorphosis or dysfunction of trunk or limbs due to trauma, disease or congenital factors.

They can be graded based on the parts and degrees of disability and functional barriers.

Categories	Grading	Standard
1	0~2	complete loss of ADL
2	3~4	basic loss of ADL
3	5~6	partial maintaining of ADL
4	7~8	basic maintaining of ADL

With a sample size of 1,579,316, the total number of population with disability was 88,763 and percentage of physical handicap was 16.30%.

The United States Census Bureau defines disability as a long-lasting sensory, physical, mental, or emotional condition. This condition can make it difficult for a person to do activities such as walking, climbing stairs, dressing, bathing, learning, or remembering. It can impede a person from being able to go outside the home alone or to work at a job or business, and it includes persons with severe vision or hearing impairments. In the 2004, American Community Survey, disability questions posed were limitations in Sensory, Physical, Cognitive Functioning ("Mental Disability"), Self-Care, Going-Outside-Home and Employment. The Census Bureau uses the six disability items above to determine an individual's disability status in some of its data products such as in the ACS Detailed Tables and the Disability Profile. In the 1999-2004 American Community Survey, people aged 16-64 were classified as having a disability if they reported at least one of the above six conditions. People aged 5-15 were classified as having a disability if they reported any one of the four conditions: sensory disability, physical disability, mental disability, or self-care disability. People over 65 were classified as having a disability if they reported any one of the five conditions: sensory disability, physical disability, mental disability, self-care disability, or go-outside-home disability.

In the context of NHMS III, the term 'physical disability' is used for individuals with physical impairment with or without limitation in functional independence or participation restriction. Physical impairment refers to a problem in body function or structure involving the head, face, neck, upper or lower limbs. A functional approach was also taken to identify disability in the community for example paraplegia (loss of function of both limbs) and bilateral amputee (anatomical loss of both lower limbs) was in the same group. This is to facilitate interviewers who are not medically trained to identify disability with reasonable ease. Furthermore, it allows us to indirectly quantify the severity of physical disability experienced by the respondents.

3. OBJECTIVES

3.1 General Objective

To determine the magnitude and impact of physical disability in the Malaysian population.

3.2 Specific Objectives

3.2.1 To determine the prevalence of physical disability in the population

3.2.2 To identify the causes and types of physical disability

- 3.2.3 In the children's group, to determine the impact of physical disability on :
- a) Functional independence in the domains of ADL and mobility
 - b) Communication
 - c) Education
 - d) Access to public places
 - e) Safety from injuries at home / road / recreational area/school
- 3.2.4 To determine the socio-demographic characteristics of adults (18 - < 60 years) with physical disability
- 3.2.5 In the adult group, to determine the impact of physical disability on :
- a) Functional independence in the domains of ADL and mobility
 - b) Communication
 - c) Access to public places
 - d) Access to internet
 - e) Safety from injuries at home / road / recreational area / workplace
- 3.2.6 In the older person group (60 and above), to determine the impact of physical disability on :
- a) Functional independence in the domains of ADL and mobility
 - b) Communication
 - c) Access to public places
 - d) Access to internet
 - e) Safety from injuries at home / road / recreational area
- 3.2.7 To determine the proportion of individuals with physical disability (all age groups) registered with Department of Social Welfare and to identify reason(s) for not registering.
- 3.2.8 To identify the pattern of utilization of rehabilitation services among individuals with physical disabilities
- 3.2.9 To identify the main caregivers for individuals with physical disability

4. METHODOLOGY

4.1 Scope of the Study

Research problems, scopes and main issues to be included in NHMS III were obtained from discussions and feedbacks from Ministry of Health state health managers, as well as experts from the local universities and individuals. The main research team members of the NHMS III reviewed and studied closely the feasibility and practicality of the suggested research topics for this community-based household survey. Extensive literature review was initiated. Technical and research experts in relation to the identified research areas were consulted for further advice and comments. The main research group used the following criteria in considering the suggested scopes for this survey:

- a) The issue/problem is of current or potential high prevalence
- b) The issue/problem is focusing on disease/disorders associated with affluence, lifestyle, environment and demographic changes.
- c) The issue/problem is causing physical, mental or social disability
- d) The issue/problem has important economic implications
- e) It is feasible to implement interventions to reduce the problem
- f) The information required related to the issue/problem is not available through the routine monitoring system or other sources.
- g) The information is more appropriately obtained through a nation-wide community survey, and
- h) It is feasible to obtain through a nation-wide community-based survey.

The short-listed research topics then presented to the Advisory Group Members for further deliberation and decisions. These topics were later refined by the research team members based on the decisions made at the Advisory Committee meeting. It was tabled to the Steering Committee and 18 research topics were approved to be included in the NHMS III.

4.2 Sampling Design and Sample Size

In calculating the sample size, stratification and sampling design, advice was sought from the Methodology Division Department of Statistics Malaysia as well as from several other biostatistics consultants.

4.2.1 Sampling frame

The sampling frame for this survey was updated until 2004; an effort undertaken prior to the implementation of Labour Force Survey (LFS) 2004. In general, each selected Enumeration Blocks (EB) comprised of 8 sampled Living Quarters (LQ). The EBs was geographically contiguous areas of land with identifiable boundaries. Each contains about 80-120 LQs with about 600 persons. Generally, all EBs are formed within gazetted boundaries.

The EBs in the sampling frame was also classified by urban and rural areas. The classification into these strata was made up in terms of population of gazetted and built-up areas as follows:

Stratum	Population of gazetted areas and built-up
Metropolitan	75,000 and above
Urban Large	10,000 to 74,999
Urban Small	1,000 to 9,999
Rural	The rest of the country

For sampling purposes, the above broad classification was found to be adequate for all states in Peninsular Malaysia and the Federal Territories of Kuala Lumpur and Labuan. However, for Sabah and Sarawak, due to problems of accessibility, the rural stratum had to be further sub-stratified based on the time taken to reach the area from the nearest urban centre.

For the purpose of urban and rural analysis, Metropolitan and Urban Large strata are combined together thus referred to as 'urban' stratum, while for Urban Small and the various sub-divisions of the rural areas they are combined together to form to a 'rural' stratum.

4.2.2 Sampling design

A two stage stratified sampling design with proportionate allocation was adopted in this survey. The first stage sampling unit was the EB and within each sampled EB, the LQs were selected as second stage unit. One LQ was estimated to comprise of 4.4 individuals. All households (HH) and persons within a selected LQ were studied.

4.2.3 Sample size

The sample size was determined based on 95% Confidence Interval (CI) and the following factors were taken into consideration:

a) **Expected Prevalence Rate**

The prevalence rate of the health problems for Malaysia obtained from the National Health and Morbidity Survey 2 (NHMS2) were used to estimate the overall sample size. Using the previous finding of 10% prevalence rate, the initial sample size at the state level was calculated in order to come up with overall sample size. The size was further apportioned for each state using the probability proportionate to size (PPS) method.

b) **Response Rate of the NHMS2**

The response rates, which ranged from 83 to 97% for the NHMS2 of each state, were taken into consideration in the course of the determination of sample size.

c) Margin of Error and Design Effect

As the factors of precision and efficient of the survey are paramount, the decision reached for the targeted margin of error is 1.2 and the design effect valued at 2. These values were used at the initial stage of the calculation of the sample size of each state.

The survey findings answering to the specific objectives of this survey are expected to be used for state level programmed planning. Thus, the calculation for the sample size has taken into consideration that the data is to be analyzed at the state level.

In addition to the major factors mentioned earlier, the availability of resources, namely, financial and human resources, and the time taken to conduct this survey also become part of the process of the determination of sample size.

4.3 Preparation of Field Areas and Logistic Support

A number of state liaison officers were recruited in preparation for the survey proper. Strong networking with state liaison officers and District Health Officers (MOH and local authorities) from the areas sampled for the survey was established. Field scouts were mobilized from these areas to identify and tag the LQ's selected for the survey, as well as informed to the community and related government agencies of the importance and schedule of the planned survey. State liaison officers were also assisting Field Supervisors in the arrangement of transportation, accommodation and other logistics for the survey teams.

4.4 The Questionnaire, Household Interview and Examination Procedure

4.4.1 The questionnaire

A bi-lingual (*Bahasa Malaysia* and English) pre-coded questionnaire was designed, pre-tested and piloted prior to the survey. All research topics for the questionnaire are arranged into modules ranging from A to Z. Topics that are similar area are arranged into sub-modules under a particular module. Questions comprised of both close ended and open ended. The questions in each module were tailored to the target group.

The face-to-face interview (FI) questionnaires consisted of two subtypes, i.e., the household questionnaire (orange) to be answered by the head of the household of the LQ selected, and the individual questionnaire to be answered by each member of the household. Two types of individual questionnaire were developed, to cater to the different age groups of 13 to less than 18 years old (yellow) and 18 years old and above (purple).

Those aged 13 years and above were required to answer their respective questionnaires directly through the interview.

All the FI questionnaires have a consent form to be read and signed by the respondent or parent / guardian of the respondent. The outside cover of all questionnaires had to be filled with a unique individual identification (ID) number by the enumerator. The enumerator also had to fill his or her ID as well as the code for the outcome of the interview as part of the quality assurance process.

4.4.2 The interview

As far as possible, all adult members who qualify from the selected LQ's were interviewed by the data collection team members. Parents or guardians were expected to provide information for their children aged 12 years and below (primary school). Interviews commenced early in the morning and lasted till late in the evening. A trained non-medical or paramedical interviewer conducted the interview. Where an interview had been unsuccessful due to the absence of the respondent at the selected LQ, repeat visits were conducted after leaving messages with neighbours or by other means for an appointment at a later date. A household member can only be classified as a non-responded after 3 unsuccessful visits.

4.5 Field Preparations

Two main survey implementation groups had been formed: the Central Coordinating Team (CCT) and the field team. The CCT's main role was to monitor and coordinate the progress of implementation and provide administrative support in terms of financial and logistic arrangement for the field survey. The Field Teams were responsible to oversee and manage the field data collection process as well as undertake quality control.

The field data collection was conducted throughout Malaysia simultaneously, spanning within a continuous period of 4 months starting from April 2006. Teams were organized to move into 5 regions in Peninsular Malaysia, 2 regions in Sabah and 4 regions in Sarawak for data collections.

4.5.1 Pilot study

A pilot study was conducted on a sample of EB's (not included in the NHMS III) about 2 months prior to the actual nationwide survey. It was conducted in three different areas in and around the Klang Valley, namely Sepang, Klang and Bangsar. The population in these locations comprised of three distinct socio-demographic strata that are rural, semi-urban and urban respectively. The pilot study focused on the following aspects of the survey such as testing of the questionnaire, testing of the field logistic preparation, testing of the scouting activities and testing of the central monitoring and logistic support.

4.5.2 Training of data collection teams

A two weeks training course was held for field supervisors, team leaders, nurses and interviewers to familiarize them with the questionnaire, develop their interpersonal communication skills and appreciate the need for good teamwork. Briefing on the questionnaire, mock interview in the classroom and individual practice under supervision was conducted during the training.

4.6 Quality Control

Quality control procedures for the data collection were done at two stages, field and central. Detail description of quality control process has been described in NHMS III protocol.

4.7 Data Management

4.7.1 Data screening

The following data screening exercises had been conducted at field and central levels prior to data entry:

- a) Field data screen by each interviewers at the end of his/her interview.
- b) Field data screen of each question by peer interviewers through exchanging questionnaire booklets.
- c) Field data screen by team leaders and field supervisors.
- d) Central data screening of the questionnaire by the quality control team.

4.7.2 Data entry

The data entry system was developed to record the information collected during the data collection phase. It is a web based system that allows multiple simultaneous accesses to the database. The NHMS III used a double manual data entry method and any discrepancy between both entries was verified by the supervisors. The data entry started simultaneously with data collection (first week of April 2006) and was completed at the end of January 2007. The data entered was stored in the database according to the module. The databases were designed using Structured Query Language (SQL) which is a standard language for relational database management system.

4.7.3 Data analysis

Data analysis was done by exporting the data into other analysis tools such as Microsoft Excel, SPSS and STATA. The data in database (text form) was exported to the Microsoft Excel form then to the SPSS and STATA. The raw data was cleaned and analysed according to the terms, working definition and dummy table prepared by the research groups. All the analysis process were monitored and advised by the NHMS III Statistics Consultant.

4.8 Definition of Terms

4.8.1 Disability (as defined in ICF, 2001)

Is an umbrella term encompassing impairment, activity limitation or participation restriction.

4.8.2 Impairment (as defined in ICF, 2001)

Problem in body function or structure such as significant deviation or loss.

4.8.3 Physical impairment

Problem in body function or structure involving the head, face, neck, upper or lower limbs.

4.8.4 Physical disability

In the context of this survey, the term 'physical disability' is used for individuals with physical impairment with or without limitation in functional independence or participation restriction.

4.8.5 Functional independence

Functional Independence is the ability to perform daily living tasks without help (Braddom 2006). In this survey, functional independence encompasses domains of communication, mobility and activity of daily living.

a) Communication

Communication skills are used to convey information including thoughts, needs and emotions. This can include writing, physicality (sign language, gestures, body language) and alternative and augmentative communication aids (word board, pictures).

b) Mobility

Mobility is the ability to move about in one's environment. Mobility encompasses bed mobility (turning from side to side, going from the prone to supine positions, sitting up and lying down), wheelchair mobility and ambulation (ambulation with or without aids).

In the context of this survey:

- i. Independence in mobility means ability to walk unaided.
- ii. Partial dependence in mobility is when an individual
 - Is able to walk with assistance
 - Is able to walk with aids (furniture, walking aids, prostheses)
 - Is able to move about in a wheelchair
 - Has modified mobility (bottom shuffle, crawl, creep)
- iii. Total dependence in mobility is when an individual:
 - Needs to be carried around by a caregiver
 - Hardly moves around or bed bound

In this survey, those who are totally dependent in any of the three domains of functional independence i.e. communication, mobility and ADL are considered to have severe functional disability.

In this survey, we did not differentiate between an individual who can propel a wheelchair independently or needed assistance from a caregiver.

c) Activities of Daily Living (ADL) encompass

- i. Personal ADL i.e. feeding, dressing, grooming, bathing and toileting.
- ii. Domestic ADL i.e. cooking, cleaning, housekeeping, washing clothes, gardening etc.
- iii. Community ADL i.e. going to public places including schools, attend social and religious functions.

Functional Independence can further be categorized into;

- i. Independent which means no helper is required
- ii. Partial dependence which means a person requires some assistance
- iii. Total dependence which means person is unable to perform any of the related task

4.8.6 Caregivers

Caregivers are individuals paid or unpaid, who assist or help individuals who are partially or totally dependent to perform activities in the domains of communication, mobility or ADL. This may include parents, spouse, children, siblings, relatives, paid domestic maids, nurse assistants and others.

4.8.7 Rehabilitation

Rehabilitation of people with disabilities is a process aimed at enabling them to reach and maintain their optimal physical, sensory, intellectual, psychological and social function levels. Rehabilitation provides disabled people with the tools they need to attain independence and self-determination (WHO 2007)

In the context of this survey, rehabilitation is a process aimed at maximising functional independence for persons experiencing physical disability as a result of injury, illness or a developmental condition.

5. FINDINGS

Total number of eligible respondents was 56,710, however only 55,716 responded giving a response rate of 98.3%.

5.1 Prevalence of Physical Disability

The overall prevalence of physical disability was 6.3 per 1,000 population (0.63%). It increased with age especially after the age of 50 and peaked after the age of 75 (Figure 5.1).

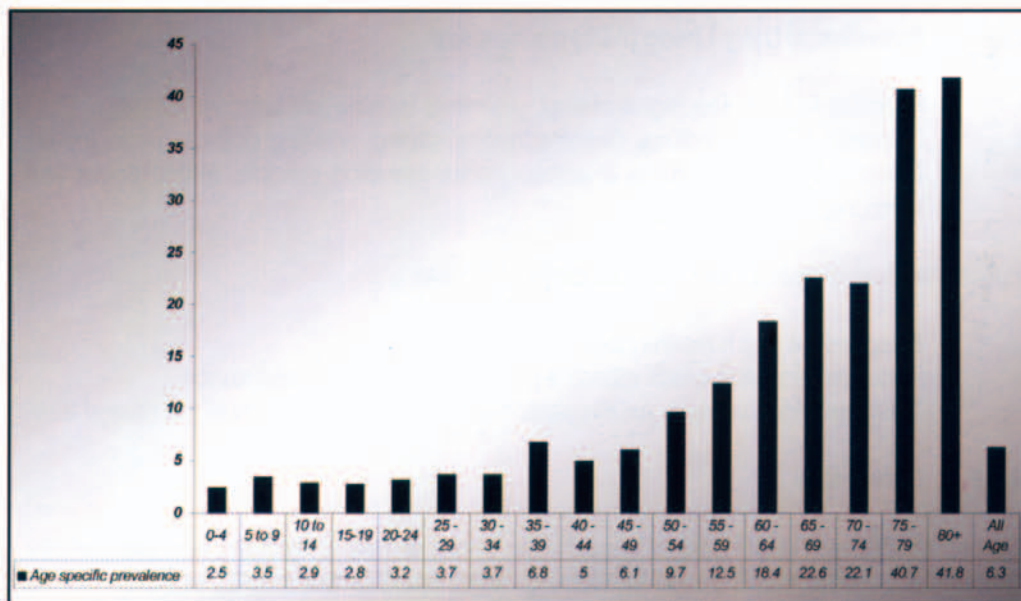


Figure 5.1: Age-specific prevalence of physical disability (per 1000 population)

The prevalence was higher among males compared to females and it was statistically significant with p value of 0.002 (Figure 5.2). However there was no significant difference in terms of rural / urban distribution and ethnic group (Appendix 1: Table 1).

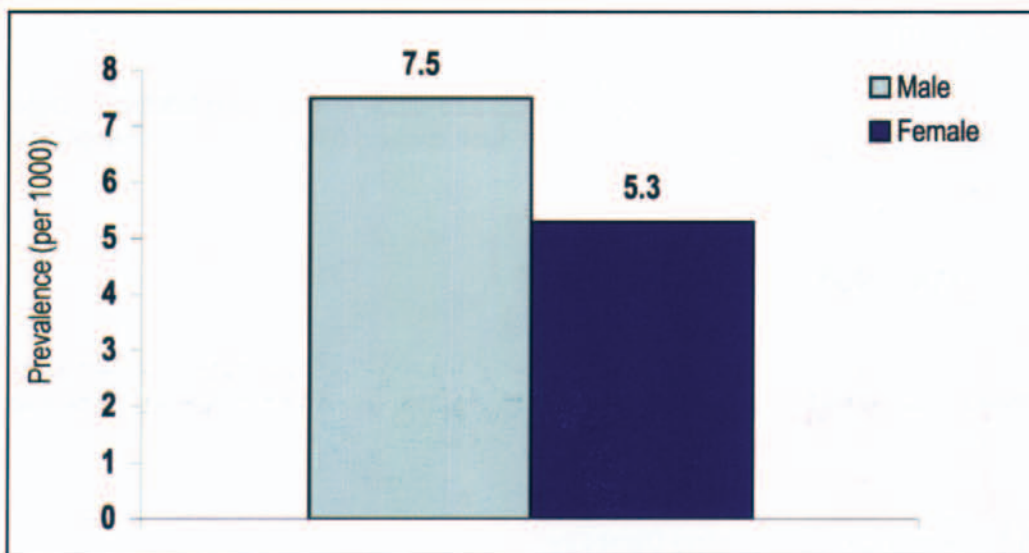


Figure 5.2: Prevalence of physical disability by gender (per 1000 population)

States with the highest prevalence of physical disability in descending order were Negeri Sembilan, Malacca, Pahang, Kedah and Kuala Lumpur Federal Territory (Figure 5.3).

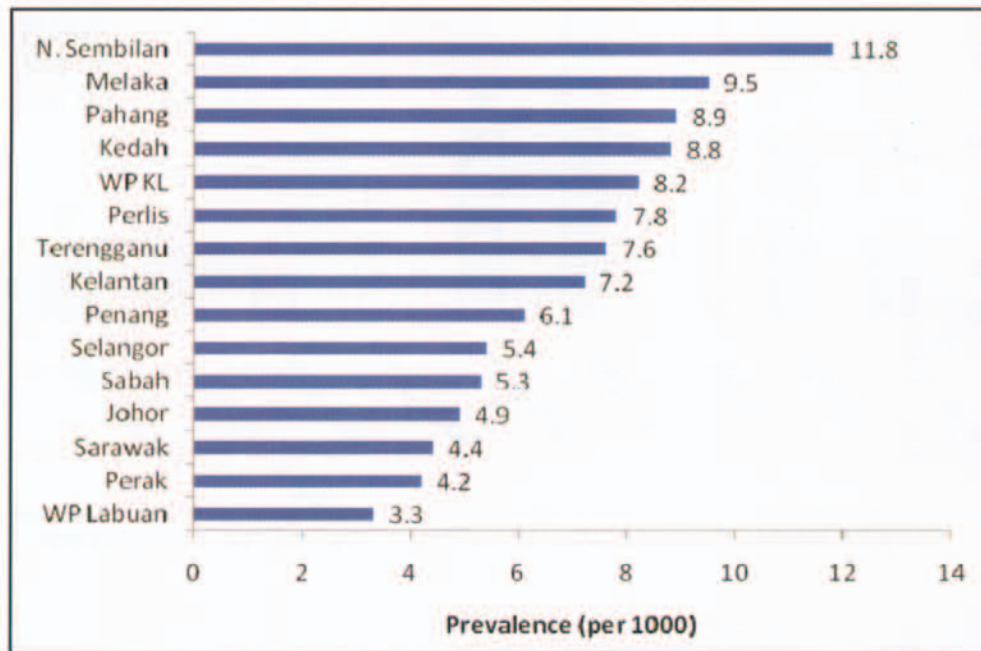


Figure 5.3: Prevalence of physical disability by state

The monthly household income for individuals with physical disability was generally low with 31.9% living in families earning below RM 700 compared to the overall sample population which was 26.5% (Figure 5.4). RM 700 approximates the national poverty line (Figure 5.5).

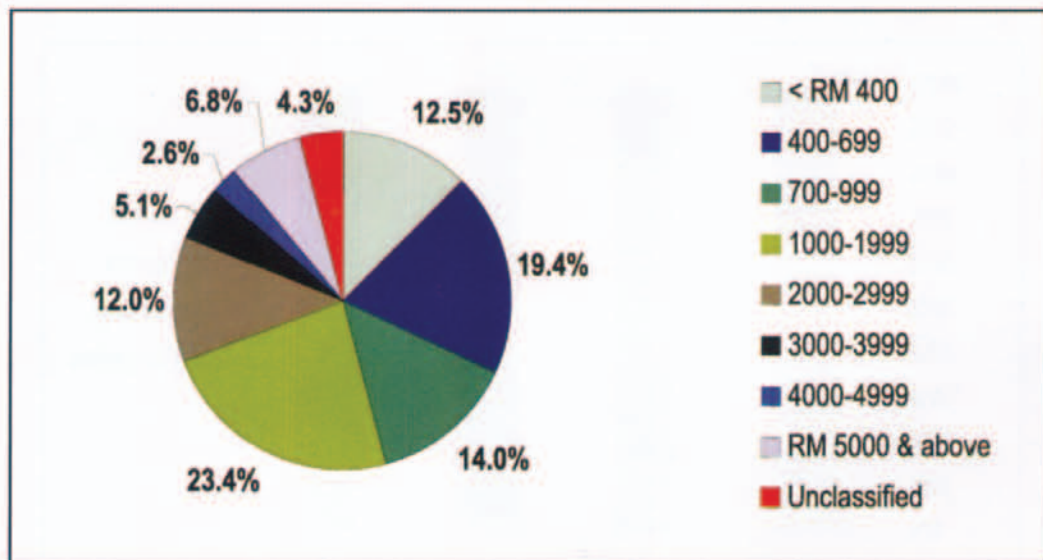


Figure 5.4: Proportion of individuals with physical disability by monthly household income

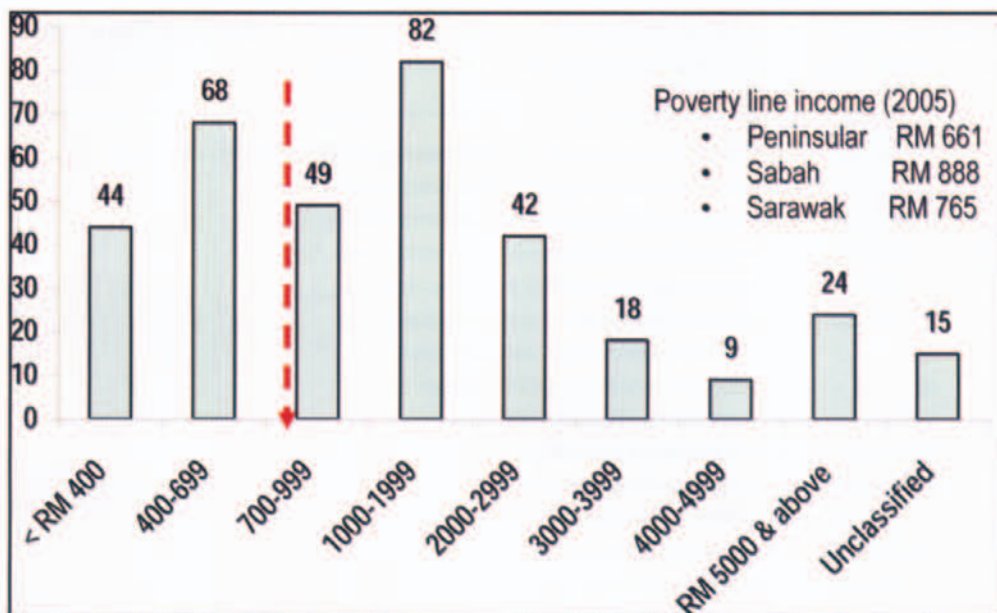


Figure 5.5: Number of individual with physical disability by monthly household income

5.2 Causes and Types of Physical Disability

In this survey, respondents were asked whether the cause of disability was congenital, or caused by illness or injury. When the cause of the disability was unknown or due to a combination of causes it was classified as 'others'. Figure 5.6 shows the causes of physical disability as reported by respondents. Majority were due to acquired causes however in children with physical disability the commonest cause was congenital.

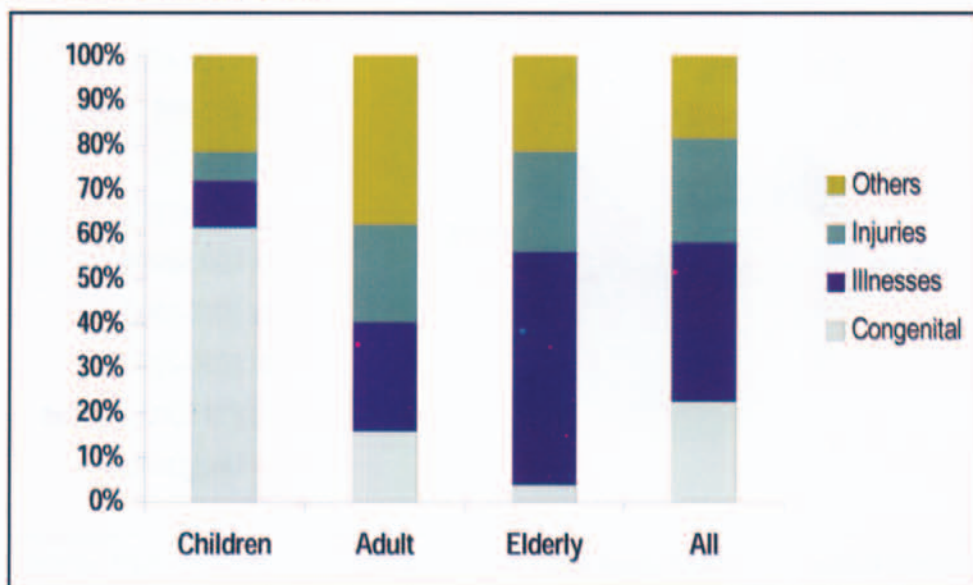


Figure 5.6: Causes of physical disability by age categories (self-reported)

In this survey, physical impairment refers to problems in body function or structure involving the head, face and neck, upper and/or lower limbs. This was further reclassified into seven categories as shown in Figure 5.7. The commonest category of physical impairment involved only the head, face and neck area.

5.3 Physical Disability among Children Aged 7 - < 18 Years

In this survey 37 children aged between 7- <18 years were reported to have PD giving a prevalence of 2.8 per 1,000 population.

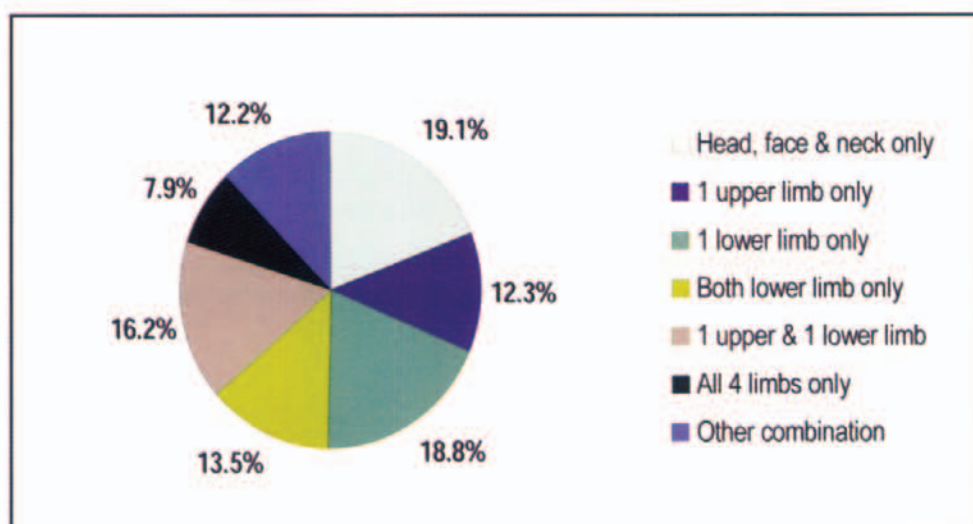


Figure 5.7: Types of physical disability

5.3.1 Impact on functional independence in ADL and mobility

With regards to the impact of physical disability on the functional independence among children, majority of them were independent with slightly more than a third being partially dependent in areas of self care such as eating, bathing, dressing and use of toilet (Figure 5.8).

The more severe the disability (e.g. those with all four limbs involvement), the more dependent the child was on others for his or her self care and mobility. For example, 6 out of 9 children (67%) with PD who were totally dependent for their mobility had four limbs involvement and none of those with one limb involvement (either upper or lower limb) was totally dependent for the above activities (Appendix 1: Table 2).

Nine out of 13 (68%) school going children with physical disability who needed help for their mobility were reported to be carried around by their caregivers with only one (6.5%) of them used wheelchair.

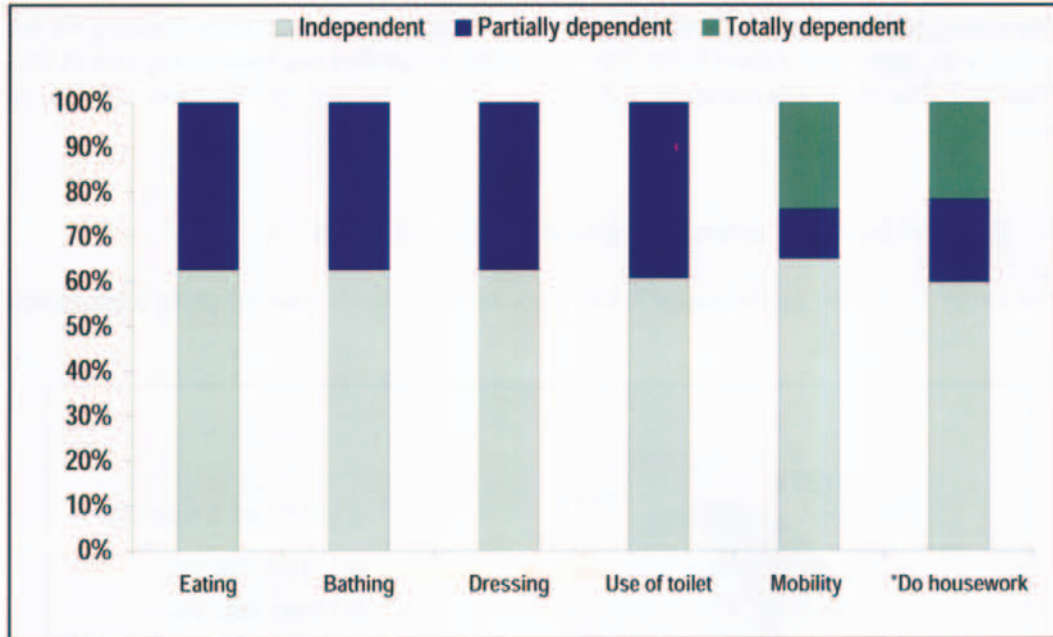


Figure 5.8: Impact of physical disability on functional independence in children aged 7 – <18 years old

5.3.2 Impact on communication

Only 60.6% of children with PD were reported to have verbal communication, 25.5% communicated by using gestures and 13.9% did not communicate at all (Figure 5.9). Though the number was small, it is important to note that none of these children used any communication aids.

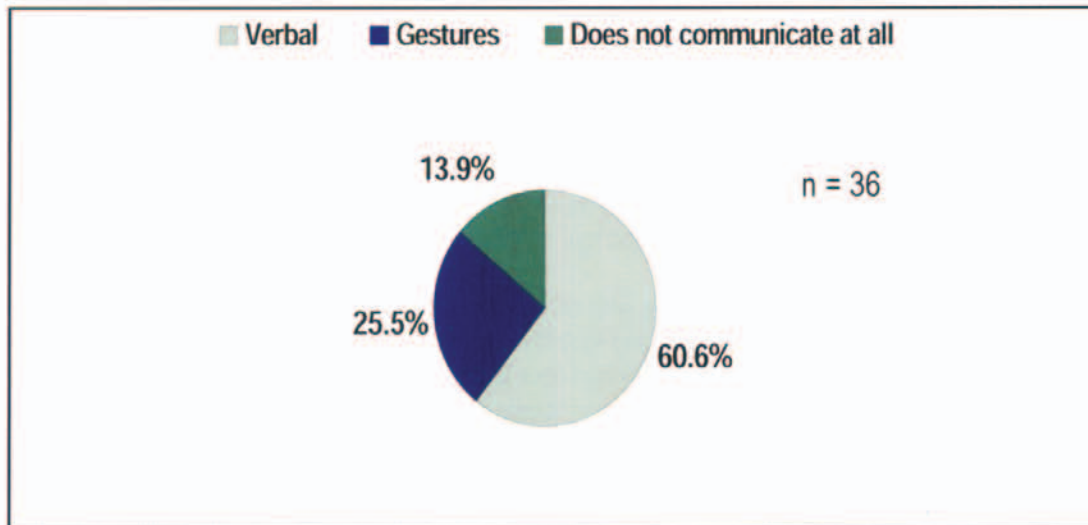


Figure 5.9: Mode of communication in children with physical disability aged 7 – <18 years

5.3.3 Impact on education

Almost a third (31.5%) of the children with PD did not receive formal education as compared to 1.7% of children without PD (Figure 5.10) and this was statistically significant with a *p* value of less than 0.001. On further analysis, the impact of PD on a child's education was most evident among those having two lower limbs (26.0%) and all four limbs involvement (66.4%) (Figure 5.11)

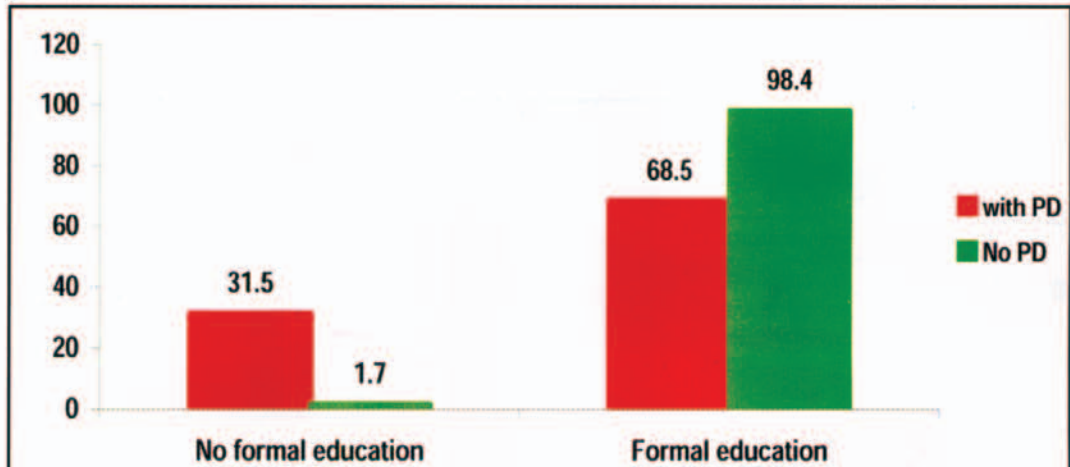


Figure 5.10: Proportion of children aged 7 - <18 years old with and without physical disability attending formal education

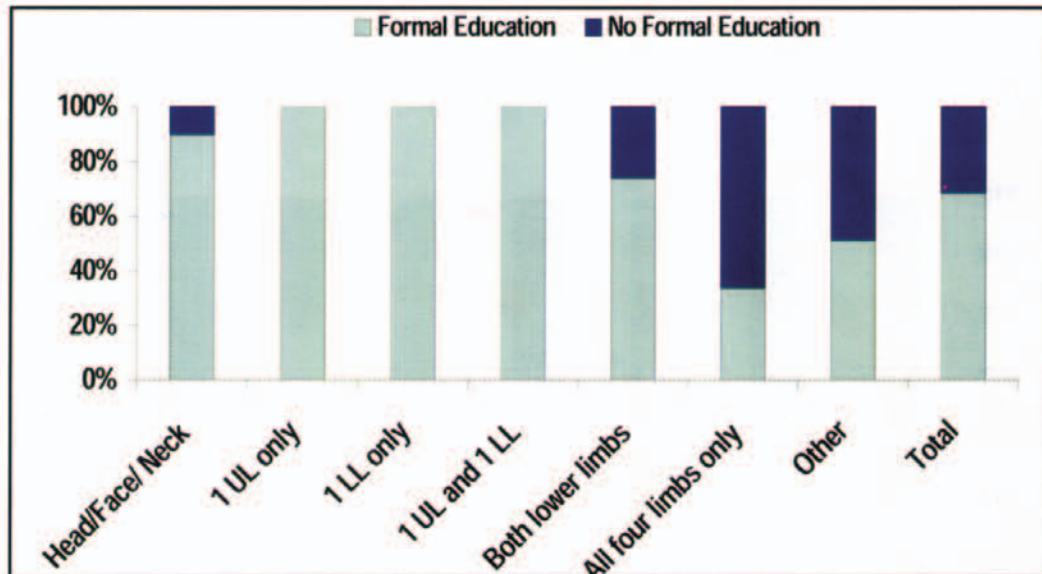


Figure 5.11: Proportion of children (aged 7 - <18 years old) with physical disability attending formal education - by types of PD

5.3.4 Impact on access to public places

The children with PD were more housebound compared to those without PD. However this was not statistically significant ($p = 0.072$). Children with PD were twice less likely to be taken to public places (Figure 5.12). When probed further, 38.4% of parents /caregivers said there was 'no need' and 34.4% mentioned 'no transport' as reasons for not taking the child to public places. It was also noted that those with both lower limbs and all four limbs involvement were less likely to be taken to public places (Figure 5.13).

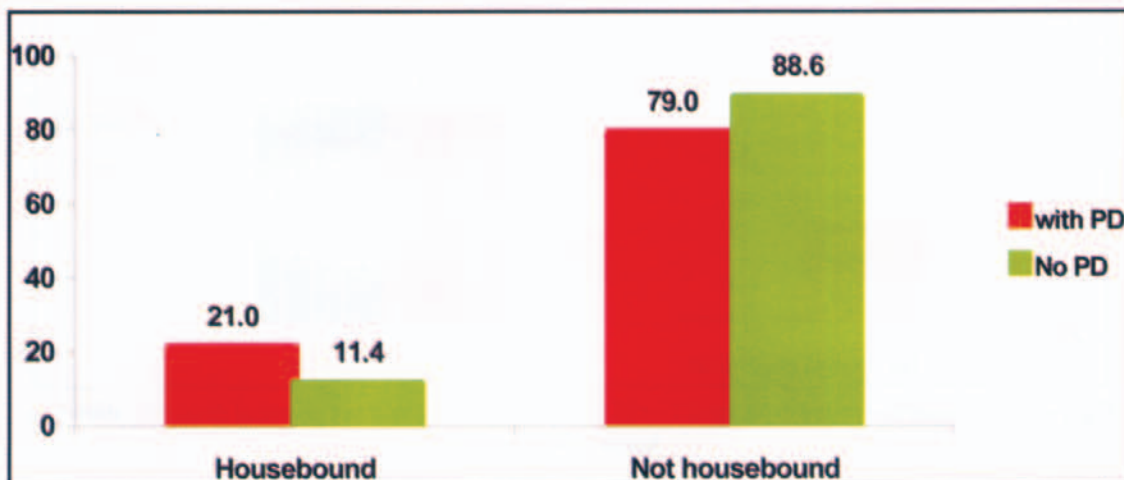


Figure 5.12: Proportion of children (aged 7 - <18 years old) with and without PD with regards to their access to public places (housebound vs not housebound)

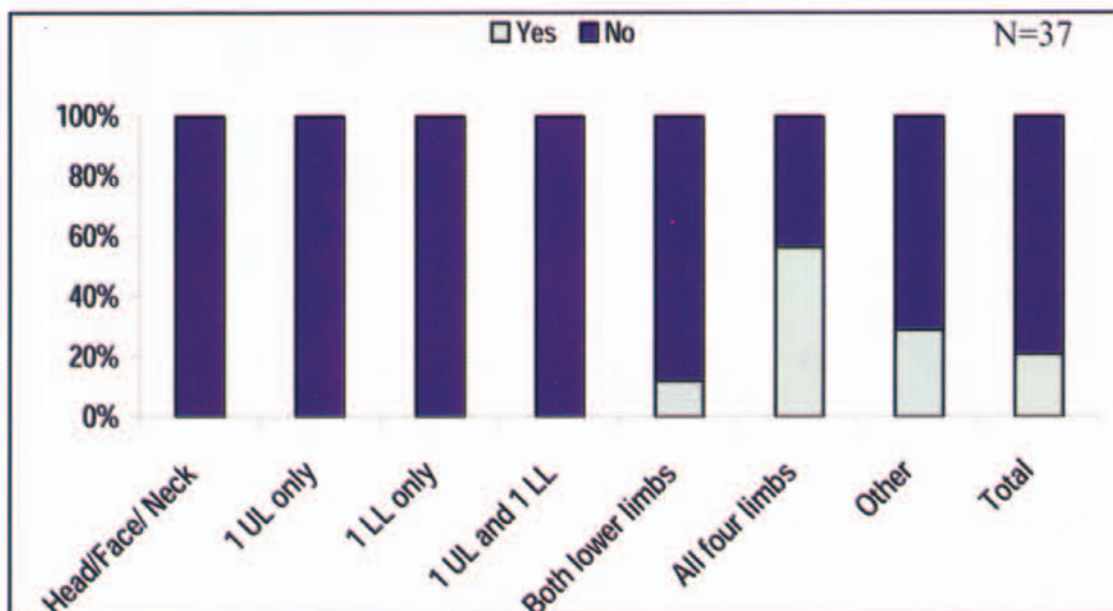


Figure 5.13: Proportions of children (aged 7 - <18 years old) with physical disability who are house-bound by types of PD

5.3.5 Safety issues

Only 2 out of 36 (5.5%) of children with physical disability were reported to have experienced injury at home, 2 out of 35 (6%) experienced injury on the road and none at recreational areas or at school. These findings were comparable to those without physical disability (Appendix 1: Table 3).

5.4 Physical Disability among Adults Aged 18 - <60 Years

A total of 171 adults with physical disabilities were interviewed. The prevalence was 5.9 per 1,000 populations. It increased with age especially after 50 years old. There were also more males (7.8 per 1,000) than females (4.3 per 1,000) with physical disabilities in this age group. Out of this number, the physical disabilities were due to congenital causes (21.7%), illnesses (33.0%), injuries (29.9%) and others (51.4%). The distribution of types of disabilities are as follows: head, face and neck only (23.4%), one upper limb only (16.4%), one lower limb only (19.9%), both lower limbs only (7.6%), one upper and one lower limb only (13.4%), all four limbs (5.8%) and other combinations (13.5%).

5.4.1 Socio-demographic characteristics

a) Education Level

The proportion of highest education level attained for adults with disabilities were as follows: tertiary (9.0%), secondary (43.7%) and primary (32.7%). Thirteen percents of adults with disability had never attended school. This was highest among those with both lower and all four limbs involvements as shown in Figure 5.14. The comparison of highest education level between adults with and without physical disability is shown in Figure 5.15 and Appendix 1: Table 4.

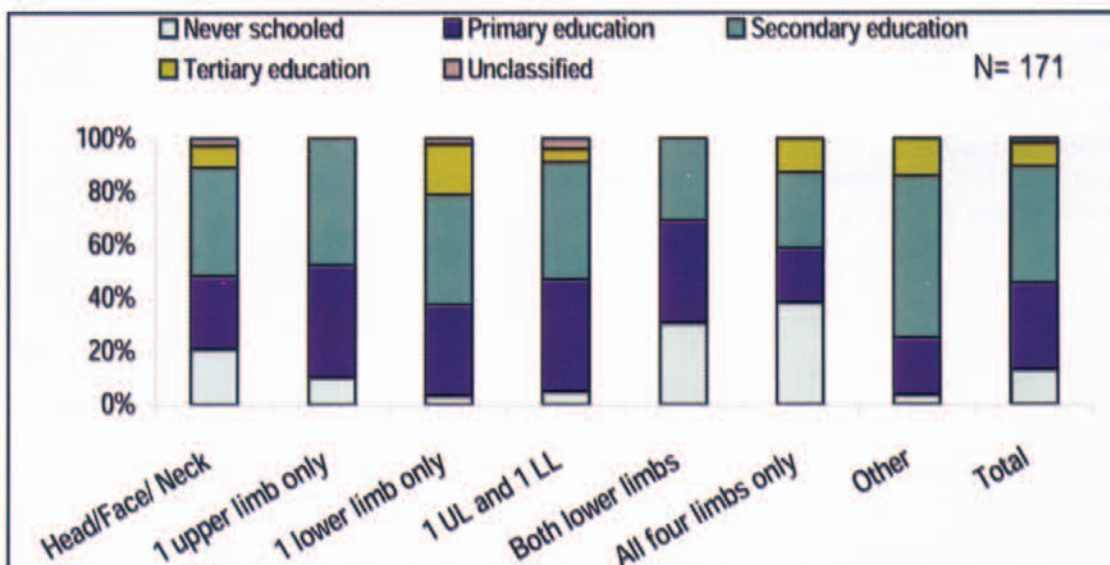


Figure 5.14: Highest education level of adults (18 - <60 years old) with physical disability by types of PD

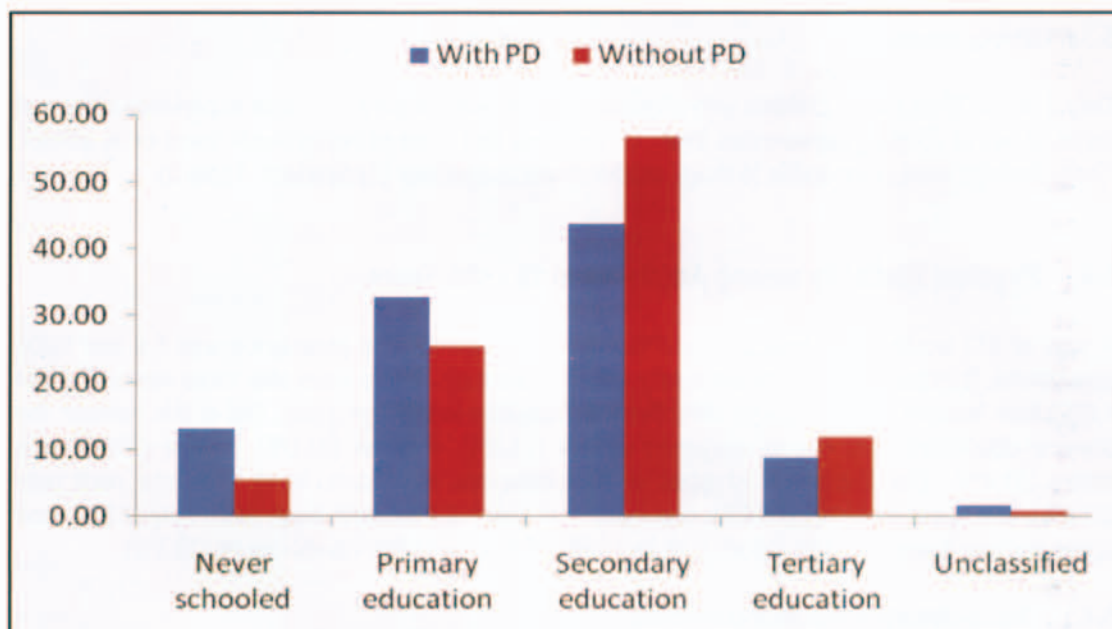


Figure 5.15: Highest education level of adult (18 - <60 years old) with and without physical disability

b) Employment status

The survey found that 40.5% of adults with physical disabilities were unemployed, only 31.6% held paid jobs, and 17.5% were self-employed as shown in Figure 5.16. The employment status by types of physical disability is shown in Figure 5.17. Unemployment was more common in those with more than one limb involvement. None of the adults with disabilities involving all four limbs held a paid job, however 42% of them were self employed. The percentage of those who held a paid job is highest (i.e. 43.7%) among those adults with disabilities involving only the head, face or neck. The employment status (paid job or unemployed) of adults with and without physical disabilities were also compared and it was found that there was a significant difference with a *p* value of less than 0.001 (Figure 5.18 and Appendix 1: Table 5).

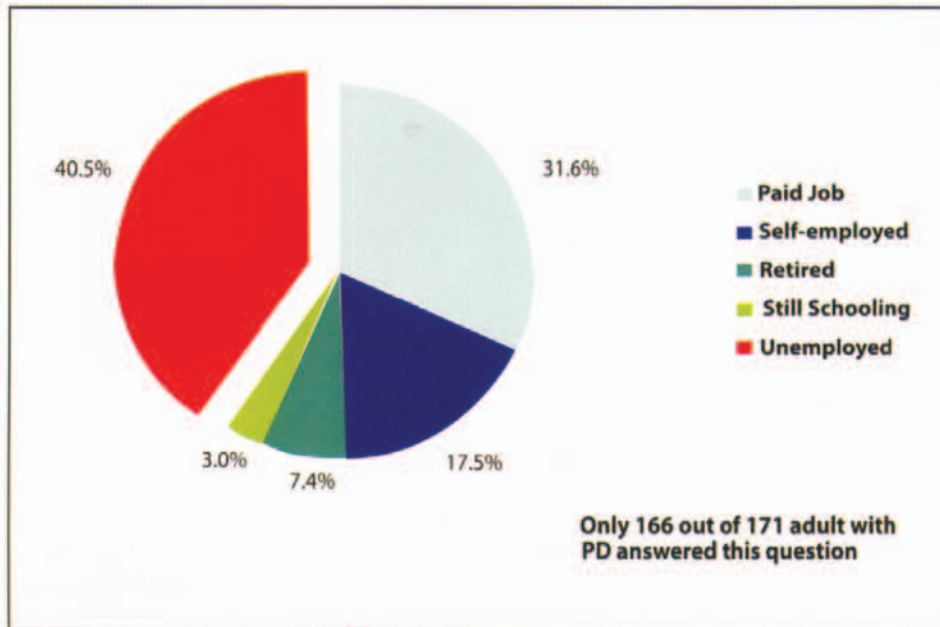


Figure 5.16: Current employment status of adults (18 - < 60 years old) with physical disability (all types of PD)



Figure 5.17: Current employment status of adults (18 - < 60 years old) with physical disability by types of PD

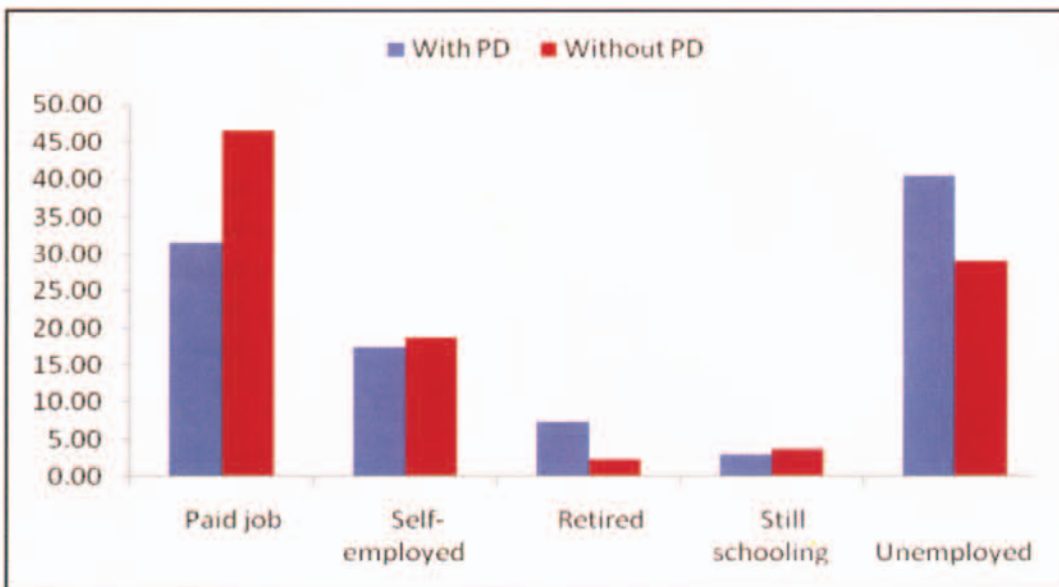


Figure 5.18: Current employment status of adults (18 - < 60 Years Old) with and without physical disability

c) Personal monthly income

Majority (57.6%) of the adults with physical disabilities earned less than RM 1000 with 19.1% earning less than RM 400 as shown in Figure 5.19. Types of disabilities in adults did not seem to influence personal monthly income as shown in Figure 5.20. The findings showed that 51.1% in the all 4 limbs involvement category earned between RM 3000 – 3999. The comparison of the income status among adults with physical disabilities and those without and found there was no significant difference in their income level ($p=0.087$).

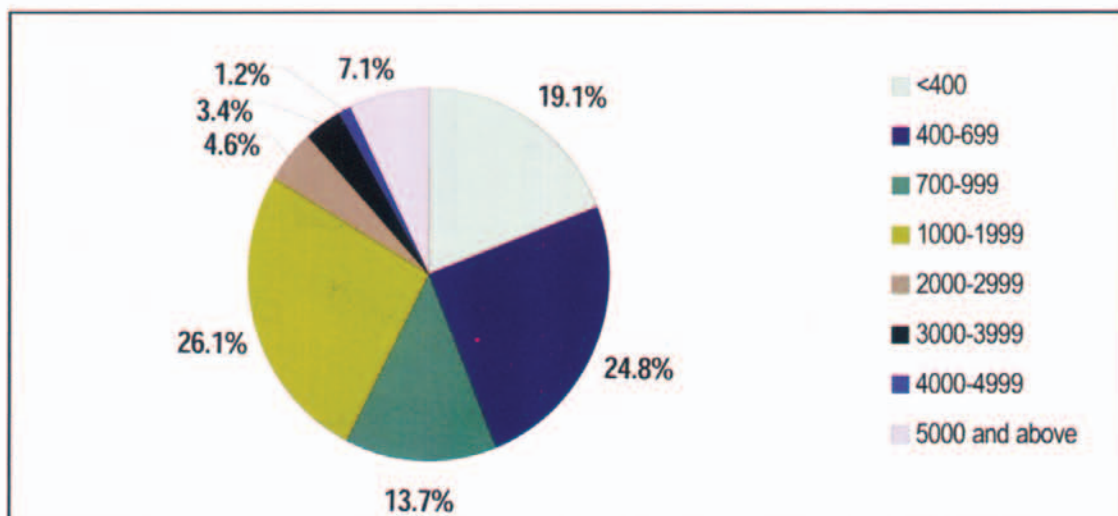


Figure 5.19: Personal monthly income of adults (18 - < 60 years old) with physical disability (all types of PD)

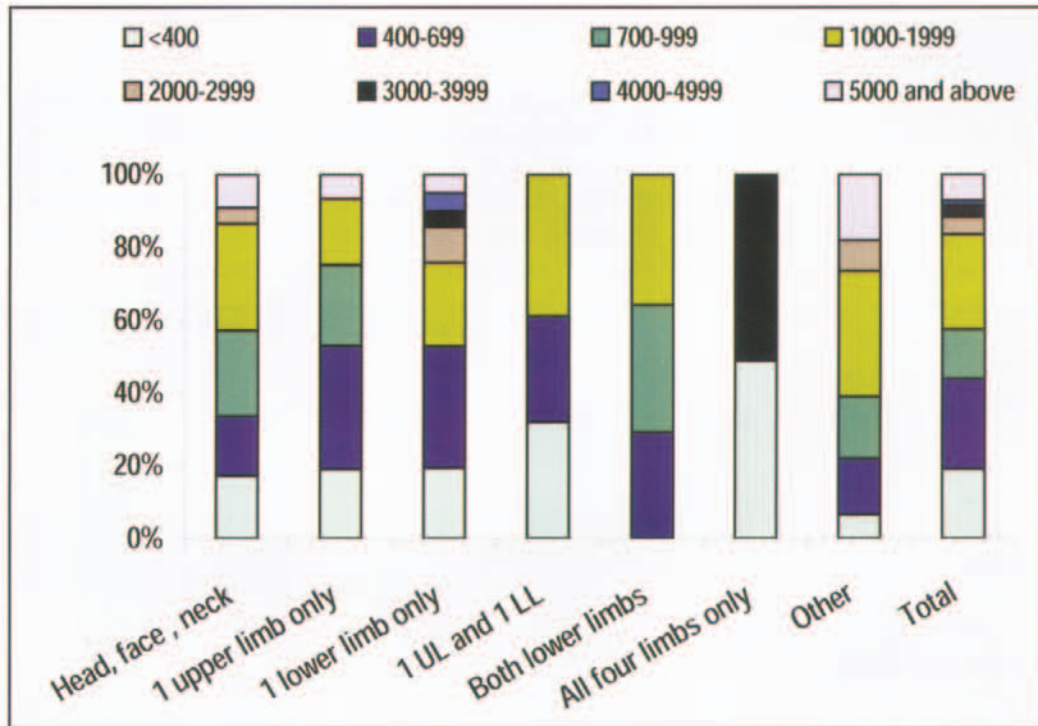


Figure 5.20: Personal monthly income of adults (18 - < 60 years old) with physical disability (by types of PD)

d) Marital Status

Approximately quarters (26.8%) of the adults with physical disabilities were not married and 4.3% were divorced at the time of interview as shown in Figure 5.21.

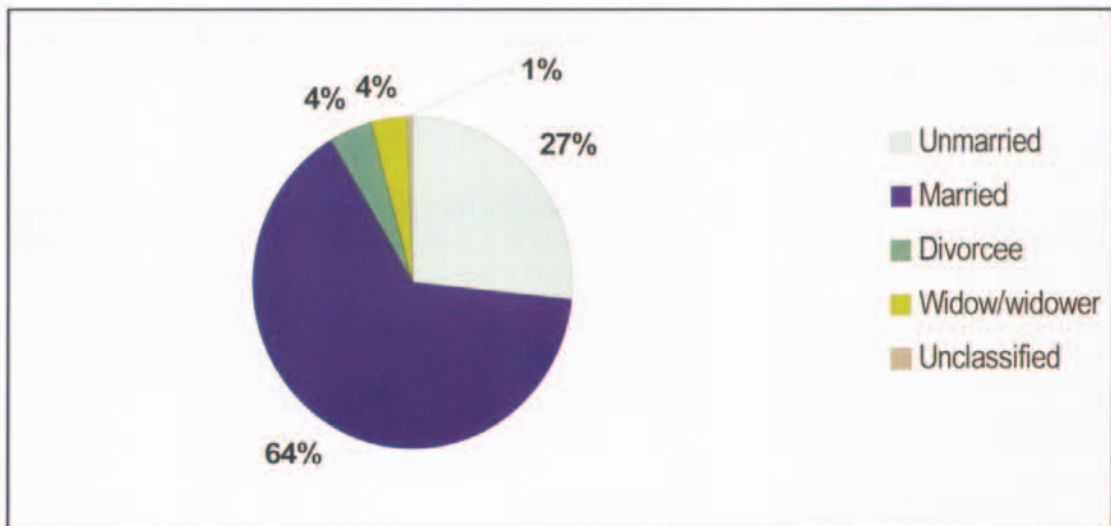


Figure 5.21: Marital status of adult (18 - < 60 years old) with PD

5.4.2 Impact on functional independence in ADL and mobility

Between 9 to 31 % of adults with Physical Disability were partially or totally dependent for their core functional activities i.e. self care (eating, bathing, dressing, use of toilet), mobility and domestic activities as shown in Figure 5.22 below. They had increasing difficulty in performing functional activities in the following order: eating, bathing, dressing, use of toilet, mobility and doing housework. However, there were a large number of missing data whereby only 109 respondents answered the question on self care, 106 answered the question on mobility and 107 on housework.

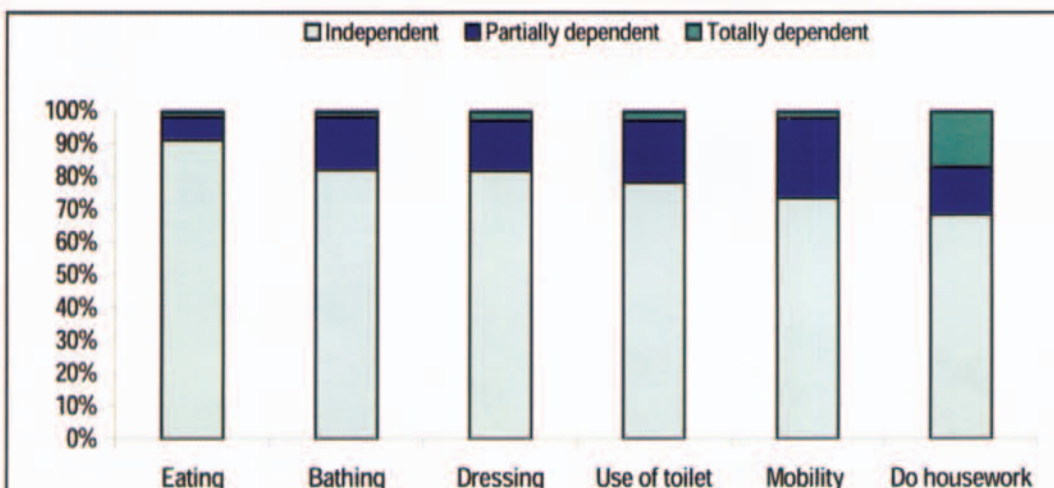


Figure 5.22: Impact of physical disability on functional independence on adults (aged 18 to <60 years old)

5.4.3 Impact on communication

Communication did not appear to be a problem in the physically disabled adults as compared to the children group. 95.4% were able to communicate verbally, 3.5% communicated using gestures and only 1.1% was unable to communicate at all.

5.4.4 Impact on access to public places

It was found that 26% of adults with physical disabilities were housebound. Figure 5.23 shows the proportions of those housebound by type of disability and found that it was highest in the group with both lower limb involvement (75.3%). Interestingly, in the group with all four limb involvement, only 17.8% were housebound in the month preceding the interview.

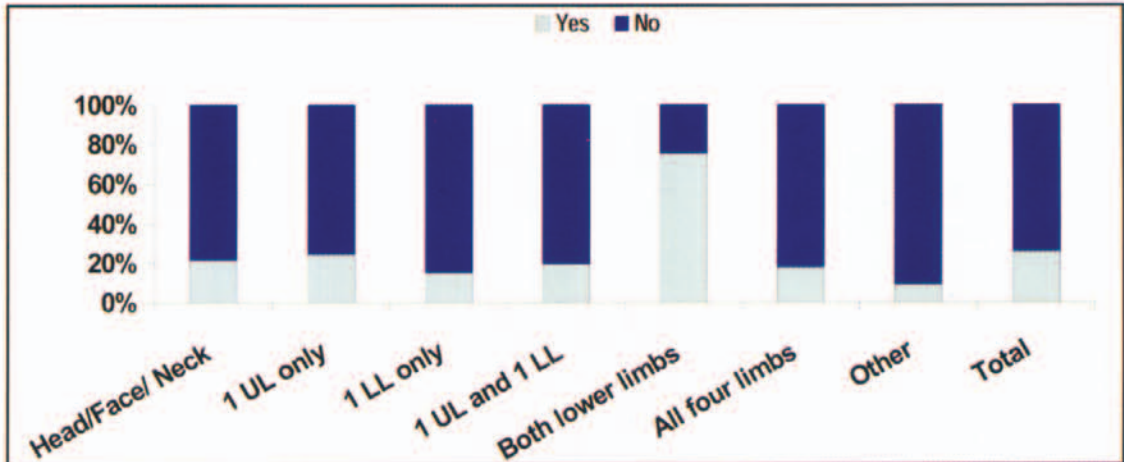


Figure 5.23: Proportions of adults with physical disability (Aged 18 - < 60 Years Old) who were house-bound (by types of PD)

5.4.5 Internet access

In terms of access to internet, only 10.9% of adults with physical disabilities surfed the internet within the past 3 months compared to 19.99% of adults without PD with a p value of less than 0.001 (Figure 5.24). Figure 5.25 shows the proportions of those who surfed the internet according to type of physical disability. Only 3.75% in the group with one upper limb involvement and none in the group with one upper limb and one lower limb involvement surfed the internet. However, 12.78% in the all four limbs group had internet access during that period.

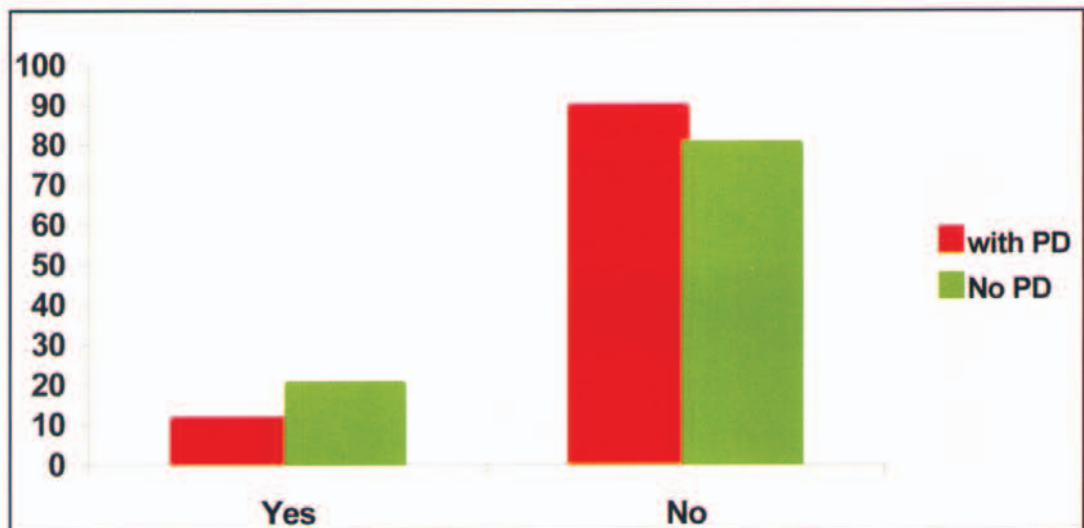


Figure 5.24: Proportions of adults with and without physical disability who have internet access in the past 3 months (aged 18 - < 60 years old)

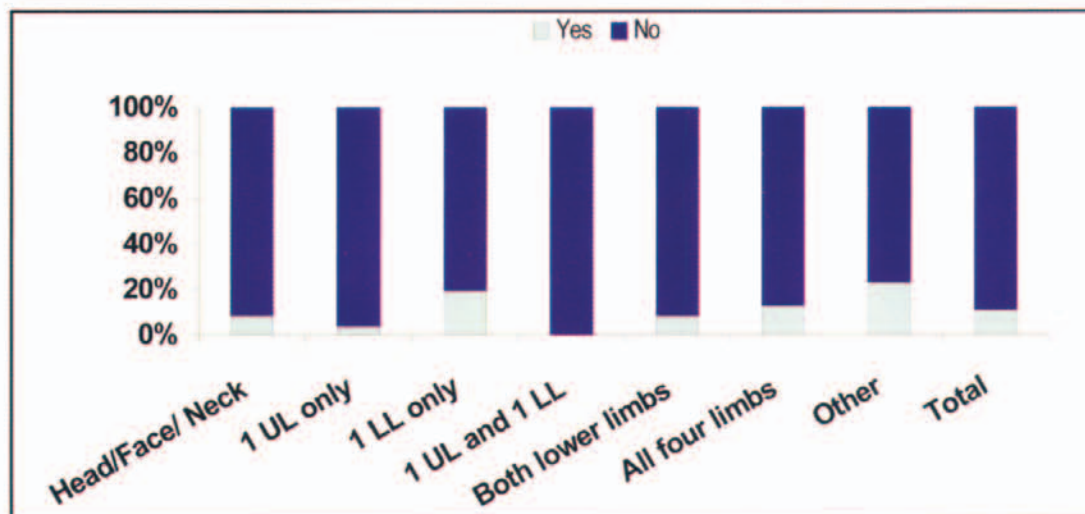


Figure 5.25: Proportions of adults with physical disability who surfed the internet by type of disability (aged 18 - < 60 years old)

5.4.6 Safety issues

Adults with physical disability were more prone to injuries at home, on the road, and at work place compared to adults without PD as show in Figure 5.26. However it was statistically significant only for injuries sustained at workplace with a p value of < 0.05. Home injury was highest among adults with physical disability who have one upper and one lower limb involvement (17.6%) and both lower limbs involvement (15.2%). Injury at workplace only involved adults with physical disability who had only one upper limb involvement (9.5%), one lower limb (16.5%), and head/face/neck (13.9%) involvement.

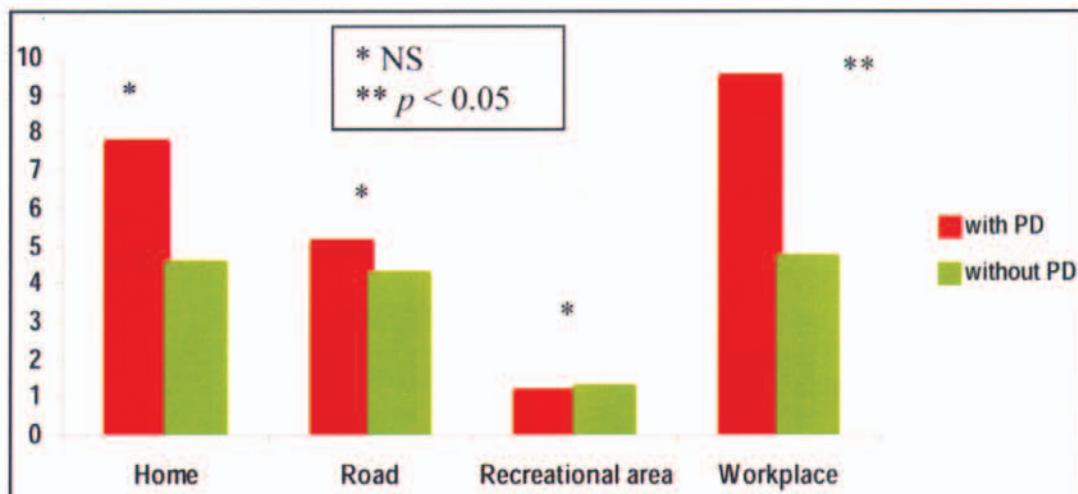


Figure 5.26: Proportions of adults with and without physical disability who had injury in the past 1 year (aged 18 - < 60 years old)

5.5 Physical Disability among Older Persons Aged 60 Years and Above

Physical disability was seen to be higher among the older segment of the population. The total number of older persons with physical disability in this survey was 118, giving a prevalence of 24.2 per 1000 population. Older persons were sub-categorized into two main groups, i.e. 60 - 74 years old and 75 years and above.

5.5.1 Impact on functional independence in ADL and mobility

In general, older persons with physical disabilities need more help in all domains of ADL compared to those without physical disabilities. However their dependency in personal ADL was mostly partial as shown in Figures 5.27 until 5.30. Eating was the activity where they needed least help.

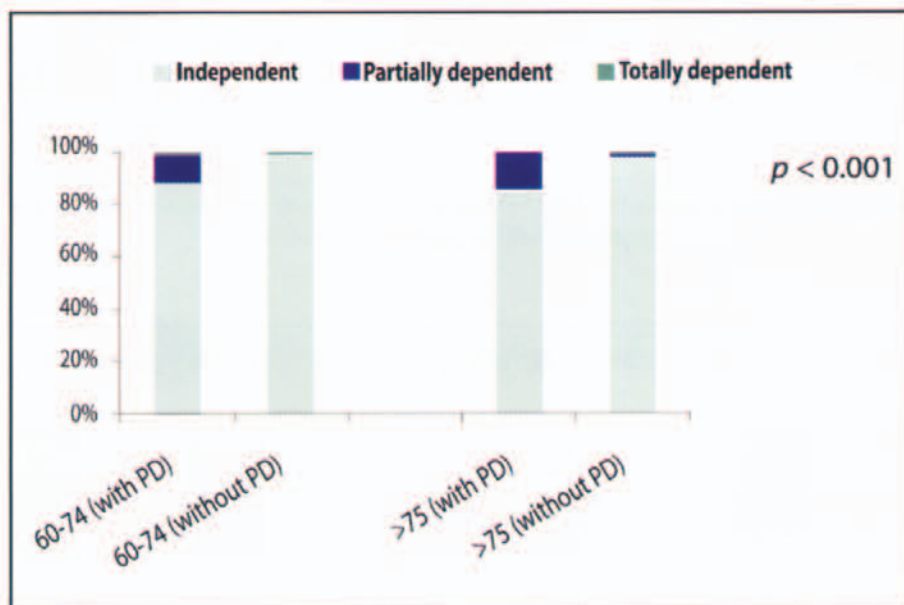


Figure 5.27: Functional independence in self-care (eating) among older persons with and without physical disability (aged 60 and above)

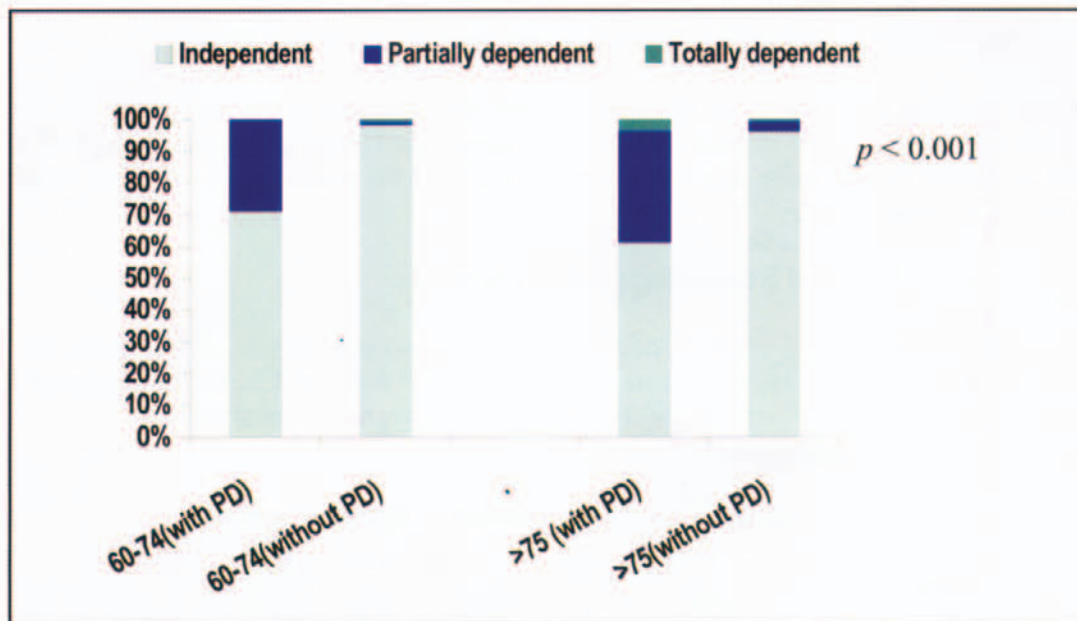


Figure 5.28: Functional independence in self-care (bathing) among older persons with and without physical disability (aged 60 and above)

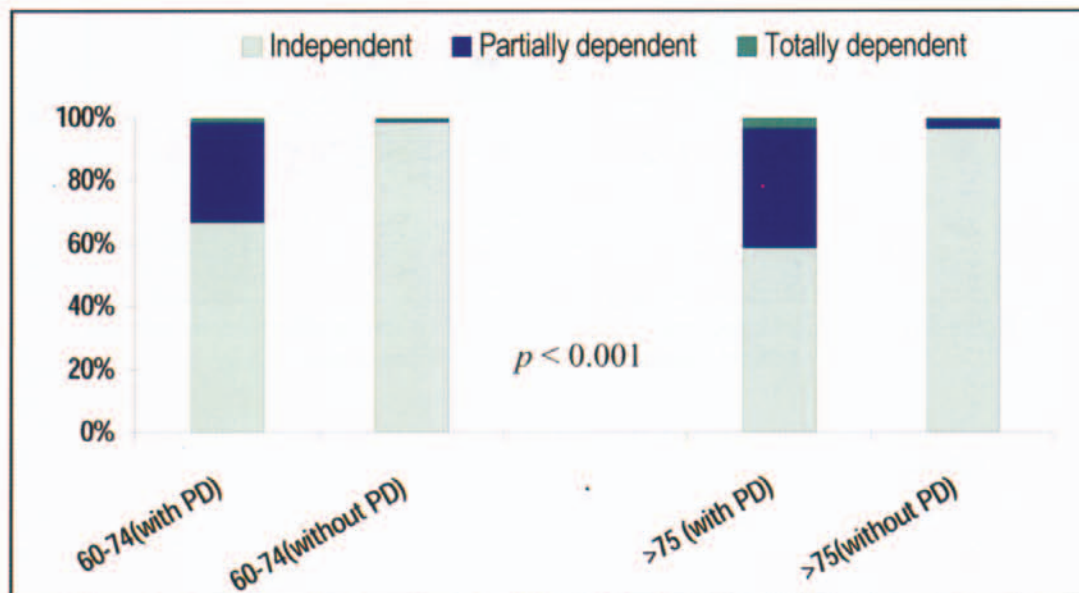


Figure 5.29: Functional independence in self-care (dressing) among older persons with and without physical disability (aged 60 and above)

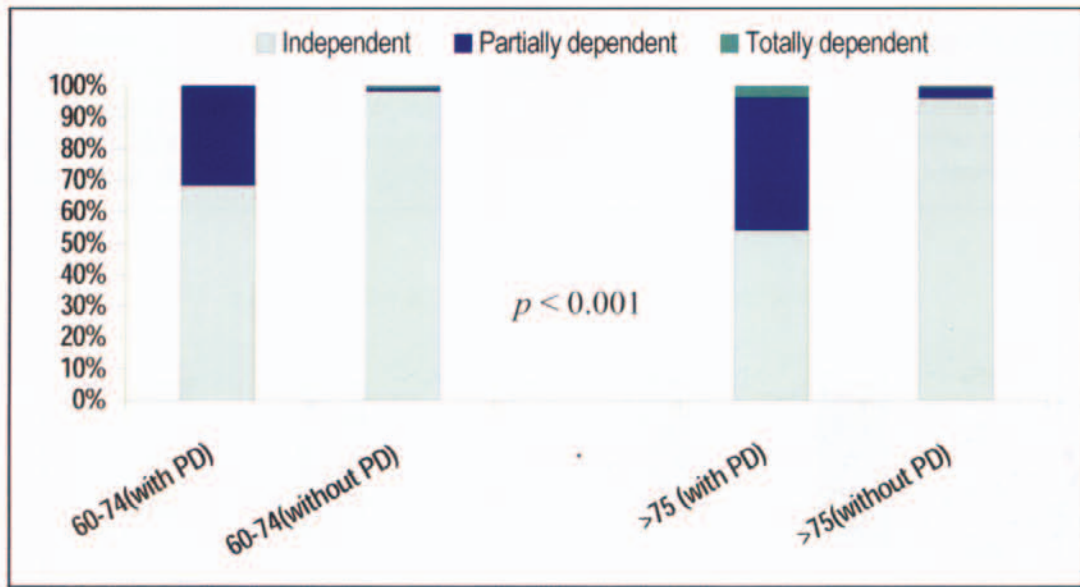


Figure 5.30: Functional independence in self-care (use of toilet) among older persons with and without physical disability (aged 60 and above)

Almost half (44.8%) of older persons with PD were totally dependent and another 19.2% were partially dependent for their domestic ADL. This was especially so for those who were 75 years old and above. When compared to older persons without PD, the above findings were statistically significant with p value of less than 0.001 (Figure 5.31).

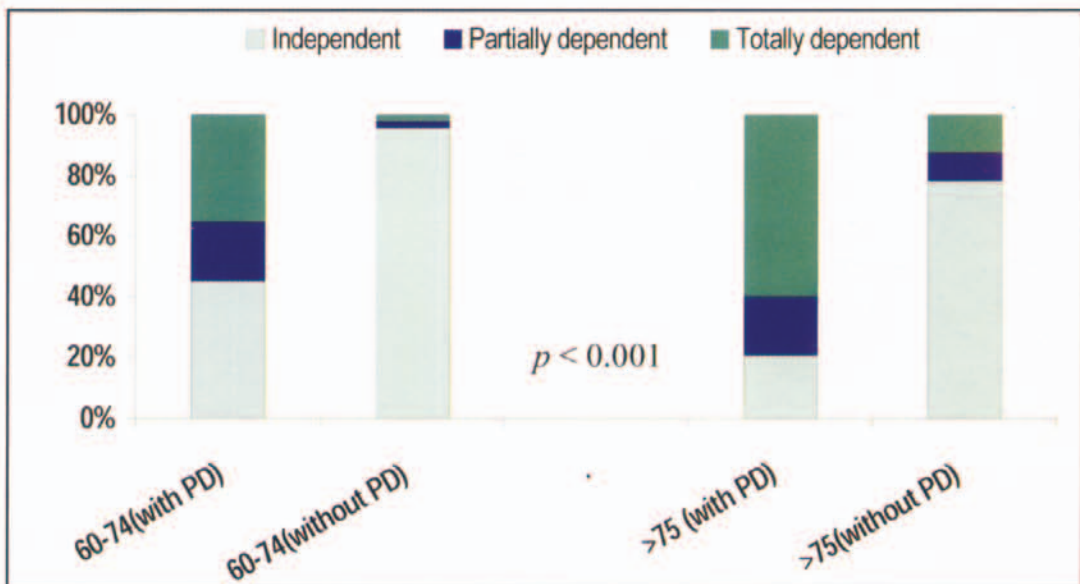


Figure 5.31: Functional independence in domestic ADL (doing housework) among older persons with and without physical disability (aged 60 and above)

Majority of older persons with PD (62.9%) needed help for their mobility (Figure 5.32). Among those who needed help, 43% used walking aids, 22% needed wheelchairs and 20% walked holding onto caregivers or furniture (Figure 5.33). The proportion of older persons with PD requiring wheelchair and those who were bed-bound were higher compared to those without physical disability 21.7% and 10.5% versus 14.4% and 2.1% respectively. However these findings were not statistically significant.

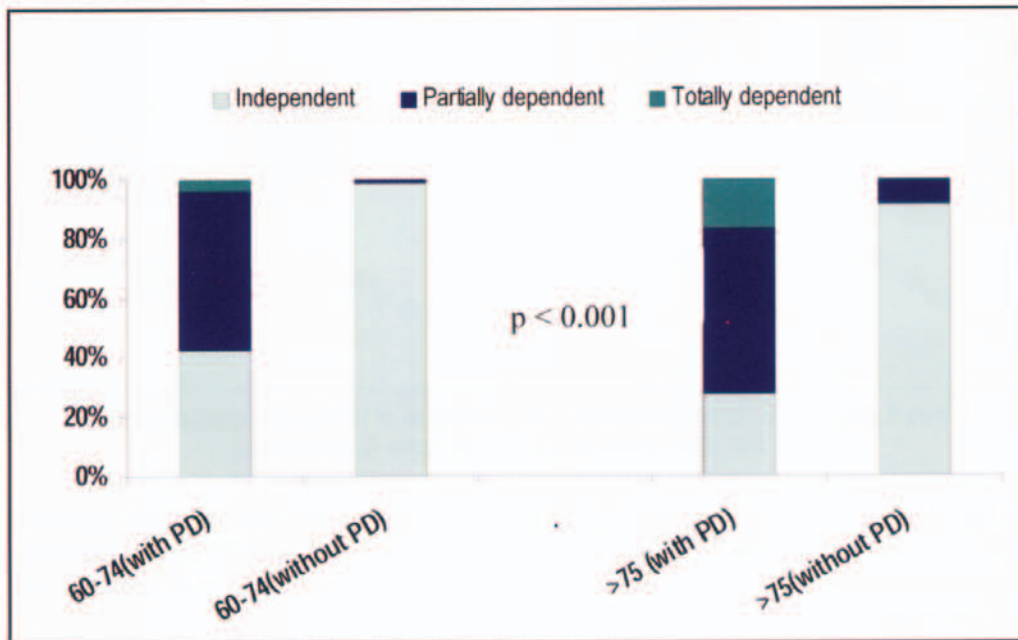


Figure 5.32: Functional independence in mobility among older persons with and without physical disability (aged 60 and above)

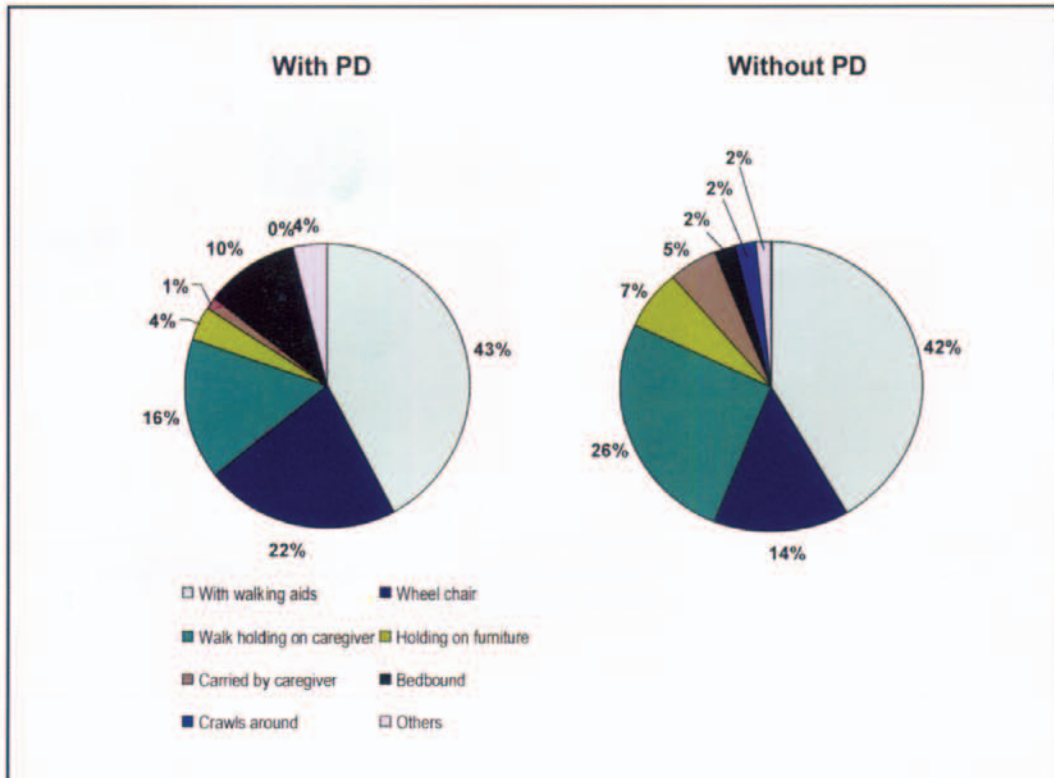


Figure 5.33: Mode of mobility of older persons with and without physical disability (aged 60 and above)

5.5.2 Impact on communication

Communication did not appear to be a problem in the older persons with PD, as 97.12% were able to communicate verbally.

5.5.3 Impact on access to public places

Fifty percent of older persons with PD were house bound compared to 19% of those without physical disability. This finding was statistically significant with a p value of less than 0.001 (Figure 5.34). Proportion of older person with PD who was house bound increased with the severity of the physical disability as shown in Figure 5.35.

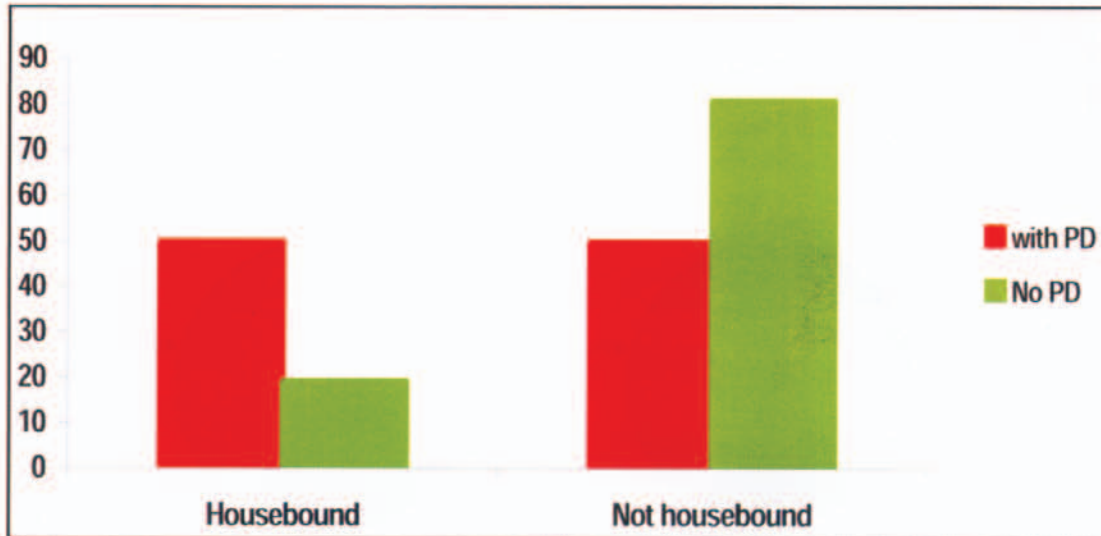


Figure 5.34: Proportions of older persons with and without physical disability who are housebound (age 60 and above)

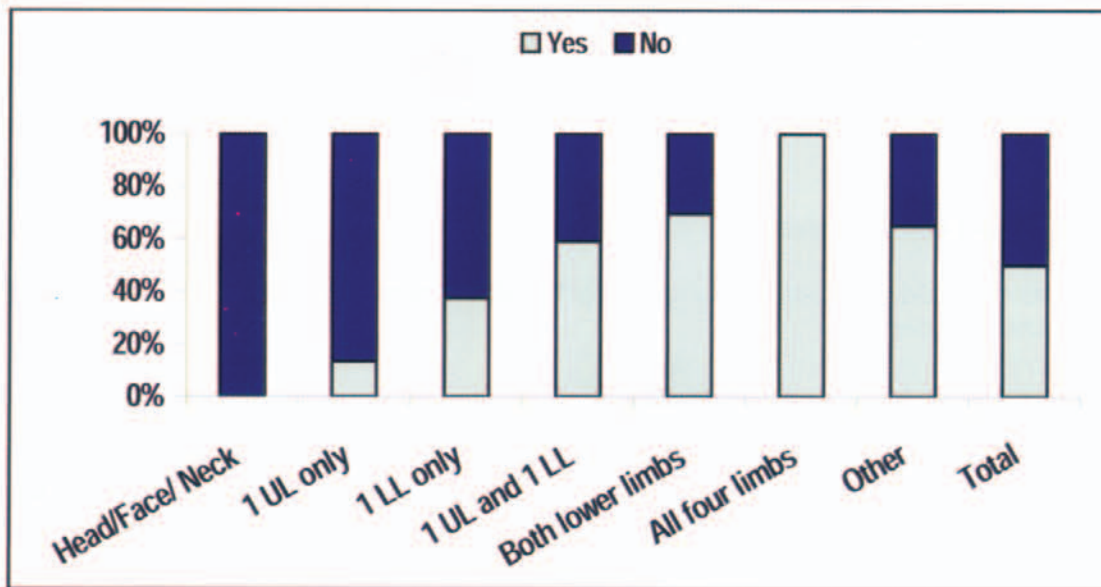


Figure 5.35: Proportions of older persons with and without physical disability who are housebound (aged 60 and above) – by types of PD

5.5.4 internet access

None of the older persons with PD reported to have surfed the internet.

5.5.5 Safety issues

Older persons with PD showed a higher proportion of having had home injury (11.9%) compared to those without physical disability (5.4%). This finding is statistically significant with p value of less than 0.001.

5.6 Registration with Department Of Social Welfare

Of the 351 individuals who reported to have a physical disability, 310 persons (88.3%) answered the question on registration with the Department of Social Welfare (DSW). Only 32% of those who answered had registered with DSW (Figure 5.36).

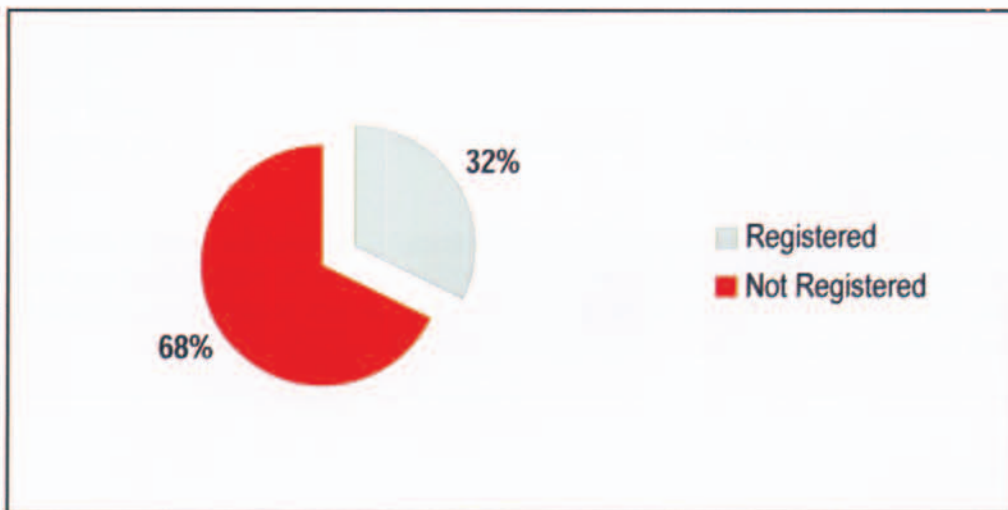


Figure 5.36: Proportion of individuals with physical disability (all ages) registered with Department of Welfare

From this survey it was found that there were differences in the proportion of those registered in terms of age group. Sixty four percent (64%) of the children below 18 years were registered, while 33.7% of the adult aged 18 to less than 60 years and only 10.9% of the older persons were registered (Figure 5.37).

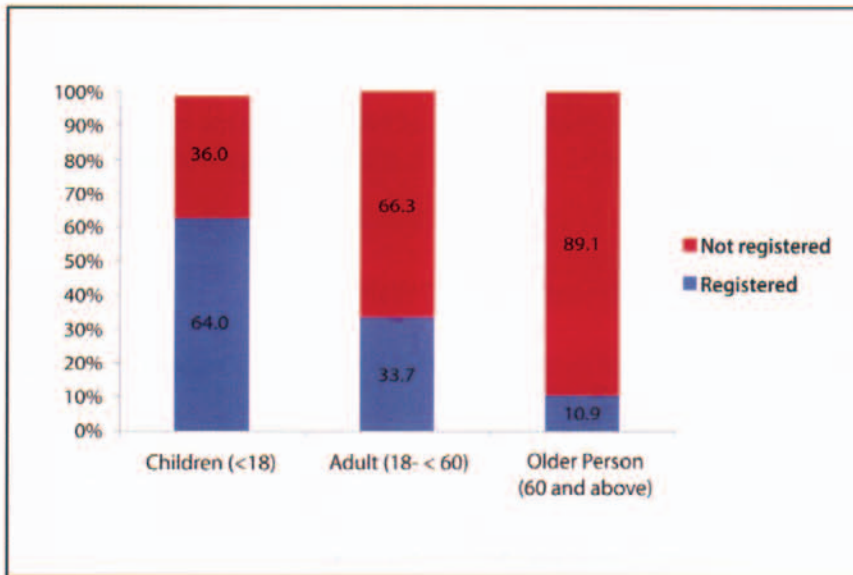


Figure 5.37: Proportion of individuals with physical disability registered with DSW (by age groups)

Only 207 out of 351 (58.7%) individuals with physical disability answered the question on the reason for not registering with DSW. Majority of the adults and older persons did not feel there was a need to register. The second most common cause for not registering was 'lack of information', followed by 'did not want to' and 'feeling embarrassed' as shown in Figure 5.38.

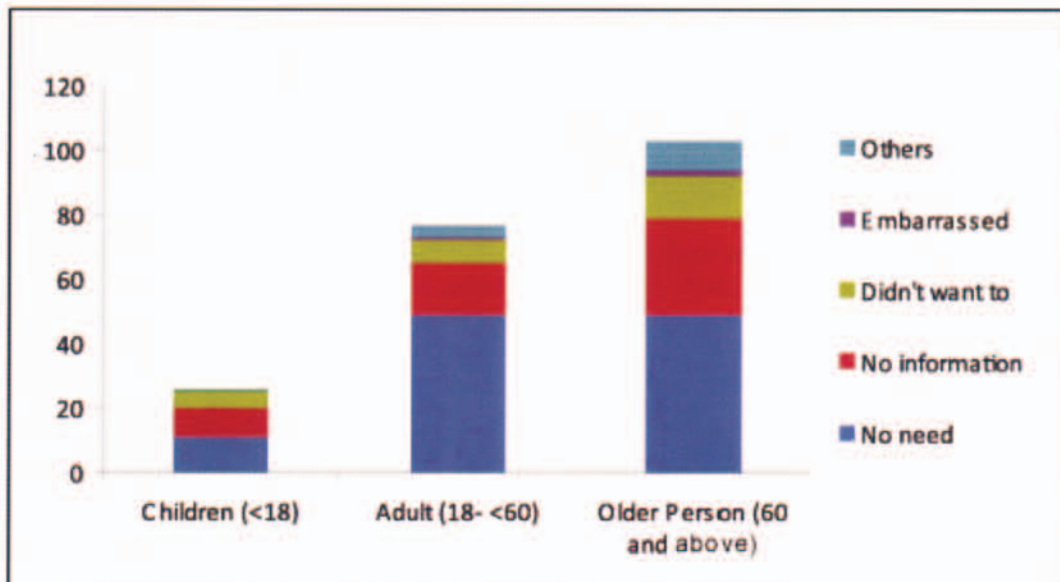


Figure 5.38: Reasons for individuals with physical disability not registering with welfare department (by age groups)

5.7 Utilization of Rehabilitation Services among Individuals with Physical Disability

86% of individuals with physical disability (302 of 351) answered the question on participation in rehabilitation programmes and 179 (59%) of these individuals had never participated in any rehabilitation programme (Figure 5.39). Among the reasons for not participating were 'not being aware of the programmes' (34%), 'no need for rehabilitation' (24%), 'no one to send' (13%), 'no time to go for rehabilitation' (8%), 'financial problems' (4.5%) and 'no transport' (1%) as shown in Figure 5.40.

Of those who participated in rehabilitation programmes, majority utilized services from hospitals (38%), health clinics (9%), community-based rehabilitation centers (9%), special education schools (11%), private rehabilitation centers (8%), centers run by non-governmental agencies (3%) and special institutions (2%).

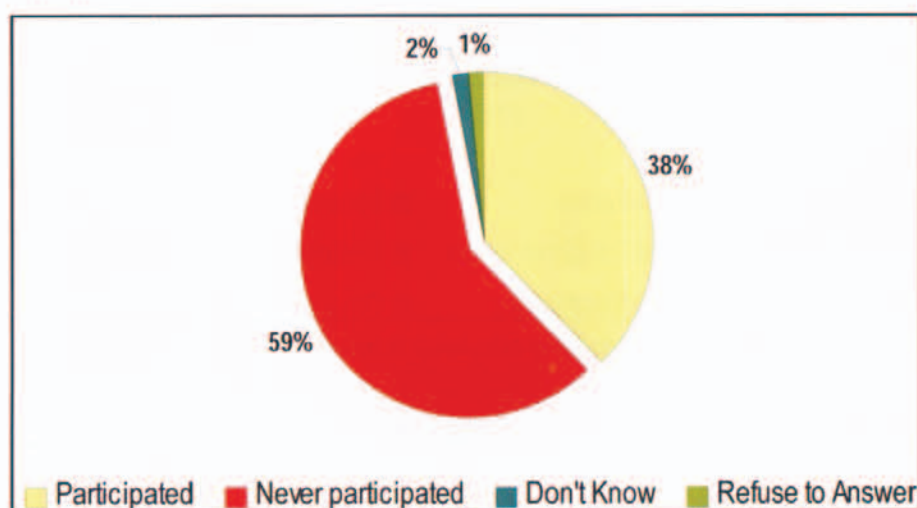


Figure 5.39: Proportion of individual with physical disability who had participated in rehabilitation programme

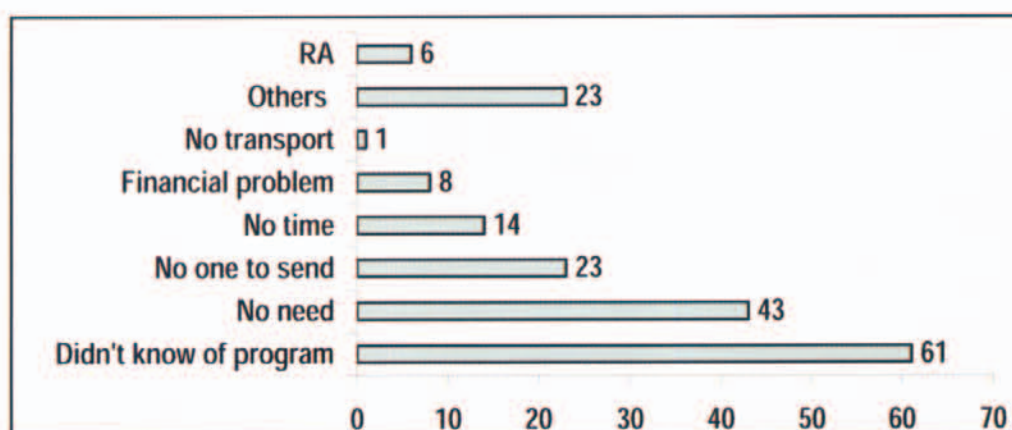


Figure 5.40: Reasons for not participating in rehabilitation programmes

5.8 Caregivers of individuals with physical disability

The main caregivers were spouses (29.51%), daughters (27.56%), sons (12.51%) and mothers (8.14%) as shown in Figure 5.41.

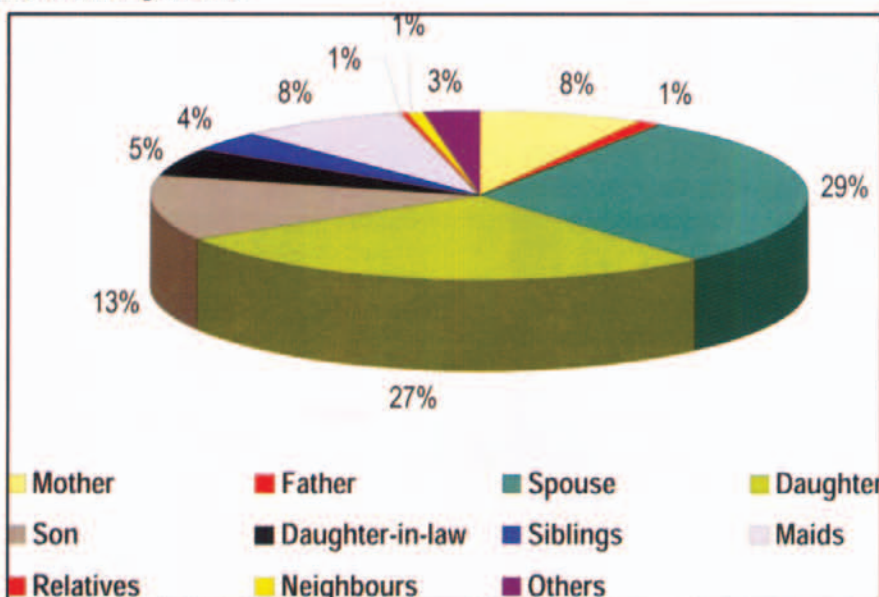


Figure 5.41: Main caregiver providing assistance to individuals with physical disability

In most cases more than one caregiver was involved. The most common caregivers identified were daughters, spouses, sons, daughter-in-law, maids, mother and father (Figure 5.42).

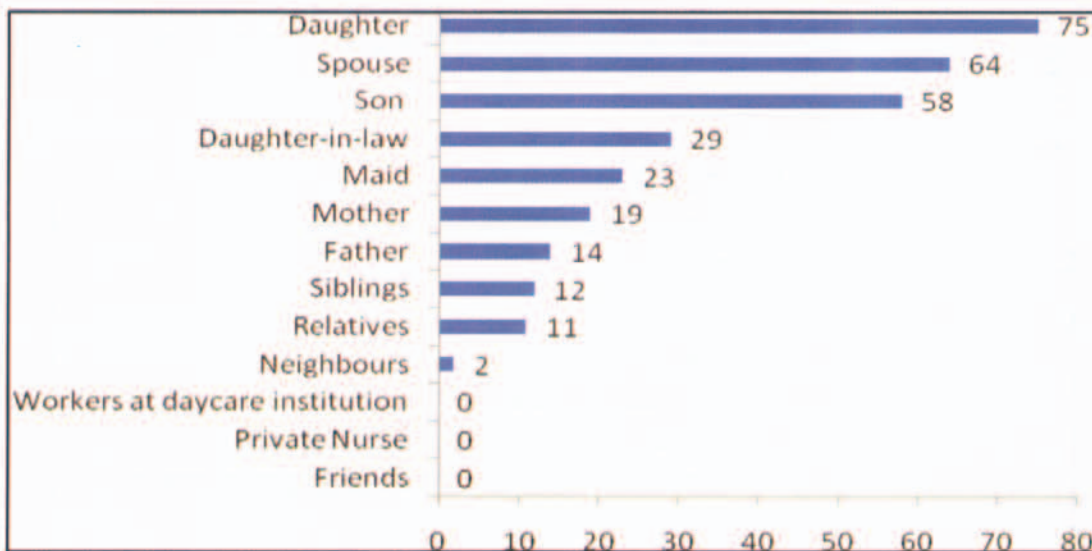


Figure 5.42: Frequency of most common caregivers for those who need assistance in personal ADL

6. DISCUSSIONS

6.1 Prevalence

The prevalence of physical disability in NHMS II was 3.2 per 1000 populations whereas in this survey it was 6.3 per 1000 population. There was a progressive increase with age especially after the age of 50 and 75.

WHO's estimate of disability prevalence is 10% of the population. However, this includes all types of disability. United Nations Disability Statistics Database (DISTAT) (1988b) estimates disability prevalence ranges from 0.2% to 20.9%. According to the report, a large variation is mainly due to differences in operational definitions and approaches in the measurement and estimation. Studies by Chamie (1995) and WHO (1989, 1995 and 1990) found that surveys using impairment-focused screening questions produced the lowest prevalence rates, ranging from 0.3% to 5.0%. Surveys using activity-focused screening questions produced the highest prevalence rates ranging from 7.1% to 20.9%. Previous works have shown that cultural differences, different disability definitions and different methods of data collection can also affect the estimates of people with disabilities.

The Australian Institute of Health and Welfare in its report "The Definition and Prevalence of Physical Disability in Australia" (We & Fortune 1999) reported an overall disability prevalence of 18% and physical disability prevalence of 11.9%. It used the activity-focused screening questions. In NHMS III, the questions were impairment-focused with emphasis on the physical disability population. Hence, it was not surprising that the prevalence of physical disability in this survey showed a lower rate.

This survey did not identify the different disabling conditions causing physical disability eg. neurological, musculoskeletal, respiratory, circulatory causes etc. The physical disability was classified based on general causes ie injuries, illnesses, congenital and others. The type of disabilities was based on body parts affected

From this survey, the prevalence of physical disabilities was higher for males than females. In contrast, the Australian report (1999) found a higher prevalence in females. This can probably be explained again by the operational definition and questions used in the survey. The DISTAT data has shown that when impairment-based screening questions were used, the prevalence rates for males were generally higher than for females and when activity-based screening questions were used, prevalence rates were similar for females and males and in some cases the rates for females were higher.

6.2 Monthly income

Almost one third of individuals with physical disability are from households living below poverty line using a cut-off point of RM 700. This cut off point is an average estimate of RM 661 for Peninsular Malaysia, RM 888 for Sabah and RM 765.0 for Sarawak (Ninth Malaysian Plan 2006-2010). The cut off point may be too low for people with disabilities because their need for higher expenditure by virtue of their physical disability.

6.3 Urban-Rural Distribution, Ethnic Distribution And States

As compared to NHMS II, this survey did not find any difference in prevalence of physical disability among the urban-rural distribution and ethnicity. However, the prevalence varied widely among the states ranging from 3.3 to 11.8 per 1000 population. The five states with the highest prevalence were Negeri Sembilan, Melaka, Pahang, Kedah and Federal Territory of Kuala Lumpur. Further in depth studies are required to ascertain the above reasons.

6.4 Causes

Majority of the population survey had reported that the physical disability was due to acquired causes such as illnesses and accidents. This is quite similar with the findings from New Zealand (Disability Survey 2006) and Japan (Annual Report on Persons with Disabilities 2005).

The causes of physical disability varied widely within the age-group categories. It was found that about 60% of physical disabilities amongst children were due to congenital causes. In adults, 33% of physical disabilities were due to illness and 30% were due to accidents and only 22% were due to congenital causes. In the elderly, 52% were due to illness and 22% were due to accidents.

The findings of this survey concur with the Japan Annual Report on Persons with Disabilities in 2005 which reported that almost 60% of the persons with physical disabilities became disabled at the age of 40 or older. The commonest cause reported was illness and accidents amongst adults.

6.5 Impact of Physical Disability On Children's

In this survey 37 children aged between 7- <18 years were reported to have physical disability giving a prevalence of 2.8 per 1,000 population.

6.5.1 Functional independence

It was noted slightly more than a third of children with physical disability aged 7 to less than 18 years old were partially or totally dependent on their caregivers in the various areas of self care. It was also found that the more severe the physical disability, the more adverse impact it had on the functional independence and community participation of these children. This concurs with the study on school-aged children with cerebral palsy by Azaula et al. (2000) that shows children with quadriplegia scored significantly lower than did the children with diplegia in areas of self-care/sphincter control, transfers/locomotion, and communication/social cognitive skills both on the WeeFIM and FIM. Hence, functional limitations are highly related to the requirements for caregiver's assistance.

This survey highlighted the heavy reliance of school-aged children with physical disability on their caregivers for their mobility as 68% of those who needed help for their mobility were carried around and only one of them (6.5%) used wheelchair.

It is alarming to note that only 60.6% of the school-aged children in this survey were reported to have verbal communication, 25.5% used gestures to communicate and 13.9% did not communicate at all but none of them used any communication aids. Further study is required to look into the reasons for

the lack of verbal communication among children with physical disability. More professional and public awareness, training and financial support are needed on the use of AAC (Augmentative and alternative communication) aids and be part of the early intervention programme as proposed by Romski and Sevcik (2005).

6.5.2 Schooling / level of education

Only 68.5% of Malaysian children of school going age group with physical disability attended formal education. Even among those with only two lower limbs involvement (such as those with spastic diplegia, spastic paraplegia and spina bifida), 26% did not receive formal education. However, we were unable to determine the proportion of them who were not accepted or sent to school because of associated intellectual disability and / or behaviour problems from those who were discriminated because of societal or environmental limitation such as absence of appropriate wheel-chair friendly school.

Mancini et al. (2000) found that from their study that school participation is a highly complex process. Successful full participation in school requires the physical capabilities along with a specific set of social skills. Information about the child functional abilities is more important in determining the participation outcome of the child than the type and severity of the impairment. However, severity of the impairment is important in the level of the participation i.e. full or limited participation.

Stevens et al. (1996) reported in their study that higher-functioning adolescents with physical disabilities studying in public school reported good self-esteem, strong family relationships and had more positive attitudes toward school, teachers, and their fellow classmates than adolescents in the national sample. However, they participated in fewer social activities and fewer had plans for postsecondary education. This implies that even higher functional adolescents with physical disability may end up less employable when they reach their adulthood.

6.5.3 Access to public places

It was found that school-aged children with physical disability were twice less likely to be taken to public places (i.e. more housebound) compared to those without physical disability though this was not statistically significant. Most of the children with physical disability who were housebound were those with all four limbs involvement, and lack of transport was quoted as the reason in about a third (34.4%) of them. This may suggest that lack of suitable mobility aid and means of transportation is important barrier to societal participation.

Similar findings were also noted by Blum et al. (1991) where over 80% of their adolescents with cerebral palsy and spina bifida aged 12-22 years despite having a best friend and two to 10 other close friends, their relationships involved extremely limited out-of-school contact and very infrequent participation in organized social activities.

Bottos et al. (2001) showed that societal participation among children with tetraplegic cerebral palsy improved significantly after the provision of powered wheelchairs.

Schoenmaker et al. (2005) in another study on children with spina bifida found that being independent in mobility contribute more to health-related quality of life than being independent in self-care or being wheelchair-dependent.

6.6 Impact Of Physical Disability On Adults

In this survey, a total of 171 adults aged from 18 to less than 60 years with disabilities were interviewed. The prevalence was 5.9 per 1,000 populations. It increased with age especially after the age of 50. There were also more males (7.8 per 1,000) than females (4.3 per 1,000) with physical disabilities in this age group. About three quarters of adults with physical disability in the survey were married and 4.3% were divorced. However, there was no detailed data as to whether physical disability occurred before or after marriage or divorce.

6.6.1 Functional Independence

Functional independence is the ability to perform daily living tasks without help. The achievement of functional independence ensures that individuals can participate fully in life situations that are meaningful and purposeful. Whether experiencing a physical disability or not, participation in activities of daily living or life occupations is essential to health and well-being. Independence in mobility is the capacity to move from one position in space (sitting, lying down, standing, etc.) to another position to enable participation in normal daily routines and activities. Functional mobility includes bed mobility, transfers, ambulation, wheelchair mobility, driving, and taking public transportation. In this survey, 9% to 31% of adults with physical disabilities are partially or totally dependent for their core functional activities and the incremental difficulty was in the following order: eating, bathing, dressing, use of toilet, mobility and doing housework. This finding is obviously directly related to the increasing difficulty in the tasks involved. As reported, inability to communicate verbally only involved less than 5% of the population surveyed.

6.6.2 Level of Education

The education level of adults with physical disability is unsatisfactory as 13% never attended school and only 9% had tertiary education. About a third of the surveyed population only had primary education. The results also implied that the more severe the physical disability, the higher the proportion of those with poor education level. There are still many barriers towards inclusion of students with physical disabilities in mainstream schools. As well as the generally negative attitudes towards people with disabilities, many factors more specific to the educational system exist.

The Malaysian school system is highly examination oriented leading to the impression that for students who are unlikely to succeed in national examinations; there is little benefit of schooling. Class sizes are also large making it difficult for teachers to allow individualized teaching and learning programmes. Even if accessibility to schools may not be a big problem but accessibility within the school due to multistory complexes and the need to go from one classroom to another for different subjects and activities are very often the problem. Finally, there are limited number of teachers who have received any specialized training in the area of special educational needs, and those without training often lack confidence in their ability to adapt their skills to teaching pupils with special needs.

The U.S National Council on Disability (NCD) in 2003 reported that for nearly two decades, there have been significant positive results for students with disabilities which included the percentage of students with disabilities graduating from high school with a diploma has risen steadily in recent years (51.7% in 1994 to 55.4% in 1998), the percentage of adults with disabilities who report completing high school increased significantly between 1986 and 2000 (61% in 1986 to 78% in 2000) and the number of students with disabilities dropping out of high school has begun to decrease (35% dropped out in

1994, compared to 31% in 1998). More than 50% of students with disabilities enrolling in postsecondary education persist toward a degree or credential. Nearly all public postsecondary institutions enroll students with disabilities (approximately 98% of public institutions in 1998) and most postsecondary education institutions enrolling students with disabilities provide some level of services, supports, or accommodations to assist their access to education. However, the council also reported that students with disabilities continue to lag behind their cohorts without disabilities in terms of postsecondary academic preparedness and youth with disabilities drop out of high school at twice the rate of their peers without disabilities.

Comparing the situation in Malaysia based on this survey, the country is clearly far from reaching these achievements but based on this report and other similar studies, objective measures can be taken to improve the provision of education for people with physical disabilities as education can help transform the lives of people. Completion of postsecondary education, including vocational-technical training, significantly improves the chances of securing gainful and satisfying employment and achieving financial independence.

6.6.3 Employment and Income

In this survey, 40 % of the adults with physical disability are unemployed. The U.S. Census of Population and Housing (2000) reported that only 49% of individuals with disabilities are employed versus 79% of individuals without disabilities. This also concurs with the study by Castree and Walker (1981) that found 34% of their young adults with spina bifida were employed. The reasons for their unemployment are likely to be multi-factorial and they include the severity of the physical disability, lack of functional independence, associated co-morbidities, emotional and psychosocial factors such as low self-esteem, stress and poor education and lack of disabled friendly work-place and employment policies. The quality of life for individuals with disabilities is improved dramatically through increased participation in meaningful employment, community involvement and social acceptance. However, for individuals who do not obtain a degree in a postsecondary education programme, prospects for finding meaningful and remunerative employment are increasingly limited. According to a Center of Disability Studies, Hawaii report by Stodden, Conway and Chang in 2002, individuals with disabilities are less likely to be employed than individuals without disabilities, across all age groups. According to a study by Stoddard et al. in 1998, of those people with disabilities who are employed, less than one half of one percent are professionals. The vast majority of individuals with disabilities who are employed work at low paying, non-professional jobs which require no higher education, are associated with less prestige, and provide no security, room for advancement, or significant medical/retirement benefits. This information is important in the planning for the promotion of employment of people with disabilities as the appropriate guideline and policies are put in place to provide equal opportunities to people with disabilities in terms of education and employment.

The personal monthly income of the adults with physical disability is very low with more than half (57%) earning less than RM 1000 monthly and 20% earning less than RM 400. 49.3% of these adults with physical disability actually live below the poverty line. Analysis of the income based on types of physical disability did not show any pattern. A report by Lee and Engler for the Canadian Council on Social Development in 2002 stated that individuals with disabilities were significantly more likely to be in poverty than those without disabilities in every city examined and in some communities the poverty rate among persons with disabilities was more than double that for persons without disabilities.

6.6.4 Access to Public Places

Over a quarter of the survey population in the adult with physical disability were housebound and these were highest in those with both lower limb involvement. This implies that these were people who were non-ambulant or with impaired mobility most likely requiring wheelchair and ambulation aids. The accessibility in the community and public places are still very unsatisfactory. Access to public transportation is also unsatisfactory and these factors may contribute to this high incidence of being housebound.

6.6.5 Access to Internet

As stated before, only 10.9 % of adults with physical disabilities had internet access. This is in the context of surfing the internet. A study by Kaye (2000) in the United States of America found that individuals with disabilities who do not have a college degree are significantly less likely to own a computer or reap the professional and social benefits of electronic "networking" than individuals with disabilities who have graduated from college. It was found that 12.7 % of non-graduates with disabilities own computers and 46.5 % for people with disabilities who have obtained college degrees. This can be correlated to the level of education. This lack of computer access is a potentially significant problem for people with disabilities as assistive technology is an important tool for overcoming disability-related obstacles while computer access helps students learn in the education and non-education setting.

6.6.6 Injuries at Home, Road and Recreational Areas

In terms of safety from injuries the incidence of injuries sustained by adults with physical disability is higher compared to their counterpart without physical disabilities at home, on the road, in recreational areas and at work place. However, it was only statistically significant with regards to injury at workplace among the two groups.

6.7 Impact of Physical Disability on the Older Persons

In this survey, the prevalence of physical disability was shown to be higher among older population. Therefore it is very important for us to look at the impact of their physical disabilities on their daily living. The impact of the disability will be discussed according the impact on their personal and domestic activities to as far as their accessibility in the community.

6.7.1 Personal and Domestic ADL

In this survey, older persons with physical disability were seen to be more dependent or needed more help compared to those older persons without physical disability. This is similar to what was concluded in a study that examined the relationship of functional limitations to disability among community-dwelling older persons in Netherlands (Gertrudis et al. 1999). They found that the influence of functional limitation was generally highest for ADL/IADLs.

In this survey, as expected when comparing those with and without disability, it was found that those with physical disability needed help most. However, majority of the respondents were independent in terms of domestic ADL and it was found that eating was the task that they least needed help. Most of the 'help needed' were for tasks such as doing housework, toileting and bathing. This finding concurred with a joint study carried out by ISIS and LPPKN in 1991 involving older person in urban areas in Malaysia, where it was found that the lowest percentage of assistance needed was feeding (Cho & Tey 1998). The top five in the list of 'needed assistance' were cleaning house (93.7%), preparing meals (91.8%), washing clothes (85.6%), going to doctor (85.3%) and shopping (74.2%). A survey on health and social status of elderly urban population in Sri Lanka involving Sinhalese elderly also found that the commonest impaired ADL were bathing and feeding (Nugegoda & Balasuriya 1995).

6.7.2 Community ADL

The mobility of older persons in the community i.e their access to public places was used as proxy to assess the community ADL. Compared to those without disability, the mobility of those with physical disability was most affected and increased with severity of their physical disability. Half of the older persons with physical disability surveyed did not have access to public places. The commonest mode of mobility among older persons with or without physical disability was using walking aids.

6.7.3 Injuries at home, road and recreational area

In this survey, as expected the older persons with physical disability were less prone to injuries on the road and recreational area since majority of them did not have access to public places. Findings from the survey showed that older persons with disability were more prone to home injury. Home, not only is the place where older persons spend most of their time, it is also an important setting for non-fatal unintentional injuries. Contributing factors include loss of muscle strength, flexibility, and impaired balance.

In a household-based survey involving 800 city inhabitants on unintentional non-fatal home-related injuries, falls were the most common form of injury (Aiptekin et al. 2007). Ghodsi et.al. (2003) also found that falling on the ground was the most common kind of fall and 77% had occurred at home. Injury rates were highest among the aged (65 years and older). Multiple analysis revealed that those with low income, living alone and single or divorced had a high risk for injury at home. These characteristics reflect the condition of older persons.

Falls in itself can cause further injury and disability among older persons. Hence, prevention of falls and other types of home injuries among the older persons is very important, especially so for those at high risk such as those living alone and with low income. Appropriate railings, good lighting and non-slip flooring are important to make the home environment safer for the older persons.

6.7.4 Access to internet

None of the older persons with physical disability in this survey had accessed the internet hence they are likely to lose out in obtaining information and services from the internet. Even among those without physical disability, only about 2.2% had accessed the internet. A study by Hendrike et al.(2005) on internet access among non-disabled older persons also described low rates ie only 7 percent of them have access to internet and had sought information on heart attack.

6.8 Registration and Utilization of Services among Persons with Physical Disability

In 2005, 170,455 persons had registered with Department of Social Welfare (DSW) as person with disability. Among them, 57,361 had physical disability (including cerebral palsy), 66,130 had learning disability, 16,302 had visual disability, 26,294 had hearing disability, and 4,368 were other types of disabilities (Jabatan Kebajikan Masyarakat 2007).

Based on the prevalence rate of 6.3 per 1,000 identified in this study, the estimated number of persons with physical disability in Malaysia is 130,168. To date, person with physical disability registered is only about two fifth (44%) of the expected number.

Almost 90% of older persons with PD did not register with DSW. Two third of the adult group and one third of the children group also did not register. There has to be emphasis on registration of all persons with disabilities including those with PD regardless of age to avoid underestimation of total number of persons with disabilities in the country. Comprehensive data will ensure better planning for services to meet the needs of persons with disability.

Large increase in the population of very disabled people are predicted for most parts of the world due to aging population, chronic degenerative diseases as well as infectious disease and injury (Hartwood et al. 2004) and this has major implication with regards to disability service planning and provision.

6.8.1 Access and Utilization of services

In this survey, 59% of persons with physical disability have never participated in any rehabilitation programme. Lack of awareness of the rehabilitative services was quoted as the main reason. Other reasons quoted were 'no need for rehabilitation' (24%), 'no one to send' (13%), 'no time to go for rehabilitation' (8%), 'financial problems' (4.5%) and 'no transport' (1%).

Population estimates show that there would be approximately 9,000 children below age of 7 with PD requiring early intervention services from both the health and welfare agencies. It is also estimated that 43,000 older persons with PD require rehabilitation services as well as support services.

Approximately 13,400 children of school going age with a physical disability require services from medical, education and social agencies. Almost a third (31.5%) of these children with PD did not receive formal education as compared to 1.7% of children without PD. This study also showed that approximately 40% of the adults with PD were unemployed. The fate of the children with PD would be the same if they are not provided with education and training opportunities.

Making service available must be followed through by marketing the services as the main cause for not participating in this study was lack of awareness of the services.

The 2001 National Survey of Children with Special Health Care Needs (NCSHCN) in United States of America found that availability and adequacy of health insurance coverage were important determinants on access and utilization of their disability services. In addition, the families of one-third of NCSHCN with insurance find that this coverage is not always adequate to meet their needs, either because the benefits do not meet their needs, the charges are not reasonable, or they do not have access to the providers they need.

Rehabilitative services currently available under the Ministry of Health are provided almost free of charge for those who have registered with Department of Social Welfare. However, the provision of rehabilitative services will be severely affected if universal health-care financing scheme were to be implemented. To improve utilization of these services among children with disabilities, they have to be accessible and family-centered. To this end, health-care providers must spend enough time with the family; assure that they have the information they need; listen to the family's concerns; be sensitive to the family's values and customs; and make the parents feel like partners in their children's care.

6.9 Main Caregivers and Burden of Care

Persons with physical disabilities require variable amount of caregiving depending on severity of their disability. With regards to physical disability, individuals with four and two lower limbs affected are classified as requiring daily care (daily human help for personal, domestic or health needs, beyond that would be needed by a healthy adult). However, those with one limb involvement were classified as requiring weekly help (Hartwood et al. 2004).

This survey shows that more than two thirds of people with PD require assistance from a caregiver; 37.6% have more than one limb involvement and would be classified as needing daily assistance from a caregiver and another 31.1% have one limb involvement and would require weekly assistance from a caregiver. With an estimate of 130,168 persons with PD in Malaysia therefore 48,943 would require daily assistance whilst another 40,482 would require weekly assistance. It must be noted that the caregiver burden here is only for those with physical disability and if other disabilities were included, the caregiver burden will be very much higher.

Health of caregivers is affected depending on the mental and functional status of the individual with physical disability. Caregiver's health is also affected depending on the types of caregiving needed. For example, the prevalence of low back pain is higher in caregivers of children needing assistance with transfers (Tong 2003). Other studies have found that the higher the level of care provided, the more negative impact it has on the caregiver's physical and mental health and their social and economic opportunities (Jamie 2004, Paula et al. 2005).

In this study, 68% of the children with PD were reported 'being carried by caregivers' as the mode for mobility. The health of parents of these children will be affected as their children become heavier and demands for caregiving increase. Parents and families of PWD need support not only in terms financial aid but also physical, mental and social support.

With the increase in the population of persons with physical disability, more caregivers, paid or otherwise will be needed. One study showed that the average number of caregivers per person with disability was 2 persons (Chio 2006). In this survey each of the persons with physical disability had two or more caregivers.

The most time-consuming duties for the caregivers are housekeeping, feeding, and toileting. Loss of caregiver's time is often a hidden cost and constitutes a major burden including loss of income for the caregiver. In the 2001 National Survey of Children with Special Health Care Needs (NCSHCN) in United States of America, nearly 30 percent of parents of children with special health care needs report that they have had to cut back on work or stop working in order to care for their children.

In this survey majority of the caregivers were informal caregivers and the female relatives (daughters, mothers, daughter-in-law) of the persons with physical disability. This is similar to a study in North Carolina where the caregivers were more likely to be women (59.5%) than men (Neuggard et al. 2007). In this survey only 5.5% mentioned a paid caregiver as one of the persons providing the caregiving, however none mentioned a paid caregiver as the main caregiver. The above scenario is likely to change with the changing patterns of the family dynamics in Malaysia.

6.9.1 Need for Family Support Services

Hence, in addition to the needs of person with physical disability, their families also need services that could help them to cope with the challenges associated with their family member's conditions. These family support services should provide family counseling (mental health care for other family members), respite care (having someone else care for the individual with disability so the parents or other family members can take a break), and genetic counseling and provision of disability caregiver's allowance.

6.10 Limitations of the survey

Due to the nature of the study design, there are several notable limitations. Among them are:-

- a) The findings in this survey are based on a sample survey, and while they are nationally representative, many items in the survey questionnaire are subjective and only depend on families' experiences, perceptions and may subject to recall bias.
- b) The information derived on physical impairment and functional dependence is at best semiquantitative. Standardized tools such as FIM (Functional Independence Measure for Adults) or WeeFIM (Functional Independence Measure for Children) were considered too time consuming and expensive for survey of this magnitude. However in retrospect, since the number of persons with physical disability is not too large, the use of FIM or WeeFIM and AAQ (Amount of Assistance Questionnaire) might be feasible and perhaps could help to quantify the burden of care better. These tools are often used to justify request for extra resources (personal, educational, financial and community programme) because of functional limitations (Azaula et al. 2000).

- c) Only a selected number of items were thought to have important impact on person with physical disability were chosen as this is only part of a larger study. Some other equally important area such as the impact on the psychosocial health was not included. These were best determined using validated quality of life tools such as SF 36 etc.

7. CONCLUSIONS

Results of the NHMS III survey on physical disability show a two fold increase in the prevalence of physical disability over the past ten years. The survey also highlights some of the key areas where physical disability can greatly impact the individual's function. It has identified the areas of needs and burden of care, and emphasized again that these problems require multisectorial involvement and commitment from the government, non-government and private agencies.

8. RECOMMENDATIONS

The recommendations focus on two frontiers, firstly as a response to the major findings of this survey and secondly with regards to the future research on disability as a whole.

- 8.1 Almost a third of Malaysian children with physical disability did not receive formal education and we need to find out the main barriers. This may be contributed by many factors such as personal and family levels, co-morbid conditions and environmental barriers (such as lack of mobility aids and transport, and lack of wheel-chair friendly school environment or school policies). Therefore an offshoot research exploring these contributing factors is paramount to enable us to plan intervention to ensure that no children with physical disability are left out from receiving formal education.
- 8.2 It is alarming that only 60 % of the children with physical disability communicate verbally and almost 14% do not communicate at all. There is a need to explore this further to see whether or not they were due to lack of proper early assessment and intervention of communication problems. The lack of speech therapists and audiologists both in hospital and primary health care settings in many parts of Malaysia needs urgent attention by our policy makers. For those children with limited potential for verbal communication, the availability and broader use of Alternative and Augmentative Communication (AAC) aids, be it low or high tech AAC, needs to be introduced. Currently the lack of AAC usage is partly contributed by awareness, lack of training and support as well as cost constraint but could be overcome by concerted efforts by all stakeholders including the policy and fund managers in Ministry of Health and Ministry of Education.

- 8.3 It is saddening to note that 40.5% of adult with physical disability were unemployed. The reasons for unemployment among these adults are likely to be multi-factorial and need further exploration. The information obtain could be very important for our nation to tap into these potentially economically productive group of individuals in order to ensure equity in employment opportunity and to remove all discrimination and artificial barriers in our society. In this survey, adults with physical disability are also more prone to injury at workplace. Hence, appropriate job-matching and legislation heading towards disabled friendly workplace will be some of the important positive steps.
- 8.4 Ninety percents of older persons with physical disability were not registered with the Department of Social Welfare in this survey. The survey also confirms the negative impact physical disability can have on older persons functional independence and hence lead to heightened burden of care for his/her family. As the initial step to actually quantify the magnitude of the problems, older persons with physical disability and loss of functional independence need to be registered with our Department of Social Welfare. The provision of disability caregiver's allowance calculated from standardized tools that can more accurately quantify the burden of care also needs to be seriously considered by the relevant agencies in order for our nation to achieve a truly caring society. Other assistance like provision of respite care and flexi-working hours for the caregivers should also be explored.
- 8.5 Disability research should be further encouraged, enhanced by providing appropriate funding and training. The acquisition of simple validated tools such as WeeFIM and FIM should be looked into. Promotion of use of standardized classification of disability within the WHO ICF Framework will go a long way to benchmark Malaysia with other leaders in the field of disability but in clinical practice and research.
- 8.6 Disability issues should remain an important research topic in NHMS IV.

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APPENDIX

APPENDIX

Table 1: Prevalence of physical disability by socio demographic

	Number of Respondent	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
National	351	130168	0.63	0.56	0.70
Age Group					
0-4	15	5410	0.3	0.1	0.4
5-9	24	8526	0.4	0.2	0.5
10-14	18	6538	0.3	0.2	0.4
15-19	12	4906	0.3	0.1	0.5
20-24	12	4506	0.3	0.1	0.5
25-29	14	5124	0.4	0.2	0.6
30-34	13	4876	0.4	0.2	0.6
35-39	24	9122	0.7	0.4	1.0
40-44	19	7222	0.5	0.3	0.7
45-49	21	7945	0.6	0.4	0.9
50-54	30	11011	1.0	0.6	1.3
55-59	31	11667	1.3	0.8	1.7
60-64	30	11239	1.8	1.2	2.5
65-69	31	11787	2.3	1.5	3.1
70-74	21	7209	2.2	1.3	3.2
75-79	20	7271	4.1	2.3	5.8
80+	16	5809	4.2	2.2	6.2
Age according to services provided					
< 7 y.o	25	9110	0.3	0.2	0.4
7 - < 13 y.o	26	9170	0.3	0.2	0.4
13 - < 18 y.o	11	4237	0.2	0.1	0.4
18 - < 60 y.o	171	64337	0.6	0.5	0.7
60 - < 75 y.o	82	30235	2.1	1.6	2.5
75 - < 85 y.o	34	12392	4.5	3.1	6.0
85 and above	2	689	1.6	-0.6	3.7

Table 1: Prevalence of physical disability by socio demographic (continue)

	Number of Respondent	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Gender					
Male	194	72680	0.8	0.6	0.9
Female	157	57489	0.5	0.4	0.6
Ethnicity					
Malays	207	75691	0.6	0.6	0.7
Chinese	71	28984	0.7	0.5	0.9
Indians	31	12054	0.7	0.5	1.0
Other Bumis	34	10711	0.5	0.3	0.6
Others	8	2729	0.3	0.1	0.5
Residence					
Urban	194	79232	0.6	0.5	0.7
Rural	157	50937	0.7	0.6	0.8
State					
Johor	30	11459	0.5	0.3	0.7
Kedah	37	13102	0.9	0.6	1.1
Kelantan	27	8915	0.7	0.4	1.0
Malacca	13	6388	1.1	0.4	1.9
N. Sembilan	24	9169	1.2	0.7	1.8
Pahang	26	9918	0.9	0.6	1.2
Penang	18	6263	0.6	0.3	0.9
Perak	17	6862	0.4	0.2	0.6
Perlis	4	1353	0.7	0.1	1.3
Selangor	50	20254	0.5	0.4	0.7
Terengganu	19	6469	0.8	0.5	1.1
Sabah	38	11507	0.5	0.4	0.7
Sarawak	21	8093	0.4	0.2	0.6
W.P. K. Lumpur	24	9446	0.8	0.4	1.2
W.P. Labuan	3	969	0.3	0.0	0.7

Table 1: Prevalence of physical disability by socio demographic (continue)

	Number of Respondent	Estimated Population	Prevalence (%)	95% CI	
				Lower	Upper
Household Income					
Less than RM 400	44	15623	1.0	0.7	1.3
RM 400 - RM 699	68	24602	0.8	0.6	1.1
RM 700 - RM 999	49	17319	0.7	0.5	1.0
RM 1000 - RM 1999	82	30815	0.6	0.4	0.7
RM 2000 - RM 2999	42	15990	0.5	0.3	0.7
RM 3000 - RM 3999	18	7369	0.5	0.2	0.7
RM 4000 - RM 4999	9	3313	0.4	0.2	0.7
RM 5000 & above	24	9574	0.5	0.3	0.8
Unclassified	15	5563	0.7	0.4	1.1

Table 2: Impact of functional domain by type of disability among children aged 7 - <18 years

Functional Domain - Personal ADL, mobility & domestic ADL	Head, face & neck only											
	Independence				Partially Dependent				Totally Dependent			
	95% CI				95% CI				95% CI			
	n	%	L	U	n	%	L	U	n	%	L	U
Self care												
Eating	7	89.3	68.2	110.3	1	10.8	-10.3	31.8	0	0.0	0.0	0.0
Bathing	7	89.3	68.2	110.3	1	10.8	-10.3	31.8	0	0.0	0.0	0.0
Dressing	7	89.3	68.2	110.3	1	10.8	-10.3	31.8	0	0.0	0.0	0.0
Use of toilet	7	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Mobility	8	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Do housework	2	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Functional Domain - Personal ADL, mobility & domestic ADL	One upper limb only											
	Independence				Partially Dependent				Totally Dependent			
	95% CI				95% CI				95% CI			
	n	%	L	U	n	%	L	U	n	%	L	U
Self care												
Eating	3	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Bathing	3	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Dressing	3	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Use of toilet	3	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Mobility	3	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Do housework	1	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0

Table 2: Impact of functional domain by type of disability among children aged 7 - <18 years (continue)

Functional Domain - Personal ADL, mobility & domestic ADL	One lower limb only											
	Independence				Partially Dependent				Totally Dependent			
	95% CI				95% CI				95% CI			
	n	%	L	U	n	%	L	U	n	%	L	U
Self care												
Eating	1	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Bathing	1	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Dressing	1	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Use of toilet	1	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Mobility	1	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Do housework	1	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Functional Domain - Personal ADL, mobility & domestic ADL	Both lower limbs only											
	Independence				Partially Dependent				Totally Dependent			
	95% CI				95% CI				95% CI			
	n	%	L	U	n	%	L	U	n	%	L	U
Self care												
Eating	4	61.2	25.5	96.9	3	38.8	3.1	74.5	0	0.0	0.0	0.0
Bathing	4	61.2	25.5	96.9	3	38.8	3.1	74.5	0	0.0	0.0	0.0
Dressing	4	61.2	25.5	96.9	3	38.8	3.1	74.5	0	0.0	0.0	0.0
Use of toilet	3	44.1	5.0	83.2	4	55.9	16.8	95.0	0	0.0	0.0	0.0
Mobility	3	44.1	5.0	83.1	3	42.0	2.8	81.2	1	14.0	-12.8	40.7
Do housework	1	52.4	-32.9	137.7	1	47.6	-37.7	132.9	0	0.0	0.0	0.0

Table 2: Impact of functional domain by type of disability among children aged 7 - <18 years (continue)

Functional Domain Personal ADL, mobility & domestic ADL	One upper and one lower limb only											
	Independence				Partially Dependent				Totally Dependent			
	95% CI				95% CI				95% CI			
	n	%	L	U	n	%	L	U	n	%	L	U
Self care												
Eating	3	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Bathing	3	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Dressing	3	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Use of toilet	3	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Mobility	3	100.0	-	-	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Do housework	0	0.0	0.0	0.0	1	100.0	-	-	0	0.0	0.0	0.0
Functional Domain - Personal ADL, mobility & domestic ADL	All four limbs only											
	Independence				Partially Dependent				Totally Dependent			
	95% CI				95% CI				95% CI			
	n	%	L	U	n	%	L	U	n	%	L	U
Self care												
Eating	1	10.2	-9.8	30.2	8	89.8	69.8	109.8	0	0.0	0.0	0.0
Bathing	1	10.2	-9.8	30.2	8	89.8	69.8	109.8	0	0.0	0.0	0.0
Dressing	1	10.2	-9.8	30.2	8	89.8	69.8	109.8	0	0.0	0.0	0.0
Use of toilet	1	10.2	-9.9	30.2	8	89.8	69.8	109.9	0	0.0	0.0	0.0
Mobility	2	24.3	-6.9	55.5	1	13.2	-11.8	38.2	6	62.5	28.0	97.0
Do housework	1	41.8	-36.0	119.7	0	0.0	0.0	0.0	1	58.2	-19.7	136.0

Table 2: Impact of functional domain by type of disability among children aged 7 - <18 years (continue)

Functional Domain - Personal ADL, mobility & domestic ADL	Other combinations											
	Independence				Partially Dependent				Totally Dependent			
	95% CI				95% CI				95% CI			
	n	%	L	U	n	%	L	U	n	%	L	U
Self care												
Eating	4	65.5	24.2	106.7	2	34.5	-6.7	75.8	0	0.0	0.0	0.0
Bathing	4	65.5	24.2	106.7	2	34.5	-6.7	75.8	0	0.0	0.0	0.0
Dressing	4	65.5	24.2	106.7	2	34.5	-6.7	75.8	0	0.0	0.0	0.0
Use of toilet	4	65.5	24.2	106.8	2	34.5	-6.8	75.8	0	0.0	0.0	0.0
Mobility	4	65.5	24.2	106.7	0	0.0	0.0	0.0	2	34.5	-6.7	75.8
Do housework	1	42.0	-41.3	125.3	0	0.0	0.0	0.0	1	58.0	-25.3	141.3
Functional Domain - Personal ADL, mobility & domestic ADL	OVERALL											
	Independence				Partially Dependent				Totally Dependent			
	95% CI				95% CI				95% CI			
	n	%	L	U	n	%	L	U	n	%	L	U
Self care												
Eating	23	62.6	46.1	79.2	14	37.4	20.8	53.9	0	0.0	0.0	0.0
Bathing	23	62.6	46.1	79.2	14	37.4	20.8	53.9	0	0.0	0.0	0.0
Dressing	23	62.6	46.1	79.2	14	37.4	20.8	53.9	0	0.0	0.0	0.0
Use of toilet	22	60.8	43.6	78.0	14	39.2	22.0	56.5	0	0.0	0.0	0.0
Mobility	24	65.1	48.7	81.6	4	11.2	0.1	22.3	9	23.7	9.2	38.2
Do housework	7	59.9	26.5	93.3	2	18.6	-9.2	46.4	2	21.5	-9.5	52.5

Table 3: Impact physical disability on safety at home, road, recreational area and school among children aged 7 - <18 years

Safety - had injury in past one year	With physical disability				Without physical disability				
			95% CI				95% CI		
	n	%	Lower	Upper	n	%	Lower	Upper	
Home	Yes	2	5.5	-2.1	13.1	1080	8.0	7.4	8.6
	No	34	94.5	86.9	102.1	11912	92.0	91.4	92.6
Road	Yes	2	6.0	-2.1	14.2	888	6.8	6.3	7.3
	No	33	94.0	85.8	102.1	12126	93.2	92.7	93.7
Recreational area	Yes	0	0.0	0.0	0.0	455	3.5	3.2	3.9
	No	35	100.0	-	-	12530	96.5	96.1	96.9
School	Yes	0	0.0	0.0	0.0	880	7.2	6.7	7.8
	No	26	100.0	-	-	11343	92.8	92.2	93.3

Table 4: Impact on education level attained, comparing those with and without physical disability among adult aged 18 - <60 years

Education level attained	With physical disability				Without physical disability			
			95% CI				95% CI	
	n	%	Lower	Upper	n	%	Lower	Upper
Never schooled	23	13.0	8.0	18.0	1671	5.4	5.1	5.8
Primary education	57	32.7	25.5	39.9	7482	25.3	24.6	26.0
Secondary education	74	43.7	36.1	51.4	16275	56.7	55.9	57.5
Tertiary education	14	9.0	4.5	13.4	3244	11.8	11.2	12.5
Unclassified	3	1.6	-0.2	3.4	220	0.8	0.6	0.9

Table 5: Impact on employment status, comparing those with and without physical disability among adult aged 18 - <60 years

	With physical disability				Without physical disability			
	n	%	95% CI		n	%	95% CI	
			L	U			L	U
Paid job	53	31.6	24.6	38.6	13192	46.5	45.7	47.3
Self-employed	30	17.5	11.7	23.2	5513	18.6	18.0	19.2
Retired	12	7.4	3.4	11.4	635	2.3	2.1	2.5
Still schooling	5	3.0	0.4	5.6	1009	3.6	3.3	4.0
Unemployed	69	40.5	33.3	47.8	8441	29.0	28.4	29.6

Table 6: Impact on employment by type of disability

Employment	Head, face and neck only			
	95% CI			
	n	%	L	U
Paid job	16	43.7	28.2	59.1
Self-employed	6	15.1	3.8	26.4
Retired	2	5.9	-2.1	13.8
Still schooling	0	0.0	0.0	0.0
Unemployed	14	35.4	20.6	50.2
	One upper limb only			
	95% CI			
	n	%	L	U
Paid job	11	39.1	20.6	57.5
Self-employed	6	21.2	5.8	36.5
Retired	2	7.7	-2.7	18.0
Still schooling	1	3.8	-3.5	11.0
Unemployed	8	28.4	11.3	45.4
	One lower limb only			
	95% CI			
	n	%	L	U
Paid job	12	35.2	18.8	51.6
Self-employed	8	23.2	8.8	37.7
Retired	4	11.5	0.7	22.4
Still schooling	2	6.4	-2.3	15.0
Unemployed	8	23.7	9.0	38.3
	Both lower limbs only			
	95% CI			
	n	%	L	U
Paid job	1	8.3	-7.4	24.0
Self-employed	2	15.3	-4.6	35.2
Retired	0	0.0	0.0	0.0
Still schooling	0	0.0	0.0	0.0
Unemployed	10	76.4	52.7	100.1

Table 6: Impact on employment by type of disability (continue)

	One upper and one lower limb only			
	95% CI			
	n	%	L	U
Paid job	5	21.2	3.9	38.4
Self-employed	1	3.8	-3.7	11.4
Retired	3	14.6	0.2	29.1
Still schooling	1	3.8	-3.7	11.4
Unemployed	13	56.5	37.3	75.8
	All four limbs only			
	95% CI			
	n	%	L	U
Paid job	0	0.0	0.0	0.0
Self-employed	4	42.2	10.7	73.7
Retired	0	0.0	0.0	0.0
Still schooling	0	0.0	0.0	0.0
Unemployed	6	57.8	26.3	89.3
	Other combinations			
	95% CI			
	n	%	L	U
Paid job	8	35.9	15.9	55.8
Self-employed	3	12.1	-1.1	25.2
Retired	1	3.9	-3.7	11.6
Still schooling	1	4.4	-4.1	12.9
Unemployed	10	43.7	23.0	64.5
	Overall			
	95% CI			
	n	%	L	U
Paid job	53	31.6	24.6	38.6
Self-employed	30	17.5	11.7	23.2
Retired	12	7.4	3.4	11.4
Still schooling	5	3.0	0.4	5.6
Unemployed	69	40.5	33.3	47.8

