NONCOMMUNICABLE DISEASE RISK FACTORS AMONG THE PHYSICALLY DISABLED

Elezebeth Mathews

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Achutha Menon Centre for Health Science Studies
Sree Chitra Tirunal Institute for Medical Sciences and Technology,
Thiruvananthapuram, Kerala, India

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Certificate

I hereby certify that the work in this dissertation titled “NONCOMMUNICABLE DISEASE RISK FACTORS AMONG THE PHYSICALLY DISABLED” is a certified record of original research work undertaken by Mrs Elezebeth Mathews in partial fulfillment of requirement for the purpose of award of Master of Public Health Degree under my guidance and supervision.

Dr. Biju Soman,

Assistant Professor,

Achutha Menon Centre for Health Science Studies,

Sree Chithra Tirunal Institute for Medical Science and Technology,

Trivandrum-695011

DECLARATION

I hereby declare that this dissertation work titled "NONCOMMUNICABLE DISEASE RISK FACTORS AMONG THE PHYSICALLY DISABLED" is a result of original research and it has not been submitted for the award of any degree in any other university or institution.

Thiruvananthapuram

31ST October 2008 Mrs. Elezebeth Mathews

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DEDICATED TO MY HUSBAND

Mr Pradeep M George

And

My son Rohan

For all Blessings, support and courage imparted to me

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ABBREVATIONS

BMI -Body Mass Index

DALY-Disability Adjusted Life years

NCD -Noncommunicable diseases

WHO –World Health Organization

ABSTRACT

Noncommunicable Disease risk factor among the physically disabled

Background: Non-communicable diseases are an emerging slow epidemic in the world, which is true for India too. Disabled people are known to have many disadvantages including propensity to diseases and ill health. This study explores the association between physical disability and the chances of developing Non-communicable diseases.

Methodology:

It is a retrospective cohort study done in the year 2008 in Vengannur Grama Panchayat in Thiruvananthapuram district in Kerala. The disabled people were compared with a age & sex matched non-disabled from the neighborhood. The physically disabled were identified from a baseline health survey done in 2005-06 which identified 283 households with disability in Vengannur. A total of 125 People having physical disability for more than five years were recruited for the study and they were compared with 125 age & sex matched non-disabled people selected from the neighborhoods. Data was collected using the WHO STEPS questionnaire for NCD surveillance and disability was assessed using Indian (Health Assessment Questionnaire) HAQ version. Bivariate and multivariate analysis was done to find out the association of disability with the major NCD risk factors.

Results and discussion

The prevalence for the major NCD risk factors among disabled were found to be higher like hypertension (43.2 %), alcohol use(12%),tobacco use(20.8%),Obesity(33.6%),and lack of physical activity(89.6%). However significant difference from the comparison group were found only in Hypertension with a RR of 1.32(1.04-1.6) and Lack of physical activity

5.01(2.54-9.8) Disabled females were found to suffer from added disadvantages due to their gender roles as revealed by higher rates of obesity, lack of physical activity and self reported Diabetes. Even after adjusting for known socio-demographic influences like education, occupation and marital status by logistic regression analysis, the physically disabled were found to suffer from two of the major known NCD risk factors like lack of physical activity[OR=3.94, 95% CI (1.9-8.18)] and hypertension [OR=1.76, 95% CI (1-3.13)].

In conclusion hypertension screening for the physically disabled could help in early identification and treatment. Likewise disabled friendly initiatives for promoting physical activities should be a part of NCD risk factor interventions.

CHAPTER-1

INTRODUCTION AND REVIEW OF LITERATURE

1.1 BACKGROUND

In the recent decades, the prevalence of noncommunicable diseases has increased, being responsible for sizable mortality and morbidity worldwide, especially in the Asian population. Demographic changes and changes caused in the environment and the economy are the major reasons for shift against a predominantly communicable diseases scenario. Ageing population allows manifestation of cardiovascular diseases, cancer and mental disorders which also result in high prevalence of chronic disability. It is predicted that if the current problem is not well addressed, NCD will account for 70 percent of the global burden of disease causing seven out of every 10 deaths in developing countries compared to less than half of deaths occurring now[1]

1.2 WHAT ARE NON-COMMUNICABLE DISEASES (NCD) AND WHY IS IT IMPORTANT?

Noncommunicable diseases (NCD) include heart disease, stroke, cancer, diabetes and obesity which have been neglected. Out of the estimated 56 million deaths globally, 60 percent are due to noncommunicable diseases. The NCD's were found as a problem only in developed countries while developing countries had majority of deaths due to communicable diseases. In the present decade with the changing demographic and epidemiological transition, the developing countries have a double burden of communicable and noncommunicable diseases.

1.3 CAUSES OF NONCOMMUNICABLE DISEASES(NCD)

The development of medicine in preventing and controlling disease, declined fertility rates and child survival has led to the increase in aging population which is the major determinant of the epidemic of noncommunicable diseases.[2] Globalization also directly and indirectly affects the epidemic of noncommunicable diseases

NCDs are linked to a cluster of major risk factors such as tobacco use, unhealthy diets, physical inactivity, obesity, high blood pressure, cholesterol and glucose levels that are measurable and largely modifiable.

1.4 BURDEN OF NON-COMMUNICABLE DISEASE

1.4.1 WORLD SCENARIO

Over 33 million people die a year worldwide due to chronic (non communicable) diseases including cardiovascular, cancer, diabetes and chronic respiratory diseases. By 2020, it is estimated that 70% of the global burden of disease will relate to non communicable diseases.

About 59.8% of the death is attributed to the non-communicable diseases, 31.3% due to communicable diseases, maternal and perinatal conditions and 9.1% due to injuries .[2]Global burden of disease due to DALY is 43.2% due to non-communicable diseases, 42.8% due to communicable diseases and 13.9% due to injuries.[2] The number of adults with diabetes in the world will rise from 135 million in 1995 to 300 million in the year 2025.[2]

1.4.2 ASIAN SCENARIO

Low and middle income countries suffer the greater impact of non-communicable disease with 77% of the total number of deaths in developing countries and 85% of the global Noncommunicable disease burden .[3]

Several surveys of risk factors conducted across South Asian countries have shown high and rising rates of overweight, central obesity, diabetes, high blood pressure and dyslipidemia in urban populations and at a lesser magnitude in rural populations. Cardiovascular diseases form the major contributor of mortality and disability among the South Asians. Although prevalence of hypertension varies across different regions and groups an urban prevalence of 10 percent among adults greater than 35 years of age was found to be a credible estimate.[3]

The National Health Survey of Pakistan has established a hypertension prevalence of 23 percent and 18 percent in urban and rural areas respectively.[4] Similar increased trend was found in Sri Lanka where hypertension prevalence was estimated to be 17percent and 8 percent in urban and rural areas respectively.[1]

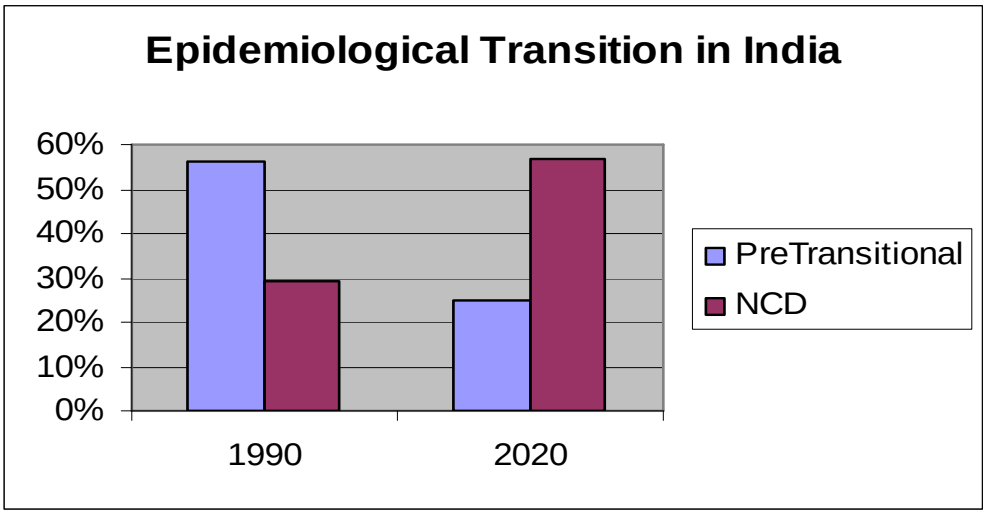
Diabetes prevalence was also found to be at the rise with increasing affluence in South Asian countries. The prevalence of diabetes is higher in urban area when compared to the rural (8 percent and 4 percent) in Bangladesh.[5] Similar increasing prevalence of diabetes is found in Sri Lanka, Nepal, Pakisthan and in India. The projections by WHO for 2020 as per the modelled estimates predict the diabetes prevalence to rise by 195 percent during 1995-2025 with 57.2 million people with diabetes in 2025.[6]

Changing patterns in food consumption with more people switching over to eating outside than from home is another challenge in urban India with more people reporting to have higher body mass index, blood pressure ,total cholesterol and diabetes.[7]

The availability of cheap vegetable oils and fats has added on to the problem in low income countries such as India and China.

Tobacco is seen to contribute to more than 12 percent of deaths in India, China and Middle East. It is predicted that in India the Tobacco attributable deaths to increase from 1.4 percent to 13.3 percent from 1990 to 2020.[8]

Table 1.1 epidemiological transitions in India



Source: K S Reddy. Lancet 1998

1.4.3 Kerala scenario

This epidemiological transition in India poses a threat in future if not controlled with effective interventions. The Kerala state is in the Stage 3 of the epidemiologic transition. Studies reveal that Kerala has the highest prevalence of Coronary Artery Disease with a rural prevalence of 7.5 percent and urban prevalence of 12 percent .[9] A study by Thankappan et al found a smoking prevalence of 35 per cent among men in the age group 15-64 years of age and 43.7 percent in the age group 35 -64 years of age.[9] The prevalence of current chewing tobacco was 26.2 percent among males and 6.2 percent among females.[10]

Diabetes prevalence in Kerala is estimated to be more than 17 percent with more number of new cases emerging between the ages of 35 to 45 years. Diabetes is also found to cause disability in the old-age.[11]

1.5 IMPORTANCE OF FOCUSSING ON THE NCD RISK FACTORS THAN THE DISEASE

- Most of the NCD burden can be attributed to several major, measurable and modifiable risk factors;
- Risk factors (mean levels in population) are present-day indicators of future diseases in the population;
- There is lag time between exposure and disease (gives a window of opportunity for action);
- Public health strategies have to be driven by trends in risk factor exposure of populations;
- NCD risk factor surveillance is feasible and affordable in developing countries.

1.6 CONCEPT OF POPULATION APPROACH AND HIGH RISK APPROACH

Two approaches have been formulated to control the epidemic of NCD. First is the preventive strategy which identifies the high risk susceptibles to offer individual protection while the population approach controls the determinants of the incidence to the population as a whole.[12] Studies support the fact that population approach is effective than the high risk approach due to the fact that “a large number of people at small risk may give rise to cases of disease than the small number who are at high risk”.

1.7 DISABILITY AND ITS PREVALENCE

Disability is a condition when a person has restrictions or lack of abilities to perform an activity in the manner or within the range considered normal for a human being. About 18.4 million people in India are disabled thus contributing to 2% of the population .[13]

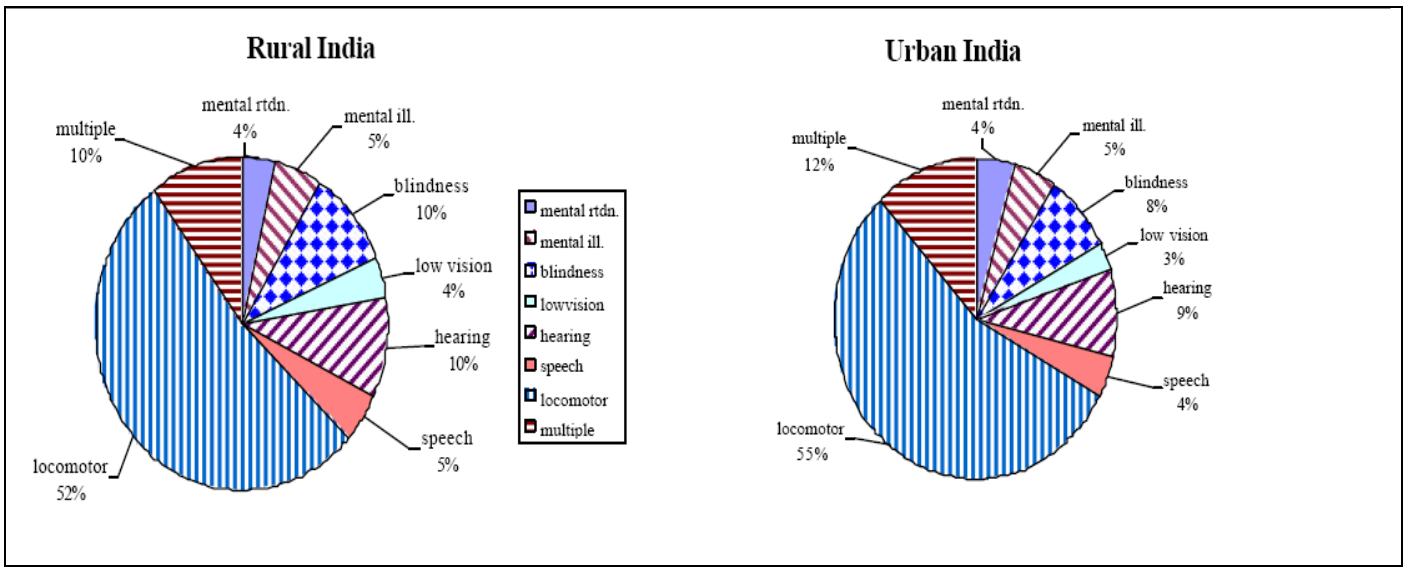
There are two broad categories of disability-the one that is acquired from birth onwards and the other that has occurred at some other point of lifetime through accidents or other morbidities. The disabilities that are included are locomotor, visual, hearing, speech, and mental disability. According to NSSO, about one third of the disabilities were since birth.

About 10.63 per cent of the disabled persons suffered from more than one type of following disabilities, (i) mental disability in the form of (a) mental retardation or (b) mental illness, (ii) visual disability in the form of (a) blindness or (b) low vision, (iii) hearing disability, (iv) speech disability, and (v) locomotor disability.(1) It was found that at All India level, out of 1000 males, 471 were never married, 448 were currently married in rural areas and 484 and 450 in urban areas respectively. About 30-31% of the disabled females are widowed, separated or divorced. Among the males, 3-7% are separated, widowed or divorced.[13]

About 55% of the disabled in India are illiterate with the mentally retarded being the highest (87%), followed by the visually impaired (70-74%). The literacy status was highest in Delhi followed by Kerala. The proportions of disabled males were 35-37% while that of females were 9-11%.

Locomotor disability constitutes 52% of the whole disabled population.

Table 2 : PERCENTAGE DISTRIBUTION OF THE DISABLED BY THE TYPE OF DISABILITY



(Source: NSS 58TH ROUND)

1.8 DISABILITY AND NONCOMMUNICABLE DISEASE

Noncommunicable diseases cause 80 percent of cardiovascular deaths world wide and 87 percent of related disability in low and middle income countries.[14]

1.8.1 Disability and hypertension

Various studies have been done to illustrate that noncommunicable disease lead to disability. A Framingham disability study revealed that among women, both long-term and current hypertension, body mass index and diabetes, were associated with disability. Among men, long-term hypertension was related to disability. But little focus has been made to find out whether disability in any form may lead to the onset of noncommunicable diseases. Another study by Simons revealed a reduction in survival time due to Hypertension, Diabetes and smoking.[16]

Studies also revealed that a cardiovascular event can worsen the disability and decrease the life expectancy by 7.5 years.[17]

1.7.2 DISABILITY AND PHYSICAL ACTIVITY

A study has revealed that 56% of the disabled reported that they did not have any leisure time physical activity when compared to the 36% nondisabled people.[18] This has huge implication on the quality of life and the general health profile as lack of physical exercise predisposes the disabled to various morbidities like diabetes, hypertension, cardiovascular diseases, it may worsen the existing disability.[19-20] So it is important to address the social as well as the physical activity of the disabled. This is particularly important because physical activity is similarly beneficial for people with or without disability and has been shown to improve quality of life and reduce functional impairment among people with disability. [21-28]

Simonsick et al examined walking activity in a group of elderly women with moderate to severe disability and found that even when degree of disability was considered, race, psychosocial factors, and specific impairments remained significant predictors of activity level.[29] Kinne et al found that barriers, motivation, and self-efficacy were predictors of exercise maintenance in a group of people with mobility impairments, but demographic factors were not.[30] Shifflett et al found that perceived benefits, facilities barriers, and health barriers were important predictors of activity level in people with disability.[31] Rimmer et al identified several barriers to physical activity for people with disability, including cost, lack of transportation, and inaccessibility .[32-34]

Some of the correlates of the physical activities of the disabled are age, general health and race.[35] Many studies that have measured the activity of patients with disability compared with people without disabilities have also confirmed lower activity (decreased frequency and decreased intensity).[36-38]

1.7.3 DISABILITY AND TOBACCO USE

Smoking prevalence among people with disabilities is nearly 50 percent higher than among people without disabilities (29.9 percent vs. 19.8 percent), according to a new study from the Centers for Disease Control and Prevention.[39]

A similar study finding in Massachusetts is seen with increased smoking prevalence among the disabled.[40]

1.7.4 DISABILITY AND OBESITY

A study by VA Campell revealed that persons with disabilities had higher rates of obesity (27.4%) than those without disabilities (16.5%) and substantial differences existed between men with disabilities (25.5%) and without disabilities (17.7%) and between women with disabilities (29.1%) and without disabilities (15.3%).[41-42]

1.7.5 DISABILITY AND ALCOHOL USE

Alcohol and other drug abuse is a problem among some clients with physical impairments

Thurer and Rogers (1984) found that 53 percent of a sample of physically impaired clients rated help with alcohol or other drug problems as a "substantial need" or "great need" among the physically impaired .[43-44]

1.7.6 DISABILITY AND DIABETES

The occurrence of disability and diabetes is very commonly studied and many studies reveal that Type 2 diabetes lead to various disabilities if not managed well. It has also been studied that long term disabled have higher chance of developing Type 2 Diabetes.[45]

1.7.7 RATIONALE OF THE STUDY

Most of the risk factors like obesity, smoking, alcohol consumption are found to be high among the disabled especially the physically disabled in the western countries.

But with the increasing incidence of injuries and violence, the disabled population is at the rise with lifelong disability. [46] This is mainly due to road traffic accidents, falls, war, riots etc. In the current scenario, it is important to identify if the disability by itself will lead to any diseases especially non communicable diseases like diabetes, hypertension and other cardiovascular diseases .The modifiable risk factors that are identified to cause NCD's like physical inactivity, alcohol consumption, smoking, and poor dietary intake are found to be high in many studies which predisposes the disabled to the development of the disease.

Due to various social, physical and psychological factors, the access, mobility and well-being of the disabled are jeopardized. This contributes to the help seeking behavior of the disabled especially physically disabled to swing on to alcohol consumption and smoking habits. Moreover due to the physical immobility due to the physical disability, the physical activities of these people are at minimal or negligible which predisposes them to obesity. Thus the

physically disabled are at risk for developing noncommunicable diseases. As the pilot phase of the national programme for prevention and control of Diabetes, cardiovascular diseases and stroke was launched on January 2008, it has a special focus on targeting the high risk groups to reduce the incidence of the noncommunicable diseases. So it is important to identify whether the physically disabled are at risk of developing noncommunicable diseases and the NCD risk factor profile of the physically disabled.

CHAPTER 2

METHODOLOGY

2.1 OBJECTIVES OF THE STUDY

- To study the profile of the noncommunicable disease risk factors among the physically disabled
- To compare and contrast the prevalence of the Noncommunicable diseases risk factors among the physically disabled and an age and sex matched comparison group.

2.2 STUDY SETTING

Study setting is Vengannur grama panchayat in Trivandrum district

2.3 STUDY DESIGN

Retrospective cohort study

2.4 SAMPLE SIZE ESTIMATION

Sample size was calculated in Epi info software 3.3.2 by taking the age-specific prevalence of smoking and alcohol consumption (NCD risk factors) which was assumed to be 38.1 and 43.6 percent respectively for the age group of 25 years to 64 years taken from a survey done in a rural area of Thiruvananthapuram District. [10]

Expected prevalence of smoking and alcohol consumption among the physically disabled were assumed to be 50 percent higher than the general population.[39, 44] .Sample sizes was calculated with 80 percent power and 95 percent Confidence interval.

Sample size calculated was 245 which was rounded off to 250.It was divided with 125 disabled and 125 age and sex matched comparison group.

2.5 SAMPLE SELECTION PROCEDURE

Samples of physically disabled for minimum period of 5 years and not bedridden were selected randomly from a database of physically disabled ,as identified through a baseline health survey(283 households) enlisted and a comparison group matched with age(with an interval of 5) and sex , with no disability was selected through neighborhood sampling.

2.5.1. Inclusion criteria: physical disability for a minimum period of 5 years, and not bed ridden as enlisted in the census database of the physically disabled.

2.5.2 Inclusion criteria of the comparison group: Non-disabled matched with age and sex of the case and the immediate neighbour to the right side of the case's house.

2.5.3 Exclusion criteria: Any disability other than physical disability, bedridden patients

2.6 STUDY TOOLS AND DATA COLLECTION PROCEDURE

Data collection was done using a semi structured interview schedule (Appendix 3) which was adapted from WHO steps questionnaire for NCD surveillance and Disability assessment schedule using Indian version HAQ(Health assessment questionnaire).The questionnaire was translated to Malayalam and then back translated to English .Both the versions were found similar. The Malayalam Translated version (Appendix 4) was pretested before

administering for data collection. Anthropometric measurements were taken to measure the height, weight, waist circumference and blood pressure. Blood pressure was measured thrice .First measurement was taken after taking the informed consent ,second one after measuring height and weight and the third measurement following disability assessment. All measurements were taken using standardized and validated instruments listed below as per the standard operating procedure [51]:

1. Blood pressure monitoring instrument: OMRON BP apparatus.

   Model: SEM- 1(HEM-7051-C12)[51]

2. Height was measured using SECA scale (stadiometer) [51]

   Model: 881 1321009

3. Weight was measured using SECA electronic weighing scale[51]

The interviewer (researcher herself) collected data after obtaining an informed consent (Appendix 1) from the participants.

2.7 VARIABLES IN THE STUDY

2.7.1 Dependent variable

Noncommunicable disease risk factors studied were

1) Hypertension, 2) Tobacco use 3) Alcohol use 4) Inadequate fruit and vegetable intake 5) Obesity 6) Physical inactivity and 7)Self reported diabetes

Study definitions

1 .Hypertension- Hypertension is defined as an elevated blood pressure with a systolic blood pressure of greater than or equal to 140 mm of Hg or systolic blood pressure of greater than or equal to 90 mm of Hg or on antihypertensives. The cut off for Hypertension was adapted from JNC 7 Stage 1.

2. Tobacco use is the use of any form of tobacco products

a. Current user of tobacco -Current user is someone who had consumed tobacco in the past 12 months.
b. Current user daily is defined when a person consumes the product daily in the past 12 months.
c. Smoking tobacco products include manufactured cigarettes, beedi, and pipes full of tobacco, hooka, and cigars.
d. Smokeless tobacco is any product which contains tobacco as a constituent consumed or inhaled .It includes snuff, chewing tobacco, betel, ghutka, khaini etc.

3. Alcohol use is defined as the use of any alcoholic products.

a. Current user of alcohol -Current user is someone who had consumed alcohol in the past 12 months.
b. Current user daily is defined when a person consumes the product daily in the past 12 months.

c. A standard alcoholic drink of Regular beer is 285ml,Single measure of spirit is 30ml, one Medium glass of wine is 120ml and one measure of aperitif is 60ml.[47]

d. Alcohol amount consumed was classified as medium risk if the amount was 41 to 60 grams of ethanol per day, high risk if the amount was 60-100 grams per day and very high risk for greater than 100 grams of ethanol per day.

3. Inadequate fruits and vegetable is defined as less than five servings of both fruits and vegetables a day.

a. One standard serving of vegetable is 80 grams depending on the type of vegetable and standard cup measure.[47](Appendix 5)

b. One medium sized fruit is one serving

4. Obesity

Obesity is classified according to WHO classification of body mass index higher than 25 kg/m2.

Body mass index was calculated by dividing weight in kilogram by height in metre squared.

5 .Physical inactivity

A person is defined as physically inactive if his/her work involves sitting or standing with walking not more than ten minutes and has no leisure time activity.[47]

6. Self reported diabetes

Diabetes was recorded as reported by the participant.

A composite index was formulated named Noncommunicable disease high risk (NCD high risk) which includes all those individuals who have three or more NCD risk factors.

2.7.2 Independent variables

1. Demographic Variables like age, sex ,marital status

Marital status was classified into living alone, which includes unmarried, widowed, or separated and living with spouse who is currently married.

2. Socioeconomic variables like educational , occupational status
    a. Educational status is classified to four years of schooling and more than four years of schooling.
    b. Occupational status is classified as employed which includes government employee, non government employee, unskilled and skilled laborers. Unemployed category includes retired, unable to work, unemployed able to work, student and homemakers.

3. Disability- It is a condition when a person has restrictions or lack of abilities to perform an activity in the manner or within the range considered normal for a human being.

a. Disability was classified as mild if the disability index was from 0.01 to 1, moderate if the disability index was from 1.01 to 2 and severe if the disability index was from 2.01 to 3.

2.8 INTRODUCING TOOLS USED IN THE STUDY

Two tools are used in this study .WHO STEPS Questionnaire was used to capture the noncommunicable disease risk factor profile of the physically disabled and comparison group and the Indian health assessment questionnaire (HAQ) to assess the disability among the physically disabled. The description of each tool is given below:

2.8.1 WHO STEPS instrument for Chronic disease risk factor surveillance[47]

This includes questionnaire and anthropometric measurement .The questionnaire includes questions on tobacco use, alcohol use, diet, physical activity, treatment history and anthropometric measurements including height, weight, waist circumference and blood pressure. The whole instrument has two modules with core and expanded questions. The questionnaire was translated to Malayalam and back translated to English by another person .It was found to be identical to the original questionnaire. The Malayalam version was pretested for validity.

2.8.2 Indian Health assessment questionnaire (Indian HAQ)[48]

Indian HAQ is comprised of 12 questions (nine basic and three advanced ADL, on the standard HAQ format) relevant to the Indian population. A Malayalam translation was done and back translated to English. The total score divided by 12 gave the Disability Index (range 0–3).A score " 0 " means, can do the activity without any difficulty,"1" indicates with some difficulty,"2 "indicates with much difficulty and "3 which indicates cannot do the activity.

2.9 DATA STORAGE

Data collected in the questionnaire was entered in Epi data masking the personal identifiers and it was stored in a personal laptop of the researcher which can only be accessed by the researcher. The questionnaires with the collected data are kept under lock and key.

2.10 DATA ANALYSIS

Data was entered in data and analyzed using Epi Info 3.3.2 and SPSS 15.0. Data was cleaned and the sample characteristics were analyzed in SPSS 15.0 and the prevalence of the noncommunicable disease risk factors were analyzed using Epi info 3.3.2.

2.11 ETHICAL CONSIDERATIONS

The study had obtained clearance from the Technical Advisory Committee and the Institute Ethical Committee of Sree Chithra Tirunal Institute for Medical Science and Technology, Thiruvananthapuram, Kerala prior to the data collection. Permission was obtained from the Community Advisory Board of the village which comprises of the panchayat president ,Vice president and the ward members.

Informed consent was obtained from each respondent before the interview.

Confidentiality and anonymity of the study participants were maintained.

The patients found to have the NCD risk factors was given health counseling and those who need further follow-up was referred to the outreach cardiology clinic of SCTIMST at CHC Vizhinjam in Athiyannur block.

Patients with severe disability with no intervention were referred to the PMR Department of Trivandrum Medical College

CHAPTER-3

RESULTS

This chapter focusses on the outcomes of data analysis in concordance with the objectives of the study. Data was entered in Epi data and analyzed using SPSS 15.0 and Epi Info 3.3.2 version.

The results of the study is presented in the following steps which includes

1) Sample characteristics: description of the sample, socio-demographic characteristics, grades of disability and causes of disability.

2) Prevalence of noncommunicable disease risk factors among the physically disabled,

3) Risk of developing noncommunicable disease among the physically disabled when compared to the age and sex matched comparison group.

4) Association of the sociodemographic factors with that of the total sample (N=250).

5) Multivariate analysis of the noncommunicable disease risk factors among the physically disabled when compared to the age and sex matched comparison group after adjusting for education, occupation and marital status

3.1 SAMPLE CHARACTERISTICS

A description of the study subjects are discussed under the following titles –Description of the study subjects in the Table 3.1.1 and the sociodemographic details in the table 3.1.2., grades of disability in Table 3.1.3 and causes of disability in Table 3.1.4

3.1.1 Description of the study subjects

Here both males and females are distributed in equal proportion across each age strata as age and sex matching was done between the disabled and comparison group. The mean age of the study population was 45.5 yrs.

Table 3.1.1. Description of the study subjects

Variable		Disabled(N=125) N (%)			Comparison group(N=125) N (%)			Total(N=250) N (%)
		Male N=72	Female N=53	Total N=125	Male N=72	Female N=53	Total N=125	
Age group	25- 34 years	18(51.4)	17(48.5)	35(100)	19(51.3))	18(48.6)	37(100)	72(28.8)
	35-44 years	12(50))	12(50)	24(100)	16(69.5)	7(30.4))	23(100)	47(18.8)
	45-54 years	25(80.6)	6(19.4)	31(100)	17(60.7)	11(39.3)	28(100)	59(23.6)
	55 -64 years	17(48.5)	18(51.4)	35(100)	20(54.1)	17(45.9)	37(100)	72(28.8)

Source: Primary Survey, 2008

3.1.2 SOCIODEMOGRAPHIC CHARACTERISTICS

Table 3.1.2 Sociodemographic characteristics

Socio demographic variable		**Disabled N (%) 125(100)**	**Comparison Group N(%) 125(100)**	**Chi-square p value**
Marital status	Living alone	52(41.6)	23(18.4)	0.00**
	Living with spouse	73(58.4)	102(81.6)	
	Total	125(100)	125(100)	
Educational status	Four years of schooling	66(52.8)	49(39.2)	0.03*
	More than four years of schooling	59(47.2)	76(60.8)	
	Total	125(100)	125(100)	
Occupational status	Employed	45(36)	75(60)	0.000**
	Unemployed	80(64)	50(40)	
	Total	125(100)	125(100)	

Source: Primary Survey , 2008 * p value significant at 0.05 level **p value significant at 0.01 level

Overall 41.6 percent of the disabled were living alone when compared to 18.4 percent living alone in the comparison group. Among the disabled living alone, 44.2 percent were males and 55.8 percent were females. Majority of the disabled (52.8 percent) had only four years of schooling while 60.8 percent of the comparison group had more than four years schooling. Only 36 percent of the physically disabled were employed when compared to 60 percent among the comparison group .About 60 percent of the employed disabled were unskilled land less laborers while only 30 percent were so among the comparison group.52.9 percent of the disabled females were unemployed when compared to 47.1 percent in the comparison group.

3.1.3 Grades of Disability

Table 3.1.3 Grades of Disability

Grade of disability	Men N (%) N=73	Women N (%) N=52	Total N=125
Mild (DI=0.01-1)	41(56.1)	17(32.7)	58(46.4)
Moderate (DI=1.01-2)	25(34.2)	30(57.7)	55(44.0)
Severe (DI=2.01-3)	7(9.6)	5(9.6)	12(9.6)

Source: Primary survey, 2008

Most of the disabled in the study were having mild to moderate disability.

3.1.4 Causes of Disability

It was found that 82.4 percent of the physically disabled were afflicted with polio in the early years, 8.8 percent became disabled following a fall or an accident, 6.4 percent were affected since birth and 2.4 percent had undergone amputation for Buerger's disease

3.2 Estimation of noncommunicable disease risk factor prevalence among the physically disabled (N=125)

The prevalence of the noncommunicable disease risk factors among the physically disabled was done in Epi Info 3.3.2 version.

Table 3.2 Prevalence of NCD risk factors among the physically disabled

Risk factor	**Prevalence (%)**	**95% CI**
Hypertension	43.2	34.4 -52.4
Tobacco	20.8	14.1 -29.0
Alcohol	15.0	6.9 -19.0
Lack of Physical inactivity	89.6	82.9 -94.3
High body mass index	33.6	25.4 -42.6
Self reported diabetes	12.0	6.9 -19.0
NCD high risk	39.2	30.6 -48.3

Primary survey,2008

Hypertension prevalence was found to be 44.4 percent among males and 41.5 percent among females.

Tobacco use which includes both smoking and smokeless tobacco was used only by males .Current smokers were 19.2 percent and smokeless tobacco was used by only 4.8 percent. About 31.2 percent of the tobacco users were employed, while among the unemployed, only 15 percent were current users.

Alcohol use which was found only among males had a prevalence of 12 percent. The amount of alcohol consumed were very high (more than 100grams of ethanol per day) for 60 percent of the current alcohol users, high (61-100 grams/day) for 26.7 percent and medium (41-60 grams /day) for 13.3 percent of the users. Majority (80 percent) of the alcohol consumers were employed, while among the alcohol abstainers 70 percent were unemployed.

Fruits and vegetable intake was found to be inadequate (less than five servings a day) for study and comparison group. Majority of the women (56.6 percent) consumed less than a fruit a day while 54.2 percent of men had at least one fruit a day. Most of the men and women consumed 2 to 4 servings of vegetable a day.

About 98.1 percent of the disabled women were physically inactive while among men physical inactivity was only 83.3 percent. Obesity (body mass index ≥25 kg/m2) was found to be high (45.3 percent) among females when compared to 25% among males. Majority (68.8 percent) of the disabled who were physically inactive were unemployed.

Prevalence of self reported diabetes was 6.9 percent among males and 18.9 percent among females. Presence of three or more risk factors was found to be more for females (45.3 percent) when compared to males (34.7 percent).

In conclusion, disabled females are found to have higher prevalence for Self reported Diabetes, lack of physical activity, low fruit intake and obesity than their male counterparts.

3.3) **RISK OF DEVELOPING NONCOMMUNICABLE DISEASE AMONG THE PHYSICALLY DISABLED WHEN COMPARED TO THE AGE AND SEX MATCHED COMPARISON GROUP**

Table 3.3.1 Outcome variable: Hypertension

	hypertension			
	Yes N (%)	No N (%)	Total N (%)	RR(95 % CI)
Disabled(N=125)	54(43.2)	71(56.8)	125(100)	1.32(1.04-1.69)*
Comparison group(N=125)	37(29.6)	88(70.4)	125(100)	

* p value significant at 0.05 level

Physically disabled were found to be having a risk ratio of 1.32(1.04-1.69) for developing hypertension when compared to the comparison group.

Table 3.3.2 Outcome variable :Tobacco

	Tobacco			
	Yes N (%)	No N (%)	Total N (%)	RR (95% CI)

Disabled(N=125)	26(20.8)	99(79.2)	125(100)	0.78(0.56-1.07)
Comparison group(N=125)	37(29.6)	88(70.4)	125(100)	

Physically disabled were found to be at lesser risk for consuming tobacco when compared to the age and sex matched comparison group but it was not statistically significant.

Table 3.3.3 Outcome variable: Alcohol

	Alcohol			
	Yes N (%)	No N (%)	Total N (%)	RR (95% CI)
Disabled(N=125)	15(12)	110(88)	125(100)	0.62(0.4-0.95)
Comparison group(N=125)	30(24)	95(76)	125(100)	

Physically disabled were not found to have alcohol consumption as a risk factor for developing noncommunicable disease when compared to the comparison group.

3.3 .4 Outcome variable: Inadequate fruits and vegetables

Fruit and vegetable intake was found to be inadequate among the both the physically disabled and the comparison group

Table 3.3.5 Outcome variable : Lack of physical activity

	Lack of physical activity			
	Yes N (%)	No N (%)	Total N (%)	RR (95% CI)
Disabled(N=125)	112(89.6)	13(10.4)	125(100)	5.01(2.54-9.89)**
Comparison group(N=125)	79(63.3)	46(36.8)	125(100)	

** p value significant at 0.01 level

Physically disabled were found to have a risk ratio of 5.01 when compared to the age and sex matched comparison group which was statistically significant

Table 3.3.6 Outcome variable: Obesity

	High Body mass index			
	Yes N (%)	No N (%)	Total N (%)	RR (95% CI)
Disabled	42(33.6)	83(66.4)	125(100)	1.11(0.86-1.44)
Comparison group	36(28.8)	89(71.2)	125(100)	

High Body mass index was not found to be a risk factor for the physically disabled when compared to the age and sex matched comparison group.

Table 3.3.7 Outcome variable: Self reported Diabetes

	Self reported Diabetes			
	Yes N (%)	No N (%)	Total N (%)	RR (95% CI)
Disabled(N=125)	15(12)	110(88)	125(100)	0.83(0.55-1.25)
Comparison group(N=125)	20(16)	105(84)	125(100)	

Self reported Diabetes was found to be slightly higher in the comparison group but this was not found to be statistically significant.

Table 3.3.8 Outcome variable: NCD High risk(≥ 3 risk factors)

	NCD high risk			
	Yes N (%)	No N (%)	Total N (%)	RR (95% CI)
Disabled (N=125)	49(39.2)	76(60.8)	125(100)	0.69(0.53-0.90)*
Comparison group (N=125)	71(56.8)	54(43.2)	125(100)	

*p value significant at 0.05 level

Physically disabled group was found to have lesser risk for three or more risk factors than the age and sex matched comparison group.

In a nut shell, physically disabled were found to have higher risk for hypertension and physical inactivity.

3.4 ASSOCIATION OF SOCIODEMOGRAPHIC FACTORS WITH THE NONCOMMUNICABLE DISEASE RISK FACTORS(N=250)

Disability was found to be associated with noncommunicable disease risk factors like lack of physical activity and hypertension through bivariate analysis done in the previous section. In this section the association of NCD risk factors with sociodemographic factors like education, employment status and marital status, which were not matched in the selection of comparison group, are being explored.

Bivariate analysis was done between each noncommunicable disease risk factor (Hypertension, Alcohol, Tobacco, Lack of physical inactivity, Self reported Diabetes, High body mass index) and sociodemographic variables like education, occupation and marital status.

3.4.1 .Outcome variable: Hypertension

It was found that the occupational status was associated with Hypertension with being unemployed as a risk for developing hypertension

Table 3.4.1

Sociodemographic factors		Hypertension			P value
		Yes N (%)	No N (%)	Total 250(100)	
Educational status	Four years of schooling	49(42.6)	66(57.4)	115(100)	0.06
	More than four years of schooling	42(31.1)	93(68.8)	135(100)	
Marital status	Living alone	22(29.3)	53(70.7)	75(100)	0.128
	Living with spouse	69(39.4)	106(60.6)	175(100)	
Occupation	Employed	31(25.8)	89(74.2)	120(100)	0.00**
	Unemployed	60(46.2)	70(53.8)	130(100)	

** p value significant at 0.01 level

3.4.2 Outcome variable: Tobacco

Marital status was found to be associated with tobacco consumption, and those living with spouse had a increased risk for tobacco consumption. Similarly employed people were found to have higher risk of tobacco use.

Table 3.4.2

Sociodemographic factors		Tobacco			P value
		Yes N (%)	No N (%)	Total 250(100)	
Educational status	Four years of schooling	33(28.7)	82(71.3)	115(100)	0.24
	More than four years of schooling	30(22.2)	105(77.7)	135(100)	
Marital status	Living alone	11(14.7)	64(85.3)	75(100)	0.01**
	Living with spouse	52(29.7)	123(70.3)	175(100)	
Occupation	Employed	46(38.3)	74(61.7)	120(100)	0.00**
	Unemployed	17(13.1)	113(86.9)	130(100)	

** p value significant at 0.01 level

3.4.3 .Outcome variable : Alcohol

Occupational status was found to be a predictor for the consumption of alcohol with higher prevalence among the employed. Other factors like educational status and marital status was not found to be statistically significant.

Table 3.4.3

Sociodemographic		Alcohol	P

factors		Yes N (%)	No N (%)	Total 250(100)	value
Educational status	Four years of schooling	16(13.9)	99(86.1)	115(100)	0.121
	More than four years of schooling	29(21.5)	106(78.5)	135(100)	
Marital status	Living alone	9(12)	66(88)	75(100)	0.10
	Living with spouse	36(20.6)	139(79.4)	175(100)	
Occupation	Employed	40(33.3)	80(66.7)	120(100)	0.00**
	Unemployed	5(3.8)	125(96.2)	130(100)	

3.4.4 Outcome variable: Lack of Physical activity

Unemployed were found to be physically inactive than the employed.

Table 3.4.4.

Sociodemographic factors		Physically inactive			P value
		Yes N (%)	No N (%)	Total 250(100)	
Educational status	Four years of schooling	22(19.1)	93(80.9)	115(100)	0.21
	More than four years of schooling	37(27.4)	98(72.6)	135(100)	
Marital status	Living alone	14(18.7)	61(81.3)	75(100)	0.22
	Living with spouse	45(25.7)	130(74.3)	175(100)	
Occupation	Employed	71(59.2)	49(40.8)	120(100)	0.00
	Unemployed	120(92.3)	10(7.7)	130(100)	

3.4.5 Outcome variable :Obesity (Body mass index ≥ 25 kg/m2)

Obesity was found to be associated with occupation with higher incidence in the unemployed group

Table 3.4.5

Sociodemographic factors		High body mass index			P value
		Yes N (%)	No N (%)	Total 250(100)	
Educational status	Four years of schooling	37(32.2)	78(67.8)	115(100)	0.75
	More than four years of schooling	41(30.4)	94(69.6)	135(100)	
Marital status	Living alone	22(29.3)	53(70.7)	75(100)	0.67
	Living with spouse	56(32)	119(68)	175(100)	
Occupation	Employed	29(24.2)	91(75.8)	120(100)	0.02**
	Unemployed	49(37.7)	81(62.3)	130(100)	

** p value significant at 0.05 level

3.4.6. Outcome variable : Self reported diabetes

Being unemployed was found to be a risk factor associated with Diabetes, which was statistically significant.

Table 3.4.6

Sociodemographic factors		Self reported diabetes			P value
		Yes N(%)	No N(%)	Total 250(100)	
Educational status	Four years of schooling	17(14.8)	98(85.2)	115(100)	0.742
	More than four years of schooling	18(13.3)	117(86.7)	135(100)	
Marital status	Living alone	9(12)	66(88)	75(100)	0.55
	Living with spouse	26(14.8)	149(85.1)	175(100)	
Occupation	Employed	11(9.2)	109(90.8)	120(100)	0.03**

	Unemployed	24(18.5)	106(81.5)	130(100)	

** Significant at 0.05 level

In conclusion marital status and occupational status were found to be a risk factor, other than disability by itself to develop noncommunicable disease risk factors.

3.5 MULTIVARIATE ANALYSIS OF THE NONCOMMUNICABLE DISEASE RISK FACTORS AMONG THE PHYSICALLY DISABLED WHEN COMPARED TO THE AGE AND SEX MATCHED COMPARISON GROUP AFTER ADJUSTING FOR EDUCATION,OCCUPATION AND MARITAL STATUS.

In this section, multiple logistic regression analysis is done to find the risk ratio of the outcome variables among the physically disabled after adjusting for education, occupation and marital status.

Risk factors	Unadjusted Risk ratio (95% CI)	Adjusted RR (95% CI)
Hypertension	1.32(1.04-1.69)*	1.76(1 -3.13)*
Alcohol	0.62(0.4-0.95)	0.67(0.32-1.41)

Tobacco	0.78(0.56-1.07)	0.9(0.4-1.7)
Physical inactivity	5.01(2.54-9.89)**	3.94(1.9-8.18)**
High body mass index	1.11(0.86-1.44)	1.14(0.64-2.04)
Self reported diabetes	0.83(0.55-0.9)	0.59(0.27-1.3)
NCD high risk(≥ 3 risk factors)	0.69(0.53-0.90)*	0.52(0.30-0.9)*

* p value significant at 0.05 level ** p value significant at 0.01 level

On adjusting for sociodemographic variables like education ,occupation and marital status ,which was independently found to be a risk factor other than disability, it was found that physically disabled are at higher risk of developing noncommunicable disease risk factors like lack of physical activity and hypertension than the age and sex matched comparison group.

CHAPTER 4

DISCUSSION AND CONCLUSION

4.1 DISCUSSION

The main objective of the study was to identify the profile of the noncommunicable disease risk factors among physically disabled and compare and contrast the prevalence of NCD risk factors with an age and sex matched comparison group.

4.1 Characteristics of the sample

According to the findings of the study, most of the physically disabled were disabled due to polio while some developed disability following an accident (Table 3.1.4).

Most of the physically disabled had only four years of schooling when compared to the age and sex matched comparison group where majority of them had education till the college level. This could be due to fewer opportunities for the disabled when compared to their counterparts. Those disabled with polio could have been affected in the early years of life which in turn would have affected their education.

Two thirds of the comparison group was employed when compared to only one third employed among the disabled. This could be due to limited mobility or due to decreased job opportunities. Considering the fact those majorities of the disabled in the study group were having only mild to moderate disability (table3.1.3), and that they could be employable, decreased employment rates could be due to less job opportunities for the disabled. Another striking feature is that among the disabled that were employed, a good proportion of them were working as unskilled laborers. This could predispose them to poorer financial status. Most of the disabled females were unemployed serving as homemakers with no financial incentives.

This finding is in concordance with other study findings of reduced employment and socioeconomically marginalized status of the disabled.[20]

The proportion remaining unmarried in the disabled group were double than that among the comparison group. It is also found that more women bear the brunt of being unmarried due to disability compared to men. This point out the stigma and disadvantage of women with disability in the community.

4.2 Profile of noncommunicable disease risk factor

Here the profile of noncommunicable disease risk factor of the disabled and a comparison with the age and sex matched comparison group is being discussed.

4.2.1 Hypertension

Among the disabled (Table 3.2)

The prevalence of hypertension was found to be more or less same between the disabled males (44.4 percent) and females (41.5 percent) which predispose both of them to develop noncommunicable diseases. This finding is very high when compared to a study done by Thankappan et al where the hypertension prevalence of the general population of the same area was 1.5 percent and 16.6 percent among males and females respectively. [10]Various other studies suggest that increased blood pressure can lead to stroke related disability [15], but no study has focussed on the hypertension prevalence among the disabled whose disability status was not related to increased hypertension.

Comparison between the disabled and the age and sex matched comparison group (Table 3.3.1)

The prevalence of hypertension was 43.2 percent among the disabled while in the age and sex matched comparison group it was only 29.6 percent. The physically disabled were found to have a risk ratio of 1.32(1.04-1.69).

In several studies it was explored that hypertension leads to stroke related disability .[15] But less effort was made to find out whether the physical disability by other causes were having a higher prevalence of other NCD risk factors..

4.2.2. Tobacco use

Among the disabled (Table 3.2)

Tobacco use which includes both smoking and smokeless tobacco was used only by males. Uses of tobacco among women were not found as is not a social norm. The current smoking prevalence was 19.2 percent while smokeless tobacco was only 7.2 percent. Chewing tobacco was the most common form of smokeless tobacco usage while manufactured cigarettes and beedi were commonly used for smoking. This is different from that of general population where the prevalence of smoking among males were 32 percent and smokeless tobacco was 15 percent.[10] Such a lower consumption among the disabled could be due to financial constraints as evidenced by the lesser proportion of current smokers among the unemployed(15 percent).

Comparison with the age and sex matched comparison group (Table 3.3.2)

In general Tobacco use was found to be high in the study subjects with more users in the comparison group. This was quite surprising as other published studies state that he disabled are at a higher risk of consuming tobacco products.

A study by Centre for disease Control, United states reveals that the smoking prevalence among the disabled is 50 times higher than the non-disabled. [39]

This difference in the finding might be due compromised own financial disposition of disabled in the Indian scenario, unlike western countries where government insurance (Medicaid) take care of that aspect. . The observation that majority of the tobacco abstainers remain unemployed validates the differences in the finding.

It was found that 68.2 percent of the tobacco abstainers among the disabled were unemployed, while only 51 percent of the abstainers in the comparison group were unemployed.

4.2.3 Alcohol use

Among the disabled (Table 3.2)

Alcohol consumption was found only among males and has a prevalence of 12 percent. This finding is quite different from that of a study done by Thurer and Rogers (1984) which estimates that 53 percent of the physically impaired people depended on alcohol. [43-44] The reduced number of alcohol users in my study population could be due to limited employment opportunities for them, which compromises their ability to purchase alcohol. . This assumption is validated by the finding that 70 percent of the alcohol abstainers were

unemployed. However it is alarming to note that majority of alcohol uses among disabled are heavy drinkers..

When the amount of alcohol consumed was analyzed, it was found that 60 percent of the current alcohol users among the disabled consumed very large amounts (more than 100 grams/day).None of them had consumed alcohol at optimum level which is 30 grams of ethanol a day.

Comparison with the age and sex matched comparison group (Table 3.3.3)

Alcohol prevalence was found to be high among the comparison group (24 percent) when compared to 12 percent among the disabled. In both the groups, only males consumed alcohol and the amount of alcohol consumed was very high (100 grams of ethanol /day) for about 60 percent of current alcohol users among the disabled and 58.1 percent among the comparison group. The prevalence noticed in this study less than the study of Thankappan et al, 2007, where the current alcohol prevalence was 41.6 percent; which could be due to underreporting .[42]

In this study the physically disabled were not found to have a higher risk of consuming alcohol than the comparison group.

Another finding is that 70 percent of the alcohol abstainers among the physically disabled were unemployed, while among the comparison group, only 50 percent of the alcohol abstainers were unemployed. Employment status was found to predict the alcohol consumption which reveals the financial independence is an important factor. Probably , it explains the reason for reduced prevalence of alcohol consumption among the physically disabled unlike in studies from western countries

4.2.4. Fruit and vegetable intake

Among the disabled

Fruits and vegetable intake was found to be inadequate (less than five servings a day) for the disabled group in general and more so among women. Majority of the women (56.6 percent) consumed less than a fruit a day while 54.2 percent of men had at least one fruit a day. Most of the men and women consumed 2 to 4 servings of vegetable a day. Fruits are generally not purchased at homes. However, males are found to consume at least a fruit a day and the explanation is that they mostly consume at least a banana a day at the local tea shop. Females generally do not go to local tea shops. When compared to the study done on general population (Thankappan et al, 2008), similar findings were found , where majority had one fruit and 2-4 servings of vegetable a day

Comparison with the age and sex matched comparison group. Fruit and vegetable intake was inadequate in both disabled and comparison group .The number of servings of fruit consumed per day was one for majority of them in both disabled and comparison group, with females having less than a fruit a day. The effect of gender may be the possible explanation for that reduced consumption of fruits by females. The number of serving of vegetable was two to four for both the disabled and comparison group.

4.2.5 Lack of physical activity (Table 3.2)

Among the disabled

Almost all disabled women (98 percent) were physically inactive compared to only 83.3 percent of men. Similarly obesity was found to be prevailing among disabled women (45.3 percent) than men (25 percent).The reason for this increased risk among women may be due to

their confinement at home and poor employment status. A similar finding of increased obesity and physical inactivity among women than men was found in the western countries.[49]

Comparison with the age and sex matched comparison group (Table 3.3.5)

About 89.6 percent of the physically disabled were inactive when compared to only 63.2 percent inactive in the comparison group. It was also found that 68.3 percent of the inactive disabled were unemployed when compared to only 54 percent among the comparison group. Thus unemployment was correlated to physical inactivity. Physically disabled had a risk ratio of 5.01(2.54-9.89) for physical inactivity than the comparison group.

Similar trends were reported in several studies where the disabled are at higher risk of physical inactivity than the non- disabled.[38,42] Studies have also measured the physical activity level and found that the activity were of lower intensity and frequency.

4.2.6 Self reported Diabetes

Among the disabled

Self reported diabetes was found higher among females (18.9 percent when compared to males with only 6.9 percent. This finding suggests a higher prevalence among the disabled when compared to a study by Mohan et al in the rural population with a prevalence of 3.1 percent.[45]

Comparison with the age and sex matched comparison. Table 3.3.7

Self reported diabetes was 12 percent for the physically disabled when compared to 16 percent in the comparison group The findings in the comparison group is similar to a study by Kutty et al where the prevalence was 17 percent in rural Kerala (11)

In conclusion the physically disabled were found to be at risk for lack of physical activity and hypertension .Other than disability as a risk factor for developing noncommunicable diseases risk, it was intended to find out whether sociodemographic variables like marital, education and occupational status were associated with noncommunicable diseases .It was done by doing bivariate analysis with each of the risk factor and these sociodemographic variables. Occupational and educational status was found to be predictors for noncommunicable disease risk factors. So multivariate logistic regression was done adjusting for marital status, occupation and educational status to find whether physical disability was a risk factor for developing noncommunicable diseases.

4.3 MULTIVARIATE LOGISTIC REGRESSION ANALYSIS

On doing multivariate logistic regression adjusting for sociodemographic variables it was found that physical disability was a major risk factor for developing hypertension with an adjusted risk ratio of 3.94(1.9-8.18)..Similarly the physically disabled were at higher risk for hypertension with a risk ratio of 1.76 (1 - 3.13) . The risk for all other risk factors were not statistically significant.

Regular physical activity or exercise is known to provide health and fitness benefits (muscular strength, cardio respiratory and muscular endurance, flexibility, reduced body fat, improved

physical function, and decreased depression and anxiety), decrease the risk of chronic conditions (coronary heart disease, diabetes, obesity, hypertension, stroke, colorectal cancer, breast cancer, and osteoporosis.

Thus physical disability poses a great risk in developing hypertension and physical inactivity.

4.4 STRENGTHS OF THE STUDY

- To our knowledge there is limited published literature that have analyzed whether the physical disabled are at risk of developing noncommunicable diseases. Hence it is an initial attempt made and unique study among the disabled
- The investigator herself collected the data and took measurement for the study population, hence interobserver variability is minimized.
- Age and sex confounding was eliminated by taking the age and sex matched comparison group.

4.5 LIMITATIONS OF THE STUDY

- This study is limited to physically disabled, but given that the physically disabled constitute 52 percent of the disabled population, this study is representing the disabled.
- Noncommunicable disease risk factors could not be studied across the different grades of disability due to inadequate samples in each group. Hence the dose –response effect could not be studied.

4.6 CONCLUSION AND RECCOMMENDATIONS.

Disability was found to be associated with hypertension and lesser physical activity after adjusting for age and sex by matched selection during data collection and adjusting for education ,employment and marital status during data analysis in multiple logistic regression. As majority of the disabled had acquired disability in the early years of life due to polio, and disability for a minimum period of 5 years was the criteria for sample selection disability could be considered as a risk factor for noncommunicable diseases.

After adjusting for other variables, disabled were found to have a higher risk of developing hypertension and lack of physical activity.

When compared to the other studies that look into development of disability following noncommunicable diseases, this study throws light on the risk that the disabled are exposed. To reinstate causal association, a prospective cohort study is recommended.

The findings of the study also revealed the increased risk faced by the disabled women due to social stigma within the community.

In the present decade of increased incidence of disability due to road traffic accidents, war and violence, it is important to identify the risks that the disabled are exposed to. To address the epidemic of noncommunicable diseases, strategies focussing on the population (mass strategies) as well as the high risk approach are very much required. Government should take the initiative for the development and implementation of a well grounded risk factor control program to address these risk.[50]

As one of the strategies of the pilot phase of National Programme for Prevention and Control of Diabetes, Cardiovascular Diseases and Stroke (NPDCS) is to target the high risk group ,it is important to identify the risk factors to NCDS.

As the prevalence of certain risk factors like alcohol, tobacco. Inadequate intake of fruits and vegetables were high, strategies can be addressed to the population as whole. Physically disabled could be screened for hypertension for early identification and rehabilitation. Moreover, ”disabled specific” interventions have to be made to address the risk of physical inactivity.

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Appendix 1 INFORMED CONSENT

ACHUTHA MENON CENTRE FOR HEALTH SCIENCE STUDIES,
SREE CHITHRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY.

Good morning, I am Elezebeth Mathews, currently doing Masters in Public health at Sree Chithra Tirunal Institute of Medical Science and Technology. I am doing a study on "Noncommunicable disease risk factors among the physically disabled" as a part of my study requirement. The objective of the study is to find out the profile of the noncommunicable disease risk factor among the physically disabled and the correlates.
I would like to ask you about your health behaviour with regard to smoking, alcohol consumption, dietary intake, and physical activity I will also take measurements like height, weight, waist circumference to calculate BMI.The whole procedure will take about 1 hour. There may be no direct benefit to you from the study but the information collected from you may help others
in the community as a whole. There is no harm to you in participating the study. The information give by you will be kept confidential and will be used for research purpose only. However participation in the study is purely voluntary. You may choose not to participate in the study if you don't want to. You may also withdraw from the study at any time after joining.

Please tick your response

Yes, I am willing to participate in the above-mentioned study.

No, I am not willing to participate in the above-mentioned study

Signature of the participant_____
Date_____
Signature of the proxy respondent)_____
(Only if participant is unable to do)
Date_____

In case of any queries, you may contact:
Mrs Elezebeth Mathews,
MPH-07,
Sree Chitra Tirunal Institute of Medical Sciences and Technology,
Thiruvananthapuram,
Phone no:9846361156
OR
Dr.Anoop Kumar Thekkeveetil
Member Secretary, Institutional Ethics Committee
Sree Chitra Tirunal Institute of Medical Sciences and Technology
Thiruvananthapuram
Phone no: 0471-2520256

Appendix 2

സമ്മതപത്രം

അച്ചുതമേനോൻ സെന്റർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസ്,
ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ് ആന്റ് ടെക്നോളജി.

നമസ്കാരം,

ഞാൻ എലിസബത്ത് മാത്യൂസ് ഇപ്പോൾ ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസ് ആന്റ് ടെക്നോളജിയിൽ പൊതുജന ആരോഗ്യത്തിൽ ഉപരി പഠനം നടത്തുന്ന വിദ്യാർത്ഥിനിയാകുന്നു. എന്റെ പഠനത്തിന്റെ ഭാഗമായി ഞാൻ ഒരു സ്റ്റഡി നടത്തുന്നു (അതായത് ശാരീരിക അംഗവൈകല്യമുള്ളവർക്ക് ഹൃദയസംബന്ധമായ രോഗങ്ങൾ, ഡയബറ്റീസ് എന്നിവ വരാനുള്ള സാദ്ധ്യതയെ കുറിച്ച് ആണ്. ഈ സ്റ്റഡിയുടെ ലക്ഷ്യം ശാരീരിക അംഗവൈകല്യമുള്ളവരിൽ ഹൃദയസംബന്ധമായ രോഗങ്ങൾ, ഡയബറ്റീസ് എന്നിവയുടെ നിലവാരവും, സംബന്ധമായ കാരണങ്ങളേയും കുറിച്ചു പഠിക്കുക എന്നതാണ്. അതിനായി ഞാൻ താങ്കളോട് ആരോഗ്യ സംബന്ധമായ ശീലങ്ങളെ (ഉദാ: പുകയില ഉപയോഗം, മദ്യപാനം, ആഹാരരീതി, ശാരീരിക അദ്ധ്വാനം) ക്കുറിച്ച് ചോദിക്കുന്നതാണ്. ഉയരം, ശരീരഭാരം, അരക്കെട്ട് അളവ് എന്നിവ ഇതിനായി എടുക്കുന്നതാണ്. ഇതിനെല്ലാം ശരാശരി ഒരു മണിക്കൂർ സമയമെടുക്കും. ഈ സ്റ്റഡിയിലൂടെ താങ്കൾക്ക് നേരിട്ട് ഉപയോഗപ്പെടുകയില്ലെങ്കിലും, സമൂഹത്തിന് ഉപകാരപ്പെട്ടേക്കാം. ഈ സ്റ്റഡിയിൽ പങ്കെടുക്കുന്നതുമൂലം താങ്കൾക്ക് നേരിട്ട് ഉപദ്രവം ഒന്നും തന്നെ വരുന്നില്ല. താങ്കൾ തരുന്ന വിവരങ്ങൾ തികച്ചും രഹസ്യവും, പഠനത്തിന് മാത്രമായി ഉപയോഗിക്കുന്നതാണ്.

ഈ സ്റ്റഡിയിൽ താങ്കൾ പങ്കെടുക്കുന്നത് തികച്ചും താങ്കളുടെ ഇഷ്ടത്താലാണ്. പങ്കെടുക്കുവാൻ താല്പര്യപ്പെടാതെയും ഇരിക്കാം. സ്റ്റഡിയിൽ ചേർന്നതിൽ പിന്നെ എപ്പോൾ വേണമെങ്കിലും താങ്കൾക്ക് സ്റ്റഡിയിൽ നിന്ന് പിൻമാറാം.

ദയവായി താങ്കളുടെ മറുപടി ടിക്ക് ചെയ്യുക

മേൽപ്പറഞ്ഞ സ്റ്റഡിയിൽ പങ്കെടുക്കുവാൻ എനിക്ക് സമ്മതമാണ്

മേൽപ്പറഞ്ഞ സ്റ്റഡിയിൽ പങ്കെടുക്കുവാൻ എനിക്ക് സമ്മതമല്ല

പങ്കെടുക്കുന്ന വ്യക്തിയുടെ ഒപ്പ്/കൈപ്പതിപ്പ് .....
തീയതി .....

പങ്കെടുക്കുന്ന വ്യക്തിക്ക് പകരം പ്രതികരിക്കുന്ന
ആളുടെ ഒപ്പ്/ കൈപ്പതിപ്പ് .....
തീയതി .....

കൂടുതൽ വിവരങ്ങൾക്ക് :

എലിസബത്ത് മാത്യൂസ്,
MPH-07,
അച്ചുതമേനോൻ സെന്റർ ഫോർ ഹെൽത്ത് സയൻസ് സ്റ്റഡീസ്,
OR
ഡോ. അനൂപ് കുമാർ തെക്കേവീട്ടിൽ,
മെംബർ സെക്രട്ടറി,
ഇൻസ്റ്റിറ്റ്യൂഷണൽ എത്തിക്സ് കമ്മിറ്റി
ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ

മെഡിക്കൽ സയൻസസ് ആന്റ് ടെക്നോളജി,
തിരുവനന്തപുരം

ഫോൺ നമ്പർ : 0471-2520256

or

ശ്രീ ചിത്ര തിരുനാൾ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഫോർ മെഡിക്കൽ സയൻസസ് ആന്റ് ടെക്നോളജി,

ഫോൺ നമ്പർ :9846361156ഡ

Appendix 3

Respondent ID No: **Case** ☐

Comparison group ☐

IDENTIFICATION INFORMATION

INTRODUCTION

Good morning
My name is ---------- and I have come to get some information from you, on your health problems and some diseases as a part of a study. The information that you give will be kept confidential.

code	Variable	Options for entry	Response
1	Ward Name		
2	House number		
3	Date of interview		☐☐/☐☐/☐☐☐☐ Day / month / year
4	Consent has been read out and obtained from to the respondent.	Yes—1 No---2	☐
5	Name (Family First)		_____
6	Complete residential address		_____ _____ _____
7	Contact phone number	Area code/phone no	_____/_____
If the respondent is not the patient(unable to speak),then go to 8,else C1			
8	Age of the proxy respondent	Age in completed years	☐☐yrs
9	Sex(Record as observed)	Male -1 Female-2	☐
10	What is your relationship with the patient?	Spouse-1 Father-2 Mother-3 Sibling-4 Friend-5	☐

		Son-6 Daughter-7	

DEMOGRAPHIC INFORMATION

Code	Question	Options for entry	Response
C1	Sex (*Record Male / Female as observed*)	Male -1 Female-2	☐
C2	What is your date of birth? *If Don't Know, See Note* below and Go to C3*		☐☐/☐☐/☐☐☐☐ Day / Month / Year
C3	How old are you?	In completed years	☐☐yrs
C4	What is the highest level of education you have completed?	No formal schooling=01 Less than primary school=02 Primary school completed=03 Secondary school completed=04 High school completed=05 College/university completed=06 Postgraduate=07	☐☐
C5	Which of the following best describes your <u>main</u> work status over the last 12 months?	Professional/executive/Big Business=01 Clerical/medium business=02 Self employed/skilled=03 Unskilled/landless laborer=04 Student=05 Homemaker=06	☐☐

		Retired=07 Unemployed(able to work)=08 Unemployed(unable towork)=09	
C6	What is your current marital status?(***SELECT THE SINGLE BEST OPTION)***	Never married -01 Currently married -02 Separated-03 Divorced -04 Widowed-05 Cohabiting-06	☐☐
C7	In which year was the onset of this condition?	Year of disability onset	☐☐☐☐

STEP 1-CORE BEHAVIOURAL MEASURES

TOBACCO USE (Section T)

Now I am going to ask you some questions about various health behaviors. This includes things like smoking, drinking alcohol, eating fruits and vegetables and physical activity. Let's start with smoking.

Code	Question	Options	Response
T1a	Do you currently smoke any **tobacco products**, such as cigarettes, beedi, ghutka, cigars?	Yes-1 No-2	☐ If no, go to A1a If yes, go to T1b
T1b	Do you currently smoke tobacco products **daily**	Yes-1 No-2	☐
T2a	How old were you when you **first started** smoking daily?	Age in years	☐☐
T2b	Do you remember how long ago it was?	In years or In month	In years ☐☐

		Or In weeks	In months ☐☐ In weeks ☐☐
T3	On average, **how many** of the following do you smoke each day? (Record for each type)	Manufactured cigarettes Beedi Pipes full of tobacco/hooka/chillum Cigars Others (specify) _____	☐☐ ☐☐ ☐☐ ☐☐ ☐☐
T4a	Do you currently use any smokeless tobacco such as [snuff, chewing tobacco, betel, ghutka, khaini, or other] ?	Yes 1 No 2	☐ If no, go to A1a If yes, go toT4b
T4b	Do you **currently use smokeless tobacco** products **daily?**	Yes 1 No 2	☐ If no, go to A1a If yes, go to T5
T5	On average, how many **times a day** do you use …. *(RECORD FOR EACH TYPE)*	Snuff Ghutka Khaini Chewing tobacco Betel Others(specify)_____	☐☐ ☐☐ ☐☐ ☐☐ ☐☐ ☐☐

Code: Don’t remember as 77, don’t know as 88 and not applicable as 99

ALCOHOL CONSUMPTION (SECTION A)

Now I will ask about alcohol consumption.

Code	Questions	Options	Response
A1a	Have you **ever consumed** a drink that contains alcohol such as beer, whisky, rum, gin, brandy, or other local products?	Yes 1 No 2	☐ If yes ,go to A1b If no, go to D1
A1b	Have you consumed alcohol within the **past 12 months**?	Yes 1 No 2	☐
A2	In the past 12 months, **how frequently** have you had at least one drink? *(READ RESPONSES)*	5 or more days a week=1 1-4 days per week=2 1-3 days a month=3 Less than once a month=4	☐
A3	When you drink alcohol, **on average**, how many drinks do you have during one day?	Number	☐☐
A4	During each of the **past 7 days**, how many standard drinks of any alcoholic drink did you have each day? **Standard bottle of various alcoholic drinks** Regular beer=285ml Single measure of spirit=30ml Medium glass of wine=120ml 1 measure of aperitif=60ml *(RECORD FOR EACH DAY)*	Monday Tuesday Wednesday Thursday Friday Saturday Sunday	☐☐ ☐☐ ☐☐ ☐☐ ☐☐ ☐☐ ☐☐

Code: Don't remember as 77, don't know as 88 and not applicable as 99

DIET (SECTION D)

The next questions ask about the fruits, vegetables and non- vegetarian food. I have a nutrition card here that shows you some examples of local fruits and vegetables. Each picture represents the size of a serving. As you answer these questions please think of a typical week in the last year.

Code	Question	Options	Response
D1a	In a typical week, how many days do you **eat fruit**?	Number of days	☐ If 0 days ,go to D2a
D1b	How many **servings** of fruit do you eat on **one** of those days?	Number of servings	☐
D2a	In a typical week, how many days do you **eat vegetables**?	Number of days	☐ If 0 days ,go to D3
D2b	How many **servings** of vegetables do you eat on one of those days?	Number of servings	☐
D3	What type of **oil or fat is most often** used for meal preparation in your household? *SELECT ONLY ONE*	Vegetable oil (refined/unhydrogenated)=01 Vegetable oil(hydrogenated)=02 Butter or ghee=03 Other(specify)_____=04 None in particular=05 Coconut oil=06	☐☐

Code: Don't remember as 77, don't know as 88 and not applicable as 99

PHYSICAL ACTIVITY (SECTION P)

Next I am going to ask you about the time you spend doing different types of physical activity. Please answer these questions even if you do not consider yourself to be an active person. Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, household chores, harvesting food, fishing or hunting for food, seeking employment. *[Insert other examples if needed]*

Code	Questions	Options	Response

P1	Does your work involve mostly sitting or standing, with walking for no more than 10 minutes at a time?	Yes-1 No-2	☐ If yes,goto P6
P2	Does your work involve vigorous activity, like [*heavy lifting, digging or other work*] for at least 10 minutes at a time? *INSERT EXAMPLES*	Yes-1 No-2	☐ If no, go to P4
P3a	In a typical week, how many days do you do vigorous activities as part of your work?	Days per week	☐☐
P3b	On a typical day on which you do vigorous activity, how much time do you spend doing such work?	In hours and minutes Or In minutes	☐☐:☐☐ hrs: mts ☐☐☐
P4	Does your work involve moderate-intensity activity, like brisk walking *[or carrying light loads*] for at least 10 minutes at a time? *INSERT EXAMPLES*	Yes-1 No-2	☐ If no go to P6 If yes, go to P5a
P5a	In a typical week, on how many days do you do moderate-intensity activities as part of your work?	Days per week	☐
P5b	On a typical day on which you did moderate-intensity activities, how much time do you spend doing such work?	In hours Or In minutes	☐☐:☐☐ hrs: mts ☐☐☐mts
P6	How long is your typical workday?	Number of hours	☐☐hrs

Other than the activities that you have mentioned, I want to ask you how you travel from one place to another like from home to work place, shopping etc

P7a	Do you walk or use a bicycle (*pedal cycle*) for at least 10 minutes continuously to get to and from places?	Yes-1 No-2	☐
P7b	How do you travel from one place to another	Specify	_____
P8a	In a typical week, on how many days do you walk or bicycle for at least 10 minutes to get to and from places?	Days a week	☐
P8b	How much time would you spend walking or bicycling for travel on a typical day?	In hours Or In minutes	☐☐:☐☐ hrs: mts ☐☐☐mts

Code: Don't remember as 77, don't know as 88 and not applicable as 99

Next I am going to ask about your activities during leisure time. Think about your activities during leisure time and not during work or traveling that you have mentioned already.

Code	Questions	Options	Response
P9	Does your [*recreation, sport or leisure time*] involve mostly sitting, reclining, or standing, with no physical activity lasting more than 10 minutes at a time?	Yes-1 No-2	☐ If yes, go to P14 If no, go to P10
P10	In your [*leisure time*], do you do any vigorous activities like [*running or strenuous sports, weight lifting*] for at least 10 minutes at a time?	Yes-1 No-2	☐
P11a	In a typical week, on how many days do you do vigorous activities as part of your [*leisure time*]?	Number of days	☐

P11b	How much time do you spend doing this on a typical day?	In hours or In minutes	☐☐:☐☐ hrs: mts ☐☐☐mts
P12	In your [*leisure time*], do you do any moderate-intensity activities like brisk walking,[*cycling or swimming*] for at least 10 minutes at a time? *INSERT EXAMPLES*	Yes-1 No-2	☐ If yes, go to P13a If no, go to P14
P13a	In a typical week, on how many days do you do moderate-intensity activities as part of [*leisure time*]?	Number of days	☐
P13b	How much time do you spend doing this on a typical day?	In hours Or In minutes	☐☐:☐☐ hrs: mts ☐☐☐mts

Code: Don't remember as 77, don't know as 88 and not applicable as 99

The following question is about sitting or reclining. Think back over the past 7 days, to time spent at work, at home, in *[leisure]*, including time spent sitting at a desk, visiting friends, reading, or watching television, but do not include time spent sleeping.

P14	Over the past 7 days, how much time did you spend sitting or reclining on a typical day?	In hours Or In minutes	☐☐:☐☐ hrs: mts ☐☐☐mts

TREATMENT HISTORY (SECTION H)

The following questions are for the treatment received in the past 12 months for

Code	Questions	Options	Response
H1	When was your blood pressure last measured by a health professional?	Within past 12 months-1 1-5 years ago-2 Not within past 5 yrs-3	☐
H2	During the past 12 months have you been told by a doctor or other health worker that you have elevated blood pressure or hypertension?	Yes-1 No-2	☐
H3	Are you currently receiving any treatment for high blood pressure prescribed by a doctor or other health worker?	Yes-1 No-2	☐
H4	Have you had your blood sugar measured in the last 12 months?	Yes-1 No-2	☐
H5	Have you ever been told by a doctor or other health worker that you have diabetes?	Yes-1 No-2	☐
H6	Are you currently receiving any treatment for diabetes prescribed by a doctor or other health worker?	Yes-1 No-2	☐

STEP 2 PHYSICAL MEASUREMENTS

Code	Measurement	Findings
M1	Height	☐☐☐.☐ cms
M2	Weight	☐☐☐.☐kgs
M3	Waist circumference	☐☐☐.☐cms
M4	Cuff size used small-1 Normal-2 Large-3	☐
M4	Reading 1 systolic BP Diastolic BP	☐☐☐

		(mm of Hg)	☐☐☐
M5	Reading 2	systolic BP Diastolic BP (mm of Hg)	☐☐☐ ☐☐☐
M6	Reading 3	systolic BP Diastolic BP (mm of Hg)	☐☐☐ ☐☐☐

DISABILITY ASSESSMENT

(Adapted from Indian health assessment questionnaire)

The Indian HAQ

	Activity of daily living (ADL): Are you able to:	**Without any difficulty (0)**	**With some difficulty (1)**	**With much difficulty (2)**	**Unable to do (3)**
1.	Dress yourself, including tying sari/salwar/dhoti/pyjama and doing buttons?	☐	☐	☐	☐
2.	Get in and out of bed?	☐	☐	☐	☐
3.	Lift a full cup or glass to your mouth?	☐	☐	☐	☐
4.	Walk outdoors on flat ground?	☐	☐	☐	☐
5.	Wash and dry your entire body?	☐	☐	☐	☐
6.	Squat in the toilet or sit cross-legged on the floor?	☐	☐	☐	☐
7.	Bend down to pick up clothing from the floor?	☐	☐	☐	☐
8.	Turn a tap on and off?	☐	☐	☐	☐
9.	Get in and out of auto rickshaw/manual rickshaw/car?	☐	☐	☐	☐
10.	Walk three kilometers?	☐	☐	☐	☐

11.	Shop in a vegetable market?	☐	☐	☐	☐
12.	Climb a flight of stairs?	☐	☐	☐	☐

$$\text{Disability Index} \frac{\text{Sum of all scores}}{12}.$$

APPENDIX 4

Respondent ID No: **Case** ☐

Comparison group ☐

തിരിച്ചറിയൽ വിവരങ്ങൾ

ആമുഖം

പ്രിയ സുഹൃത്തേ,
ഞാൻ എലിസബത്ത് മാത്യൂ, ശ്രീ ചിത്രയിലെ ഒരു വിദ്യാർത്ഥിനിയാകുന്നു. എന്റെ പഠനത്തിന്റെ ഭാഗമായി ഞാൻ ഒരു സ്റ്റഡി നടത്തുന്നു. അതിനുവേ 1 താങ്കളുടെ പക്കൽ നിന്നും ആരോഗ്യ സംബന്ധമായ ചില വിവരങ്ങൾ ശേഖരിക്കുവാൻ വന്നിരിക്കുകയാണ്. നിങ്ങൾ തരുന്ന വിവരങ്ങൾ വളരെ രഹസ്യമായി സൂക്ഷിക്കുന്നതാണ്. താങ്കളുടെ സഹകരണം ഞാൻ പ്രതീക്ഷിക്കുന്നു.

code	Variable	Options for entry	Response
1	വാർഡ് പേര്		
2	വീട്ട് നമ്പർ		
3	അഭിമുഖം ചെയ്ത ദിവസം		☐☐/☐☐/☐☐☐☐ ദിവസം / മാസം / വർഷം
4	സമ്മതപത്രം വായിച്ചു, കേൾപ്പിച്ചു, ലഭിച്ചുവോ	Yes—1 No---2	☐
5	പേര് (കുടുംബപേര് ആദ്യം)		_____
6	പൂർണ്ണമായ മേൽ വിലാസം		_____ _____ _____
7	ടെലിഫോൺ നമ്പർ	Area code/phone no	_____/_____
പ്രതികരിക്കുന്ന വ്യക്തി പേഷ്യന്റ് അല്ലായെങ്കിൽ 8-ാം ചോദ്യത്തിലേക്ക് പോകുക അല്ലെങ്കിൽ C1			
8	പ്രതികരിക്കുന്ന വ്യക്തിയുടെ വയസ്സ്	പൂർത്തിയാക്കിയ വയസ്സ് (Age in completed years)	☐☐yrs
9	ലിംഗം (പുരുഷൻ/സ്ത്രീ)	Male -1 Female-2	☐

10	താങ്കൾക്ക് രോഗിയുമാ യുള്ള ബന്ധം എന്താണ്?	ഭർത്താവ്/ഭാര്യ-1 പിതാവ്-2 മാതാവ്-3 സഹോദരി/സഹോ ദരൻ-4 സുഹൃത്ത്-5 മകൻ-6 മകൾ-7	☐

വ്യക്തിഗത വിവരങ്ങൾ

Code	Question	Options for entry	Response
C1	ലിംഗം (പുരുഷൻ/സ്ത്രീ)	Male -1 Female-2	☐
C2	ജനനതീയതി		☐☐/☐☐/☐☐☐☐ Day / Month / Year
C3	വയസ്സ്	പൂർത്തിയാക്കിയ വയസ്സ് (In completed years)	☐☐yrs
C4	ഉയർന്ന വിദ്യാഭ്യാസ യോഗ്യത?	അടിസ്ഥാന വിദ്യാഭ്യാസം ഇല്ല (No formal schooling)=01 പ്രൈമറി സ്കൂളിനു താഴെ (Less than primary school)=02 പ്രൈമറി സ്കൂൾ പൂർത്തീക രിച്ചു (Primary school completed)=03 സെക്കൻ റി സ്കൂൾ പൂർത്തികരിച്ചു (Secondary school completed)=04 ഹൈസ്കൂൾ പൂർത്തീകരിച്ചു (High school completed)=05 ബിരുദം പൂർത്തീകരിച്ചു (College/university completed)=06 ബിരുദാനന്തരബിരുദം പൂർത്തീകരിച്ചു (Postgraduate)=07	☐☐
C5	കഴിഞ്ഞ ഒരു വർഷം നിങ്ങളുടെ	പ്രൊഫഷണൽ/ വലിയ ബിസിനസ്സ്	

	പ്രധാന തൊഴിൽ എന്തായിരുന്നു?	(Professional/executive/Big Business)=01 ക്ലർക്ക്/ചെറിയ ബിസിനസ്സ് (Clerical/medium business)=02 സ്വയം തൊഴിൽ/കൈത്തൊഴിൽ (Self employed/skilled)=03 ഭൂമിയില്ലാത്ത തൊഴിലാളി (Unskilled/landless laborer)=04 വിദ്യാർത്ഥി (Student)=05 വീട്ടുജോലി (Homemaker)=06 റിട്ടയേർഡ് (Retired)=07 തൊഴിൽ രഹിതൻ(ജോലി ചെയ്യുവാൻ കഴിയും) Unemployed(able to work)=08 തൊഴിൽ രഹിതൻ(ജോലി ചെയ്യുവാൻ കഴിയുകയില്ല Unemployed(unable towork)=09	☐☐
C6	താങ്കളുടെ ഇപ്പോഴത്തെ വൈവാഹിക നിലവാരം ***(യോജിച്ച ഒരെണ്ണം തിരഞ്ഞെടുക്കുക)***	വിവാഹിതരല്ല (Never married) -01 വിവാഹിതനാണ് (Currently married) -02 പിരിഞ്ഞത് (Separated)-03 വിവാഹ ബന്ധം വേർപെടുത്തിയത് (Divorced) -04 ഭർത്താവ്/ഭാര്യ മരിച്ചത് (Widowed)-05 കൂടെ താമസം (Cohabiting)-06	☐☐
C7	താങ്കൾക്ക് ശാരീരികമായ ബുദ്ധിമുട്ട് വന്നത് ഏത് വർഷമാണ്	എത് വർഷം	☐☐

സ്റ്റെപ്പ്- 1 പ്രധാന ശീലങ്ങൾ

പുകയില ഉപഭോഗം (T-വിഭാഗം)

ഞാൻ ഇപ്പോൾ താങ്കളോട് ആരോഗ്യശീലങ്ങൾ സംബന്ധിച്ച് ചില ചോദ്യങ്ങൾ ചോദിക്കുന്നതായിരിക്കും. ഇതിൽ പുകവലി, മദ്യത്തിന്റെ ഉപയോഗം ആഹാരരീതി ശാരീരിക അദ്ധ്വാനം എന്നിവ ഉൾപ്പെടുത്തിയിരിക്കുന്നു. ആദ്യമായി പുകയില ഉപഭോഗത്തെക്കുറിച്ച് ചോദിക്കാം.

Code	Question	Options	Response
T1a	ഇപ്പോൾ പുകവലിക്കുന്നുേ ാ (സിഗരറ്റ്, ബീഡി, ചുരുട്ട്) ?	Yes-1 No-2	☐ If no, go to A1a If yes, go to T1b
T1b	ദിവസേന ഉപയോഗിക്കുന്നുേ ാ?	Yes-1 No-2	☐
T2a	ആദ്യമായി പുകവലി തുടങ്ങിയത് എത്രാമത്തെ വയസ്സിലാണ്?	Age in years	☐☐
T2b	എത്രകാലമായിട്ട് പുകവലിക്കുന്നു?	വർഷം (In years) or മാസം (In month) Or ആഴ്ച (In weeks)	In years ☐☐ In months ☐☐ In weeks ☐☐
T3	ദിവസേന ശരാശരി എത്ര എണ്ണം ഉപയോഗിക്കുന്നു? (ഓരോന്നും രേഖപ്പെടുത്തുക)	സിഗരറ്റ് (Manufactured cigarettes) ബീഡി (Beedi) ചുരുട്ട്, പുകയില (Pipes full of tobacco/hooka/chillum) Cigars Others (specify) _____	☐☐ ☐☐ ☐☐ ☐☐

			☐☐
T4a	പുകയില്ലാത്ത പുകയില ഉല്പ്പന്നങ്ങൾ താങ്കൾ ഇപ്പോൾ ഉപയോഗിക്കു ന്നുേ ാ (പൊടി, മുറു ക്കാൻ, വെറ്റില, പാൻ മസാല മറ്റുള്ളവ)	Yes 1 No 2	☐ If no, go to A1a If yes, go toT4b
T4b	ദിവസേന ഉപയോഗിക്കു ന്നുേ ാ?	Yes 1 No 2	☐ If no, go to A1a If yes, go to T5
T5	ശരാശരി ഒരു ദിവസത്തിൽ എത്രപ്രാവശ്യം ഉപയോഗി ക്കുന്നു?	മൂക്ക് പൊടി (Snuff) പാക്ക് (Ghutka) ഖൈനി (Khaini) പുകയില (Chewing tobacco) വെറ്റില (Betel) Others(specify)_____	☐☐ ☐☐ ☐☐ ☐☐ ☐☐ ☐☐

Code: Don’t remember as 77, don’t know as 88 and not applicable as 99

മദ്യത്തിന്റെ ഉപഭോഗം A-വിഭാഗം

Code	Questions	Options	Response
A1a	മദ്യം എപ്പോഴെങ്കിലും ഉപ യോഗിച്ചുട്ടുേ ാ? (ബിയർ, വിസ്കി, റം, ജിൻ, ബ്രാൻഡി, വൈൻ, കള്ള്, ചാരായം)	Yes 1 No 2	☐ If yes ,go to A1b If no, go to D1
A1b	കഴിഞ്ഞ 12 മാസങ്ങൾക്കു ള്ളിൽ മദ്യം ഉപയോഗിച്ചി ട്ടുേ ാ ?	Yes 1 No 2	☐
A2	കഴിഞ്ഞ ഒരു വർഷത്തിനിട യിൽ എത്ര ഇടവിട്ട് കഴിച്ചി ട്ടു ്?	ആഴ്ചയിൽ 5 ദിവസത്തിൽ കൂ ടുതൽ=1 ആഴ്ചയിൽ 1 മുതൽ 4 ദിവസം=2 മാസത്തിൽ 1 മുതൽ 3 ദിവസം=3	☐

		മാസത്തിൽ 1 ൽ താഴെ=4	
A3	മദ്യപിക്കുമ്പോൾ ദിസേന ശരാശരി എത്ര ഡ്രിംഗ്സ് കഴിക്കും?	എണ്ണം (Number)	☐☐
A4	കഴിഞ്ഞ ഒരാഴ്ചയിൽ ഓരോ ദിവസവും എത്ര അളവിൽ മദ്യപിച്ചു? (ഓരോ ദിവസവും പ്രത്യേകം രേഖപ്പെടുത്തുക) <u>മദ്യത്തിന്റെ അളവ്</u> ബിയർ =285 ml മീഡിയം ഗ്ലാസ്സ് വൈൻ=120 ml ചാരായം, റം, കള്ള്, വിസ്കി= 30 ml	തിങ്കൾ ചൊവ്വ ബുധൻ വ്യാഴം വെള്ളി ശനി ഞായർ	☐☐ ☐☐ ☐☐ ☐☐ ☐☐ ☐☐ ☐☐

Code: Don't remember as 77, don't know as 88 and not applicable as 99

ആഹാരരീതി (D വിഭാഗം)

അടുത്തതായി പവവർഗ്ഗാദികൾ, പച്ചക്കറികൾ, മത്സ്യമാംസാഗദികൾ എന്നിവ കഴിക്കുന്നതിനെപ്പറ്റി ചിലചോദ്യങ്ങൾ ആണ് ചോദിക്കുവാൻ പോകുന്നത്. ഇതിനായി ഞാൻ ഒരു ന്യൂട്രീഷൻ കാർഡ് കാണിക്കുന്നതാണ്. അതിൽ കൊടുത്തിരിക്കുന്നതുപോലെ ഉള്ള അളവിൽ താങ്കൾ കഴിച്ച പഴവർഗ്ഗാദികൾ, പച്ചക്കറികൾ, മത്സ്യമാംസാദികളെപ്പറ്റി ഉത്തരം പറയണം.

Code	Question	Options	Response
D1a	സാധാരണ ആഴ്ചയിൽ എത്ര ദിവസം താങ്കൾ പഴ വർഗ്ഗങ്ങൾ കഴിക്കും?	എത്ര ദിവസം (Number of days)	☐ If 0 days ,go to D2a
D1b	കഴിക്കുന്ന ദിവസങ്ങളിൽ എത്രമാത്രം പഴവർഗ്ഗങ്ങൾ കഴിക്കും?	എത്ര അളവ് (Number of servings)	☐
D2a	സാധാരണ ആഴ്ചയിൽ എത്ര ദിവസം താങ്കൾ പച്ച ക്കറി കഴിക്കും ?	എത്ര ദിവസം (Number of days)	☐ If 0 days ,go to

			D3
D2b	കഴിക്കുന്ന ദിവസങ്ങളിൽ എത്രമാത്രം?	എത്ര അളവ് (Number of servings)	☐
D3	പാചകത്തിന് പതിവായി ഉപയോഗിക്കുന്ന എണ്ണ (ഒരെണ്ണം മാത്രം തിരഞ്ഞെടുക്കുക)	Vegetable oil (refined/unhydrogenated)=01 Vegetable oil(hydrogenated)=02 Butter or ghee=03 മറ്റുള്ളവയുടെപേര് _____=04 None in particular=05 Coconut oil=06	☐☐

Code: Don't remember as 77, don't know as 88 and not applicable as 99

ശാരീരിക അദ്ധ്വാനം (P വിഭാഗം)

അടുത്തതായി പലവിധശാരീരിക അദ്ധ്വാനത്തിനു താങ്കൾ ചിലവഴിക്കുന്ന സമയത്തെക്കുറിച്ചാണ് ചോദിക്കുവാൻ പോകുന്നത്. ആദ്യമായി ജോലി സംബന്ധമായി താങ്കൾ ചിലവഴിക്കുന്ന സമയത്തെപ്പറ്റി ചിന്തിക്കുക. ഇതിൽ ശമ്പളത്തോടുകൂടിയും ശമ്പളമില്ലാതെയും ചെയ്യുന്ന ജോലികൾ, വീട്ടുജോലികൾ, തൊഴിൽ അന്വേഷണം ഉൾപ്പെടുന്നു.

Code	Questions	Options	Response
P1	താങ്കളുടെ ജോലി പ്രധാനമായും കായികാദ്ധ്വാനം ഒട്ടും ഇല്ലാത്തതാണോ?	Yes-1 No-2	☐ If yes,goto P6
P2	താങ്കളുടെ ജോലി കുറഞ്ഞത് 10 മിനിട്ടെങ്കിലും കഡിനാദ്ധ്വാനമുള്ളതാണോ? (ഉദ: ഭാരം ചുമക്കുക, കിളക്കുക, മരം വെട്ട്)	Yes-1 No-2	☐ If no, go to P4
P3a	നിങ്ങളുടെ ജോലിയുടെ ഭാഗമായി ഒരാഴ്ചയിൽ എത്ര ദിവസം കഠിനാധ്വാനമുള്ള ജോലിചെയ്യുന്നു?	ആഴ്ചയിൽ എത്ര ദിവസം (Days per week)	☐☐
P3b	അത്തരം കഠിനാദ്ധ്വനമുള്ള ജോലി ഒരു ദിവസം എത്ര സമയെ ചെയ്യുന്നു?	In hours and minutes Or In minutes	☐☐:☐☐ hrs: mts ☐☐☐
P4	നിങ്ങളുടെ ജോലി കുറഞ്ഞത് 10 മിനിട്ടെങ്കിലും മിതാദ്ധ്വാനമുള്ളതാണോ?	Yes-1 No-2	☐ If no go to P6 If yes, go to P5a

	(ഉദ: വേഗത്തിൽ നടക്കുക, ശരാശരി ഭാരം ചുമക്കുക)		
P5a	മിതമായ അദ്ധ്വാനം ഉൽക്കൊ ഈ ജോലി ആഴ്ചയിൽ എത്ര ദിവസം ചെയ്യും?	ആഴ്ചയിൽ എത്ര ദിവസം (Days per week)	☐
P5b	മിതമായി അദ്ധ്വാനം ചെയ്യുന്ന ഒരു ദിവസത്തിൽ എത്ര സമയം അതിനായി ചിലവഴിക്കും?	In hours Or In minutes	☐☐:☐☐ hrs: mts ☐☐☐mts
P6	ഒരു പ്രവർത്തി ദിവസം എത്ര സമയം ജോലി ചെയ്യും?	എത്ര മണിക്കൂർ (Number of hours)	☐☐hrs

ഇനിതാങ്കൾ ഒരിടത്തിൽനിന്ന് മറ്റൊരിടത്തേക്ക് എങ്ങനെ യാത്ര ചെയ്യും എന്നതിനെപ്പറ്റി ആണ് ചോദിക്കുവാൻ പോകുന്നത് ഉദ: സാധനം വാങ്ങുന്നത്, ജോലിക്കുപോകുന്നത്.

P7a	കുറഞ്ഞത് 10 മിനിട്ടെങ്കിലും സൈക്കിൾ ചവിട്ടുകയോ കാൽ നടയാത്രയോ ചെയ്യാറുേ ാ?	Yes-1 No-2	☐
P7b	ഒരുടത്തുനിന്ന് മറ്റൊരിട ത്തേക്ക് എങ്ങനെയാണ് യാത്രചെയ്യുന്നത്?	Specify	_____
P8a	ഒരാഴ്ചയിൽ എത്ര ദിവസം 10 മിനിട്ടിൽ കുറയാതെ സൈക്കിൽ സവാരിയോ കാൽ നടയാത്രയോ ചെയ്യാറുണ്?	Days a week	☐
P8b	ഒരു ദിവസം എത്ര സമയം സൈക്കിൽ സവാരിയോ കാൽനടയാത്രയോ ചെയ്യും?	In hours Or In minutes	☐☐:☐☐ hrs: mts ☐☐☐mts

Code: Don’t remember as 77, don’t know as 88 and not applicable as 99

ഇനി താങ്കൾ വിശ്രമവേളയിൽ ചെയ്യുന്ന ജോലിയെപ്പറിയാണ് ഞാൻ ചോദിക്കാൻ പോകുന്നത്

Code	Questions	Options	Response
P9	വിനോദ/വിശ്രമവേളകളിലെ പ്രവർത്തി പ്രധാനമായും കായികാദ്ധ്വാനം ഇല്ലാത്ത	Yes-1 No-2	☐

	താണോ?		If yes, go to P14 If no, go to P10
P10	വിനോദവേളകളിൽ 10 മിനിട്ടെങ്കിലും കഠിനമായ ശാരീരിക അദ്ധ്വാനം ചെയ്യാറു ോ? (ഒടുക, ഭാരം ചുമക്കുക)	Yes-1 No-2	☐
P11a	ഒരാഴ്ചയിൽ എത്ര ദിവസം വിനോദവേളകളിൽ കഠിനമായ ശാരീരിക അദ്ധ്വാനം ചെയ്യാറു ്?	ആഴ്ചയിൽ എത്ര ദിവസം (Number of days)	☐
P11b	ഇതിനായി ഒരു ദിവസം എത്ര സമയം ചിലവഴിക്കും?	In hours or In minutes	☐☐:☐☐ hrs: mts ☐☐☐mts
P12	വിനോദവേളകളിൽ കുറഞ്ഞത് 10 മിനിട്ടെങ്കിലും മിതമായ ശാരീരിക അദ്ധ്വാനം ചെയ്യാറു ് (മിതവേഗത്തിൽ നടപ്പ്, നീന്തൽ, സൈക്കിൾ സവാരി)	Yes-1 No-2	☐ If yes, go to P13a If no, go to P14
P13a	ഒരാഴ്ചയിൽ എത്ര ദിവസം?	എത്ര ദിവസം (Number of days)	☐
P13b	ഒരു ശരാശരി ദിവസം എത്ര സമയം ചിലവഴിക്കുന്നു?	In hours Or In minutes	☐☐:☐☐ hrs: mts ☐☐☐mts

Code: Don't remember as 77, don't know as 88 and not applicable as 99

P14	കഴിഞ്ഞ ആഴ്ചയിൽ ഒരു സാധാരണ ദിവസം ഇരുന്നു, വിശ്രമിച്ചോ താങ്കൾ എത്ര സമയം ചിലവഴിച്ചു?	In hours Or In minutes	☐☐:☐☐ hrs: mts ☐☐☐mts

മുൻകാല ചികിത്സാ വിവരം (H വിഭാഗം)

The following questions are for the treatment received in the past 12 months for

Code	Questions	Options	Response
H1	ആരോഗ്യ പ്രവർത്തകൻ / ഡോക്ടർ ഏറ്റവും ഒടുവിൽ രക്തസമ്മർദ്ദം പരിശോധിച്ചത് എപ്പോൾ?	കഴിഞ്ഞ 12 മാസത്തിനുള്ളിൽ (Within past 12 months)-1 1 മുതൽ 5 വർഷങ്ങൾക്ക് മുമ്പിൽ (1-5 years ago)-2 കഴിഞ്ഞ 5 വർഷങ്ങൾക്കുള്ളിൽ ഇല്ല (Not within past 5 yrs)-3	☐
H2	കഴിഞ്ഞ ഒരു വർഷത്തിനകം എപ്പോഴെങ്കിലും താങ്കൾക്ക് ഉയർന്ന രക്തസമ്മർദ്ദം ഉള്ളതായി വൈദ്യ പരിശോധനയിൽ തെളിഞ്ഞിട്ടുേ ാ?	Yes-1 No-2	☐
H3	രക്തസമ്മർദ്ദതിനുള്ള ഏതെങ്കിലും ചികിത്സയ്ക്ക് താങ്കൾ ഇപ്പോൾ വിധേയനാണോ?	Yes-1 No-2	☐
H4	കഴിഞ്ഞ ഒരു വർഷത്തിനുള്ളിൽ എപ്പോഴെങ്കിലും താങ്കളുടെ രക്തത്തിൽ പഞ്ചസാരയുടെ അളവ് പരിശോധിച്ചിട്ടുേ ാ?	Yes-1 No-2	☐
H5	വൈദ്യ പരിശോധനയിൽ എപ്പോഴെങ്കിലും താങ്കൾക്ക് പ്രമേഹം ഉേ ന്ന് തെളിഞ്ഞിട്ടുേ ാ?	Yes-1 No-2	☐
H6	പ്രമേഹരോഗത്തിന് ഏതെങ്കിലും ചികിത്സയ്ക്കു താങ്കൾ ഇപ്പോൾ വിധേയനാണോ?	Yes-1 No-2	☐

STEP 2 PHYSICAL MEASUREMENTS

Code	Measurement	Findings
M1	Height	☐☐☐.☐ cms
M2	Weight	☐☐☐.☐kgs
M3	Waist circumference	☐☐☐.☐cms
M4	Cuff size used small-1	☐

		Normal-2 Large-3	
M4	Reading 1	systolic BP Diastolic BP (mm of Hg)	☐☐☐ ☐☐☐
M5	Reading 2	systolic BP Diastolic BP (mm of Hg)	☐☐☐ ☐☐☐
M6	Reading 3	systolic BP Diastolic BP (mm of Hg)	☐☐☐ ☐☐☐

DISABILITY ASSESSMENT

(Adapted from Indian health assessment questionnaire)

The Indian HAQ

	ദിനചര്യകർമ്മങ്ങൾ താങ്കൾക്ക് താഴെ പറയുന്ന കാര്യങ്ങൾ ചെയ്യുവാൻ കഴിയുമോ?	**യാതൊരു പ്രയാസവും കൂടാതെ (0)**	**കുറച്ചു പ്രയാസത്തോടുകൂടി(1)**	**ആധികം പ്രയാസത്തോടുകൂടി (2)**	**ചെയ്യുവാൻ ആസാദ്ധ്യമാണ് (3)**
1.	സ്വന്തമായി വസ്ത്രധാരണം ചെയ്യുക (സാരി, സൽവാർ, മു ് , ബട്ടൺ ഇടുന്നത് ഉൾപ്പെടെ)	☐	☐	☐	☐
2.	കിടക്കയിൽ നിന്ന് എഴുന്നേൽക്കുന്നതിനും കിടക്കുന്നതിനും	☐	☐	☐	☐
3.	ഒരു ഗ്ലാസ്സ് നിറയെ വെള്ളം വായിലേക്ക് കൊ ുപോകുക	☐	☐	☐	☐
4.	വെളിയിൽ നിരപ്പായ സ്ഥലത്ത് നടക്കുവാൻ കഴിയുമോ?	☐	☐	☐	☐
5.	ശരീരം മുഴുവൻ കഴുകു	☐	☐	☐	☐

	വാനും തുടയ്ക്കുവാനും കഴിയുമോ?				
6.	ടോയ്ലറ്റിൽ കുത്തിയിരിക്കുവാനും, തറയിൽ ചമ്മ്റം പടിഞ്ഞ് ഇരിക്കുവാനും കഴിയുമോ?	☐	☐	☐	☐
7.	തറയിൽ കിടക്കുന്ന വസ്ത്രം കുനിഞ്ഞെടുക്കുവാൻ കഴിയുമോ?	☐	☐	☐	☐
8.	ഒരു ടാപ്പ് തുറക്കാനും അടയ്ക്കാനും കഴിയുമോ?	☐	☐	☐	☐
9.	ഒരു കാറിലോ റിക്ഷായിലോ സ്വന്തമായി കയറുവാനും ഇറങ്ങുവാനും കഴിയുമോ?	☐	☐	☐	☐
10.	3 കിലോമീറ്റർ നടക്കുവാൻ കഴിയുമോ?	☐	☐	☐	☐
11.	പച്ചക്കറി കടയിൽ നിന്ന് സാധനങ്ങൾ വാങ്ങുവാൻ കഴിയുമോ?	☐	☐	☐	☐
12.	പടികൾ കയറുവാൻ കഴിയുമോ?	☐	☐	☐	☐

$$\text{Disability Index} \frac{\text{Sum of all scores}}{12}.$$

Appendix 5

SHOW CARDS

Alcohol Consumption

For use with This show card relates to:

Step	Section	Items
Step 1, core alcohol consumption	A	A1 to A5

1 standard bottle of **regular beer** (285ml)

1 single measure of **spirits** (30ml)

1 medium size glass of wine (120ml)

1 measure of **aperitif** (60ml)

Note: net alcohol content of a **standard drink is generally 10g.** of ethanol depending on the country. Countries will adapt this measure according to their own standards and will report this measure if different from the standard mentioned above

VEGETABLES are considered to be:	1 Serving =	Examples
Raw green leafy vegetables	1 cup	Spinach, salad, etc.
Other vegetables, cooked or chopped raw	½ cup	Tomatoes, carrots, pumpkin, corn, Chinese cabbage, fresh beans, onion, etc. 
Vegetable juice	½ cup	

FRUIT Is considered to be:	1 Serving =	Examples
Apple, banana, orange	1 medium size piece	
Chopped, cooked, canned fruit	½ cup	
Fruit juice	½ cup	Juice from fruit, not artificially flavoured

Serving size One standard serving = 80 grams (translated into different units of cups depending on type of vegetable and standard cup measures available in the country).