A CROSS SECTIONAL STUDY TO ASSESS THE RISK FACTORS OF SELECTED NON COMMUNICABLE DISEASES AMONG ADULTS ATTENDING MASTER HEALTH CHECKUP SERVICES AT SELECTED HOSPITAL, CHENNAI.

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ABSTRACT

Background: Non-communicable diseases (NCDs) are globally recognised threats. The aim of the study was to identify the risk factors of non- communicable diseases among adults attending master health check-up services. Materials and methods: A cross sectional research design was conducted among adults who attended master health check-up services and data was collected using pretested and predetermined tools such as background variablesproforma, bio physiological variables proforma, structured questionnaire for risk factors of non-communicable diseases and checklist for facilitators of the utilization of master health check-up services by face – to – face interview and review of records. The collected data were analysed in SPSS 20 version through descriptive and inferential statistics. Results: The study revealed that 8.91% and 12.44% of the adults had border line hypertension, 8.92% and 13.51% were hypertensive, 11.89% and 14.33% were at increased risk of contracting diabetes in future, 16.48% males and 24.3% females were diabetic respectively. There was a significant association of age (p<0.01), BMI (p<0.05), exercise (p<0.05) and sedentary work style (p<0.0001) with HbA1c and blood pressure. Conclusion: The present study findings revealed that diabetes and hypertension are the most prevailing non communicable diseases according to this study. Age, sedentary work, BMI, exercise were major contributing factors for NCDs such as diabetes and hypertension. Nurses are the largest group of health care professional and key providers of NCD prevention and management through providing information, education and counselling to the public.

Keywords: risk factors, non-communicable diseases, master health checkup. adults

Introduction

Non-communicable diseases (NCDs) are globally recognised threats. Thus, reducing the burden of NCDs has been included as one of the targets of the Sustainable Development Goals of United Nations (2016). Non-communicable diseases (NCDs) are illnesses or conditions that are not brought on by contagious substances. These long-lasting, chronic diseases typically progress slowly and are caused by a confluence of genetic, physiological, environmental, and behavioural factors. Diabetes, cancers, chronic respiratory illnesses, and cardiovascular diseases are the main NCDs. The primary behavioural risk factors for NCDs are physical inactivity, unhealthy diets (diets high in salt and fat but low in fruit, vegetables, and whole grains), tobacco use (smoking, second-hand smoke, and smokeless tobacco), and harmful alcohol use. They are a factor in hypertension (high blood pressu re), diabetes (high blood sugar), dyslipidaemia (high and abnormal blood lipids), and obesity. Both indoor and outdoor air pollution, which is primarily brought on by burning solid fuels for cooking and heating at home, are major risk factors for NCDs. In the twenty-first century, NCDs pose one of the greatest threats to public health, not only because of the suffering they cause to individuals, but also because of the harm they do to the nation's socioeconomic progress. Around 41 million people worldwide per year die from NCDs (71% of all deaths), including 14 million people who pass away too soon between the ages of 30 and 70. The majority of NCD deaths that occur too soon can be avoided. (National Health Portal Admin, 2019)

It is thought to be a factor in the 1.6 million annual deaths in India from ischemic heart disease and stroke. The burden of hypertension in India is being exacerbated by the country's demographic shift, which includes an increase in the proportion of elderly people, sedentary lifestyles, obesity linked to increased urbanisation, and other lifestyle factors like high salt intake, alcohol and tobacco use. (Ministry of Health & Family Welfare Government of India, 2016). According to the World Health Organization, non-communicable diseases (NCDs) will account for 41 million deaths worldwide in 2021, or 71% of all fatalities. Between the ages of 30 and 69, more than 15 million people per year pass away from an NCD; 85% of these "premature" deaths take place in low- and middle-income nations. Low- and middle-income nations account for 77% of all NCD fatalities. The majority of NCD deaths, or 17.9 million people each year, are caused by cardiovascular diseases, followed by cancers (9.3 million), respiratory illnesses (4.1 million), and diabetes (1.5 million). Over 80% of all NCD-related deaths that occur prematurely are caused by these four disease groups. Use of tobacco products, sedentary lifestyles, harmful alcohol use, and poor diets all raise the risk of dying from an NCD. Key elements of the response to NCDs include palliative care, NCD detection, screening, and treatment.

If effective NCD prevention and control measures are not taken. According to the WHO report from 2015, nearly 5.8 million Indians die from NCDs (heart and lung diseases, stroke, cancer, and diabetes) each year, or 1 in 4 Indians are at risk of dying from an NCD before they turn 70 (National Health Portal Admin, 2019). Concentrating on lowering the risk factors connected to these diseases is a crucial step in the control of NCDs. Governments and other stakeholders have access to low-cost solutions to lessen the prevalent modifiable risk factors. For policy and priorities to reduce the risks associated with NCDs and to support interventions to prevent and control them, it is crucial to monitor the development and trends of NCDs and their risk. It is essential to make investments in improved NCD management. To improve early detection and prompt treatment, high impact essential NCD interventions can be provided through a primary health care model. According to the evidence, these interventions are great financial investments because, if given to patients in a timely manner, they can prevent the need for more expensive treatment.NCD management interventions are

essential for achieving the SDG target on NCDs (WHO, 2022). Nurses make an important contribution to tackling NCDs and as the largest group of health care professionals are the key providers of NCD prevention, treatment and management. Nurses, as the point of first contact, are well positioned to detect, treat and refer patients with NCDs as well as to provide information, education and counselling to the public on prevention of NCDs. With their holistic approach to care, nurses must be well prepared to provide behavioural and lifestyle interventions that consider the social determinants of health and build on the strengths and resources of the individual and his/her community, using a person-centred approach (Hughes, 2016). Despite the studies conducted in western countries and other part of India, there is paucity of research in this area in Tamil Nadu. Hence the researcher has conducted this study to assess the risk factors among the adults attending master health checkup services in selected hospital, Chennai.

Statement of the problem

A Cross sectional Study to assess the Risk Factors of Selected Non Communicable Diseases among Adults Attending Master Health Checkup Services at Selected Hospital, Chennai.

Objectives

1. To identify adults with non-communicable diseases during master health checkup services.
2. To assess the risk factors of selected non-communicable diseases among adults attending master health checkup services.
3. To determine the association between background variables and non-communicable diseases among adults attending master health checkup services.

Materials and Methods

A cross-sectional study was conducted among adults attended master health check-up services at selected hospital Chennai. Totally 370 sample were selected by Consecutive Sampling technique. The data collection period was carried out with prior permission of concern authority of the hospital and obtained ethical approval from the Apollo College of nursing, Chennai. Determine the purposes of the sample survey and obtained written informed consent for the sample. A self-structured survey questionnaire was used. The characteristics of the sample are described by frequency and percentage was used for Description of socio-demographic variables, health variables and bio physiological variables, risk factors of selected Non communicable diseases, Facilitators for utilization of master health check-up services and prevalence of non-communicable diseases. Chi Square test ($\chi2$) Association of selected socio-demographic variables of non-communicable diseases and modifiable risk factors with selected non communicable diseases.

Results and Discussion

The study findings revealed that (table.1), 29.2% of the adults who attended master heath check-up were aged 41-50 years and more than half of them were males (59%). Majority of them were undergraduates (66.76%), sedentary workers (63.78%), married (80.54%), Hindus (83.78%), non-vegetarians (87.57%), with their family monthly income of >Rs.50000/- (68.11%), and had insurance coverage (93.78%). Around half of them were from nuclear family (51.08%), private employees (43.24%) and working in office (54.05%).

Similar study findings were reported in the study conducted by Al-Hanawi et.al., (2021) on socioeconomic determinants and inequalities in the prevalence of non-

communicable diseases. Gender disaggregation showed that both income-based and education-based concentration indices were significantly negative among women, indicating that the prevalence of NCDs is concentrated among women with a lower income level and with less education. The present study shows that inadequate knowledge on NCDs indicates a crucial need for formal educational programs to sensitize the general public.

Table 1: Frequency and Percentage Distribution of Demographic Variables of Adults Who Attended Master Health Checkup

(N=370)

Demographic variables	f	%
Age in years		
20-30	30	8.1
31-40	97	26.2
41-50	108	29.2
51-60	101	27.3
>60	34	9.2
Gender		
Female	151	40.81
Male	219	59.19
Educational Qualification		
Illiterate	2	0.54
Primary Education	2	0.54
Secondary Education	17	4.59
Higher secondary	32	8.65
Under Graduate	247	66.76
Post Graduate and Above	70	18.92
Occupational status		
Government employee	40	10.81
Private employee	160	43.24
Business	69	18.65
Farmers	5	1.35
Unemployed	44	11.89
Home makers	52	14.06
Family monthly income in Rs		
≤10000	6	1.62
10001-30000	14	3.78
30001-50000	98	26.49
Above 50000	252	68.11
Marital status		
Single	41	11.08

Married	298	80.54
Widow	31	8.38
Type of family		
Nuclear family	189	51.08
Joint Family	171	46.22
Extended family	10	2.7
Religion		
Hindu	310	83.78
Christian	27	7.3
Muslim	32	8.65
Others specify	1	0.27
Dietary Habits		
Vegetarian	40	10.81
Non Vegetarian	324	87.57
Ovatarian	6	1.62
Nature of work activities		
Sedentary	236	63.78
Light	63	17.03
Moderate	61	16.49
Heavy	10	2.7
Insurance facility		
Yes	347	93.78
No	23	6.22
Field of work		
Office/desk job	200	54.05
Outdoor travel	33	8.92
Shop	34	9.19
Home	102	27.57
Field	1	0.27

The percentage distribution of health variables show that, 19.46 % had Diabetes and 12.7% had Hypertension with the family history of diabetes mellitus (20.81%), hypertension (29.72%), Majority of them had priorly booked for master heath check-up (97.84%), more than half of them had personal preference to undergo master health check-up (55.95) and 27.84% received information about non communicable diseases from health care personnel.

The study findings (table.2) revealed that, the adults' mean height was 164.40cms with mean weight of 76.41 kg, waist hip ratio >1 cm (17.84%), systolic BP>130 mmHg and diastolic BP > 80 mm Hg (43.78%). More than half of them had overweight BMI of 25.0 -

29.9 kg/m^2 (55.95%). The diabetic profile reports demonstrate above normal values i.e., FBS >100mg/dl (47.84%), PPBS >140mg/dl (36.76%) and HbA1c >5.7(67.03%). The lipid profile reports were, total cholesterol > 170 mg/dl (73.24%), LDL ≥ 130 mg/dl (72.16%), HDL Cholesterol <40mg/dl (53.51%),Triglycerides >150 mg/dL-199 mg/dl (73.52%) and total cholesterol- HDL Ratio of <60mg/dl (61.35%).

The cardiac profile indicates that, ECG (18.38%), ECHO (4.32%) and TMT (4.32%) reports were abnormal. The LFT and RFT report shows serum ALP > 128 U/L (5.68%), ALT or SGPT >45U/L (9.73%), AST or SGOT > 35U/L (12.43%), Sr. Urea level > 13 mg/dl (8.92%) and Sr. Creatinine > 1.3 md/dL (2.17%).

Their hemotology report shows haemoglobin level <11.5 g/dL (24.33%), haematocrit (PCV) <37% (20%) and RBC count 4.2%-6.5% (48.92%). Mean corpuscular volume (MCV) was 75fl-95fl (70.27%), Mean corpuscular haemoglobin (MCH) of 26pg-32pg (72.43%), Mean corpuscular haemoglobin concentration (MCHC) of 32g/dl-36g/dl (75.95%), ESR range of > 20mm (49.19 %) and WBC count of 4×10^3 /mm3 - 11 $10^{3/mm3}$ (79.73%). The differential count shows the ranges of -0%-1% for basophils (52.43%), neutrophils- 40%-75% (81.89%), Lymphocytes-20%-40% (81.35%), Monocytes - 2%-10% (82.97%), Eosinophil's -1%-6% (74.6 %) and Platelets- 150,000 10^3 /mm3 – 400,000 10^3 /mm3 (72.43 %) respectively in adults who attended MHC.

The study findings were supported by a study conducted by Yasmin et,all (2019) revealed that 41.7% of the students were of 19 years of age. 53 were male (55.2%), 85.4% were Hindus. 80.4% were staying in the hostel. Majority of the participants were hailing from upper socioeconomic class, 70.4% were from nuclear family. Positive family history of hypertension (54.2%), cardio vascular diseases (10.4%), diabetes mellitus (40.6%), obesity (20.8%), and dyslipidemia (07.3%) were present. The lifestyle related findings 53.1% did no exercise. 12.5% were current smokers, 8.3% were alcohol users. 85.4% were non vegetarians and 95.8% skipped meals. Although 68.85 had vegetables only 17.7% had adequate fruits. 66.7% had history of intake of adverse food habit. 46.5% female and 37.7% male had mild to moderate risk of high BMI, 51.2% female and only 1.8% male had abnormal waist circumference. None of the boys but 46.5% girls had abnormal waist hip ratio. 34.8% female and 35.8% males were pre hypertensive while 4% boys but no girls were frank hypertensive according to JNC-8 criteria. The laboratory report of 22 students undergoing blood test. 4.5% were early diabetic. 13.6% had borderline risk and 4.5% high risk for blood cholesterol. 9.1% had high risk of blood triglyceride.

Table: 2 Frequency and Percentage Distribution of Bio Physiological Variables of Adults Attending Master Health Checkup

(N=370)

Bio Physiological Variables	f	%
Waist Hip Ratio		
Less than 1	304	82.16
More than 1	66	17.84
Blood Pressure		
120 / 80 mm of Hg	133	35.95
120-129 / <80 mm of Hg	75	20.27
130-139 / 80-89 mm of Hg	79	21.35

140 -179 / 90 - 119 mm of Hg	73	19.73
≥180 / ≥120 mm of Hg	10	2.7

Diabetic profile
Fasting blood sugar

<70 mg/dl	29	7.84
70-100 mg/dl	164	44.32
101 -125 mg/dl	100	27.03
>125 mg/dl	77	20.81

Post prandial blood sugar

<70mg/dl	23	6.22
70-140mg/dl	211	57.02
141-200mg/dl	78	21.08
>200mg/dl	58	15.68

HbA1c whole blood

<5.7% - Normal	122	32.97
5.7 % to 6.4% - Increased risk	97	26.22
≥ 6.5% - Diabetes	91	24.59
>7% - highly Risk	60	16.22

Lipid profile

Total Cholesterol

<170 mg/dl Desirable	99	26.76
170 mg/dl - 199 mg/dl Borderline High	123	33.24
200 mg/dl - 239 mg/dl High	106	28.65
≥ 240 mg/dl Very High	42	11.35

LDL Cholesterol

<130 mg/dl Desirable	103	27.84
130 mg/dl -159 mg/dl Borderline High	129	34.86
160 mg/dl -189 mg/dl High	96	25.95
≥ 190 mg/dl Very High	42	11.35

HDL Cholesterol

≥ 40 mg/dl Desirable	172	46.49
< 40 mg/dl low	198	53.51

Triglycerides

<150 mg/dl Desirable	98	26.48

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150-199 mg/dl Borderline High	131	35.41
>200 mg/dl High	109	29.46
>500 mg/dl Very High	32	8.65

Total Cholesterol- HDL Cholesterol Ratio

>60 mg/dl Desirable	143	38.65
40 mg/dl- 60 mg/dl Borderline High	113	30.54
<40 mg/dl High	114	30.81

Cardiac profile
ECG

Normal	302	81.62
Abnormal	68	18.38

ECHO

Normal	354	95.68
Abnormal	16	4.32

TMT Impression

Normal	354	95.68
Abnormal	16	4.32

Liver profile
Alkaline Phosphatase-Serum

Male:<128 U/L	198	53.52
$\geq$ 128 U/L	21	5.68
Female:<98 U/L	131	35.4
$\geq$ 98 U/L	20	5.4

ALT (SGPT)-Serum

Male: <45 U/L	183	49.46
$\geq$ 45 U/L	36	9.73
Female: <35 U/L	133	35.95
$\geq$ 35 U/L	18	4.86

AST (SGOT)-Serum

Male:<35 U/L	173	46.75
$\geq$ 35 U/L	46	12.43
Female:<31 U/L	133	35.95
$\geq$ 31 U/L	18	4.87

Renal Profile
Serum Urea

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<13 mg/dl	40	10.81
13mg/dl – 43mg/dl	297	80.27
>43mg/dl	33	8.92

Serum Creatinine

Men: 0.8 mg/dl-1.3 mg/dl	184	49.72
<0.8 mg/dl	27	7.29
>1.3 mg/dl	8	2.17
Female: 0.6 mg/dl-1.2 mg/dl	126	34.05
<0.6 mg/dl	16	4.33
>1.2 mg/dl	9	2.44

Haematology profile
Haemoglobin (HB)

Male: 13-18 g/dl	187	50.54
<13 g/dl	30	8.1
>18 g/dl	2	0.54
Female: 11.5 -16.5 g/dl	61	16.49
<11.5 g/dl	90	24.33
>16.5 g/dl	0	0

Packed cell volume (PCV)

Male: 40%-54%	190	51.35
<40%	24	6.48
>54%	5	1.35
Female: 37%-47%	73	19.73
<37%	74	20
>47%	4	1.09

Red blood cell count (RBC)

Male: 4.2%-6.5%	181	48.92
<4.2 %	30	8.1
>6.5%	8	2.16
Female: 3.7%-5.6%	101	27.29
<3.7 %	49	13.26
>5.6 %	1	0.27

Mean corpuscular volume (MCV) in femtoliters

<75 fl	38	10.27
75 fl - 95 fl	260	70.27
>95 fl	72	19.46

Mean corpuscular haemoglobin (MCH) in picograms

< 26 pg	36	9.73
26 pg - 32 pg	268	72.43
> 32 pg	66	17.84

Mean corpuscular haemoglobin Concentration (MCHC)

<32 g/dl	40	10.81
32 g/dl – 36 g/dl	281	75.95
>36 g/dl	49	13.24

Erythrocyte sedimentation rate (ESR)

>20mm	182	49.19
0 - 20mm	188	50.81

White blood cells (WBC)

<4 $10^{3 /mm3}$	32	8.65
4 $10^{3 /mm3}$ - 11 $10^{3 /mm3}$	295	79.73
>11 $10^{3 /mm3}$	43	11.62

Basophil

0% - 1%	194	52.43
>1%	176	47.57

Neutrophils

<40%	28	7.57
40% - 75%	303	81.89
>75%	39	10.54

Lymphocytes

<20%	20	5.41
20% - 40%	301	81.35
>40%	49	13.24

Monocytes

<2%	15	4.05
2% - 10%	307	82.97
>10%	48	12.98

Eosinophils

<1%	10	2.70
1%-6%	276	74.6
>6%	84	22.70

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Platelets

<150,000 $10^{3 \,/mm3}$	10	2.70
150,000 $10^{3 \,/mm3}$ – 400,000 $10^{3 \,/mm3}$	268	72.43
>400,000 $10^{3 \,/mm3}$	92	24.86

The study results regarding newly diagnosed NCDs, 8.91% and 12.44% had border line hypertension, 8.92% and 13.51% were hypertensive, 11.89% and 14.33% were at increased risk of contracting diabetes in future, 16.48% and 24.3% were diabetic among males and females respectively as in table 1.

Similar study findings were reported in the study conducted by Sathiyamoorthi (2019) a cross sectional study to evaluate the usefulness of MHC in a hospital based setting, among 337 subjects aged 18 years and above who attended the MHC Clinic during the study period. The results revealed that, among the 337 participants, 244 were apparently normal with a gender distribution as 109 (44.7%) males and 135 (55.3%) females. The study was able to newly detect 12.3% with Type 2 diabetes, 37.7% in pre-diabetic stage, 54.1% with anaemia, 42.2% with dyslipidaemia, 11.5% with hypothyroidism, 27% with liver disorders and 6.5% with renal disorders, about which the participants were unaware of. Females also had statistically significant association with dyslipidaemia and hypothyroidism compared to males with a p-value of 0.004, 0.026 respectively. Apparently normal participants aged > 35 years had strong statistical association with diabetic status and dyslipidaemia compared to those aged between 18 – 35 years (p-value 0.001). The study concluded that based on the results from the study it is evident that a significant number of NCDs were newly identified by Master Health Checkup (MHC).

Table: 3 Frequency and Percentage Distribution of Newly Diagnosed Non Communicable Diseases among Adults who Attended Master Health Check-up Services (N=370)

Variables	Gender			
	Females		Males	
	F	%		%
Blood Pressure in mm of Hg				
120 / 80 – Normal	52	14.06	81	21.89
120-129 / <80 - Elevated	33	8.91	42	11.36
130-139 / 80-89 - Stage 1 Hypertension	**33**	**8.91**	**46**	**12.44**
>140 / > 90 - Stage 2 Hypertension	**29**	**7.84**	**44**	**11.89**
>180 / > 120 - Hypertensive Crisis	**4**	**1.08**	**6**	**1.62**
HbA1c whole blood in percentage				
<5.7% - Normal	46	12.43	76	20.54
5.7 - 6.4% - Increased risk	**44**	**11.89**	**53**	**14.33**
6.5 - 6.9% Diabetes	**38**	**10.27**	**53**	**14.33**
≥7 - Risk for Complication	**23**	**6.21**	**37**	**10**

As per the findings, the facilitators for doing MHC were referred by family physician (29.46%), due to few symptoms (5.95%), routine health check-up from the organization 39.18%, routine medical health check-up for joining in employment in organization (38.38%) and screening for overseas employment or studies in abroad were (4.32%). Most of them came for master health check with the intention to stay healthy and away from the risk of

many kinds of diseases (83.25%), identify any existing or potential illness early and to take appropriate treatment (83.25%) and insisted by the family members (68.65%).

The table 4. Shows that the distribution of non-modifiable risk factors of non-communicable diseases were, the family history of NCDs (62.44%), previous history of hospitalization (22.16%) and menopause (19.93%). The distribution of modifiable risk factors of non-communicable diseases were, rarely undergoing MHC (81.89%), consumption of non-vegetarian food (87.57%), habits of smoking (14.05%), alcohol (28.92%), eye opener drink in morning (2.97%), consuming tobacco (1.08%), no habit of using Gym/Treadmill/Elliptical (35.14%) or lifting weights for muscle building (58.93%), being sedentary worker (14.86%), use of snuff (2.16%), increased consumption (≥ 2 times a week) of salted snacks (47.57%), fried foods (52.16%), fatty food (30.28%), red meat (42.17%), butter/ghee/refined oil/dalda (68.66%), caffeinated drink daily (90.81%), less intake of dietary fiber (5.68 %). Other modifiable risk factors of non-communicable diseases were, irregular in doing yoga / meditation / deep breathing / aerobic exercises (15.67%), perceived moderate to severe stress (28.64%), working ≥ 9hrs (25..94%), sleeping <6hrs (12.16%), day time sleep >2 -4 times a week (60.54%), doing exercise irregularly (20.27%) and watching TV before going to bed (20.81%).

Table: 4 Frequency and Percentage Distribution of Risk Factors of Non Communicable Diseases among Adults who Attended Master Health Checkup

(N=370)

Risk Factors of Non Communicable Diseases	f	%
Family history of non communicable diseases (known and diagnosed cases)		
Diabetic mellitus	77	20.81
Hypertension	110	29.72
COPD	15	4.05
Renal diseases	17	4.59
Heart diseases	36	9.72
Liver diseases	13	3.51
Cancers	21	5.67
Obesity	39	10.54
Any other specific diseases	1	0.27
Nil	139	37.56
Frequency of master health checkup		
Once in 6 months	19	5.14
Once in a year	26	7.02
Once in two years	20	5.41
Whenever any symptoms appears	2	0.54

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Rarely	**303**	**81.89**
Dietary Habits		
Vegetarian	**40**	**10.81**
Non vegetarian	**324**	**87.57**
Ovatarion	**6**	**1.62**
Habit of smoking		
No	**318**	**85.95**
Yes	**52**	**14.05**
Yes –since < 1 year	**47**	**90.39**
Yes –since 1-5 year	**3**	**5.76**
Yes –since > 5 year	**2**	**3.85**
If yes specify how many cigarettes per day		
Habit of Alcohol Consumption		
No	**263**	**71.08**
Yes	**107**	**28.92**
If yes specify		
Daily	**39**	**36.45**
Weekly	**48**	**44.85**
Occasionally	**20**	**18.7**
Eye opener drink		
No	**359**	**97.03**
Yes	**11**	**2.97**
Habits of Using Tobacco		
No	**366**	**98.92**
Yes	**4**	**1.08**
If present how often		
Daily	**2**	**50**
Weekly	**2**	**50**
Occasionally	**-**	**-**
Previous History of Hospitalization		
No	**288**	**77.84**
Yes	**82**	**22.16**
If yes specify when and Reason for hospitalization		
Use GYM		
Daily	**18**	**4.86**
5-6 times a week	**53**	**14.32**

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2-4 times a week	40	10.81
Once a week	60	16.22
Occasionally	69	18.65
Never	130	35.14
Habits of lifting weights for muscle building		
Daily	17	4.59
5-6 times a week	27	7.3
2-4 times a week	16	4.32
Once a week	49	13.24
Occasionally	43	11.62
Never	218	58.93
Sedentary work		
No	315	85.14
Yes	55	14.86
If yes, how often		
Habit of using Snuff		
No	362	97.84
Yes	8	2.16
Consumption of salted snacks		
Daily	21	5.67
5-6 times a week	99	26.76
2-4 times a week	56	15.14
Once a week	125	33.78
Occasionally	56	15.14
Never	13	3.51
Consumption of fried foods		
Daily	27	7.3
5-6 times a week	127	34.32
2-4 times a week	39	10.54
Once a week	110	29.73
Occasionally	57	15.41
Never	10	2.7
Consumption of fatty foods		
Daily	40	10.81
5-6 times a week	80	21.62
2-4 times a week	112	30.28

Once a week	83	22.43
Occasionally	44	11.89
Never	11	2.97
Consumption of red meat		
Daily	20	5.41
5-6 times a week	75	20.27
2-4 times a week	61	16.49
Once a week	115	31.08
Occasionally	53	14.32
Never	46	12.43
Consumption of dietary fiber		
Daily	349	94.32
5-6 times a week	8	2.16
2-4 times a week	13	3.52
Once a week	-	-
Occasionally	-	-
Never	-	-
Consumption of caffeinated drink		
Daily	336	90.81
5-6 times a week	20	5.41
2-4 times a week	8	2.16
Once a week	6	1.62
Occasionally	-	-
Never	-	-
Use of butter, ghee/ refined oil/ dalda		
Daily	101	27.3
5-6 times a week	59	15.95
2-4 times a week	94	25.41
Once a week	82	22.16
Occasionally	34	9.18
Never	-	-
Meditation/ deep breathing exercises/ yoga/prayers or aerobic exercise to reduce stress		

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Daily	170	45.95
5-6 times a week	61	16.49
2-4 times a week	81	21.89
Once a week	46	12.43
Occasionally	12	3.24
Never	-	-
Perceived stress		
Nil	58	15.68
Mild	206	55.68
Moderate	90	24.32
Severe	16	4.32
Attained menopause (Female N=151)		
Before 1-10 yrs	49	13.24
Before 11-20 yrs	24	6.49
Not attained	78	21.08
Not applicable for (Men)	219	59.19
Number of working hours		
6-8	274	74.06
9-12	85	22.97
>12	11	2.97
Number of sleeping hours		
<6 hrs	45	12.16
6-8 hrs	219	59.19
>8 hrs	106	28.65
Day time sleepiness		
Daily	43	11.62
5-6 times a week	103	27.84
2-4 times a week	78	21.08
Once a week	76	20.55
Occasionally	53	14.32
Never	17	4.59
Sleep habits		
Milk	119	32.16
Song/music	119	32.16
Watching TV	77	20.81
Bathing	48	12.98
Others	7	1.89

The results project that there is a need for wise, decisive, and integrated care interventions for effective management of NCDs and their risk factors. Similar findings were reported in the study conducted by Gamage, et.al., (2017). The results revealed that the proportion students with good overall knowledge was 43% (n = 272). Forty-three percent (n = 275) consumed a healthy diet, and 20% (n = 129) engaged in adequate physical activity 3% (n = 18) of students were current smokers and 12% (n = 73) current alcohol users 12% (n = 73).

According to Bhattacharya et al (2021), in their study on dietary salt consumption pattern as an antecedent risk factor for hypertension: Status, vision, and future recommendations, the salt consumption is high in India, regardless of the diversity in dietary patterns and environmental conditions across the country. There is an urgent need to address these issues through evidence-based population research.

In this study, there was a significant association of age with HbA1c, and Blood pressure ($p<0.01$). However, there was no significant association of HbA1c and Blood pressure with other selected demographic variables like gender, diet and family history.

Wong, et al., (2018), conducted a study on prevalence and modifiable risk factors of non-communicable diseases such as hypertension, diabetes mellitus and dyslipidaemia dyslipidaemia among Jakun orang asli population and examined the association with risk factors. Prevalence was 41.7% for hypertension, 25% for Diabetes mellitus, 6.9% for dyslipidaemia. Education level was significantly related to hypertension, obesity was significantly related to diabetes. After adjusted for covariates, low education level has 13.379 odds of getting hypertension. Obesity has 7.384 odds of getting diabetes mellitus; female gender has higher odds of getting dyslipidaemia while younger age, physically active and not smoking are protective factors. The higher prevalence of hypertension and diabetes mellitus was found among Tasik Chini orang asli population. Lower socio demographic characteristics and unhealthy lifestyle factors are associated with the diseases. Various studies have shown that the prevalence of obesity among women were significantly higher as compared to men. Obesity is one of the main medical and financial burdens for the government (Ahirwar, 2018).

There was significant association of BMI with HbA1c ($p<0.009$) and Blood pressure ($p<0.01$), Exercise with Blood pressure ($p<0.05$) and HbA1c with sedentary work ($p<0.0001$). The results were also in accordance with the study conducted by **Tsimihodimos** et., all (2018), reveals that people at high risk for the development of either hypertension or diabetes mellitus share common metabolic abnormalities, that is, abdominal obesity, hyperinsulinemia, and hypertriglyceridemia (even more prominent in those destined to develop both abnormalities). Thus, the general population contains a pool of individuals with the phenotype of the metabolic (or insulin resistance) syndrome from which new hypertension or diabetes mellitus (or both) emerge over time. Importantly, weight gain may be one factor that contributes to the development of both hypertension and diabetes mellitus.

This problem of obesity can be preventable by spreading public awareness about obesity and its health consequences. Governmental agencies should promote the benefits of healthy life style, food habits and physical activity (Ahirwar, 2018).

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Table: 5 Association of Socio Demographic and Behavioural Variables with the Selected Non Communicable Diseases among Adults Attended Master Health Checkup

(N= 370)

Sociodemographic Variables	Hbalc				Blood pressure			
	Normal	Risk	Diabetic	χ^2 and p Value	Normal	Border line HT	HT	χ^2 and p Value
Gender								
Female	46	44	61	1.33	85	33	33	0.068
Male	76	53	90	df=2 p=0.51	123	46	50	df=2 p=0.96
Age								
21-30	22	6	2	**82.37 df=8 p=0.00**	19	10	1	**31.03 df=8 p=0.01**
31-40	68	16	12		43	36	17	
41-50	54	23	32		32	24	53	
51-60	53	25	23		25	23	53	
Above 60	11	9	14		3	4	27	
Diet								
Vegetarian	15	9	15	0.293	24	8	7	0.6247
Non vegetarian	117	88	136	df =2 p=0.86	184	71	76	df =2 p=0.73
Family history								
Yes	21	24	29	2.01	155	56	50	5.82
No	101	73	122	df =2 p=0.36	53	23	33	df =2 p=0.05
Behavioural Variables								
BMI								
18.5-24.9 Healthy weight	21	14	9	**13.28 df=4 0.009**	30	10	4	**14.43 df=4 p=0.006**
25.0-29.9 Over weight	70	55	81		125	40	41	
≥30 Obese	31	28	6		53	29	38	
Exercise				1.70				**6.49 df=2 p=0.03**
Yes	116	77	114	df=2 p=0.42	166	53	68	
No	26	20	37		42	26	15	
Salted snacks								
Yes	60	43	73	0.57	99	34	43	1.24
No	62	54	78	df=2 p=0.75	109	45	40	df=2 p=0.53
Fried food								
Yes	66	54	73	1.54	109	39	45	0.39
No	56	43	78	df=2 p=0.46	99	40	38	df=2 p=0.82
Oily food								
Yes	71	63	98	1.58	131	49	52	0.02
NO	51	34	53	df=2 p=0.45	77	30	31	df=2 p=0.98

Red meat								
Yes	55	45	56	2.73	91	31	34	0.54
No	67	52	95	df=2 p=0.25	117	48	49	df=2 p=0.76
Sleeping hours								
<6hrs	16	15	14	8.27	21	10	14	7.62
6-7hrs	81	53	85	df=4	135	44	40	df=4
8 hrs & Above	25	29	52	p=0.08	52	25	29	p=0.10
Sedentary work								
No	92	82	141	**17.25**	171	72	72	3.825
Yes	30	15	10	**df=2 p=0.001**	37	7	11	df=2 p=0.14

Conclusion

The present study findings revealed that, non-communicable diseases are one of the most common life style diseases today. Diabetes and hypertension are the most prevailing non communicable diseases according to this study. Age is the major contributing risk factor for both in Diabetes and hypertension in socio demographic factors. Behavioural factors such as sedentary work, BMI, exercise were contributing factors for NCDs such as diabetes and hypertension. Nurses are the largest group of health care professional and key providers of NCD prevention and management. Nurses, as the point of first contact should be competent enough to detect treatment and refer the patients with NCDs as well as to provide information, education and counselling to the public on its prevention.

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There are no conflicts of interest

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