

Assessment Of Risk Factors Associated With Non Communicable Diseases

Results Of Community Based Study In Keshavpuram, New Delhi



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Introduction

- ❑ Non-communicable diseases (NCD), can be defined as Chronic conditions that do not result from an (acute) infectious process and hence are “not communicable.”
- ❑ Types of NCDs are cardiovascular diseases (e.g. hypertension and stroke), cancers, chronic respiratory diseases and diabetes
- ❑ **Risk factors:** Aspects of lifestyle, environmental exposure, hereditary characteristic which are associated with increase in the occurrence of a health condition
- ❑ **Modifiable Risk Factor:** A behavioural risk factor that can be reduced or controlled by intervention, thereby reducing the probability of disease.
- ❑ **Non-Modifiable Risk Factor:** A risk factor that cannot be reduced or controlled by intervention. E.g. Age, Gender, and Family history (genetics).

Rationale of Study

- According to WHO, the prevalence of NCDs will lead to as many deaths as communicable, maternal, and nutritional diseases together by 2020
- NCD's will exceed Non NCDs as the most common causes of death by 2030
- Socioeconomic factors play an important role in adolescent quality of life, health and lifestyle, but little is known about the association between socio demographic status and Chronic NCD risk factors
- Moreover, it is important to investigate how risk factors combine and is distributed in different socio- demographic strata. Such data may support interventional strategies to reduce health problems among young individuals



Research Question:

- ❑ What is the occurrence of behavioral risk factors?
- ❑ To what extent socio-demographic and behavioral risk factors predict occurrence of Non Communicable Diseases in individuals?
- ❑ What is pattern of health insurance in the individuals?

Objective of study:

- ❑ To estimate the prevalence of various behavioral risk factors responsible for Non Communicable Diseases among individuals
- ❑ To study the association of different types of risk factors with occurrence of non communicable diseases
- ❑ To study the health insurance pattern of individuals

Methodology (1/2)

- ❑ **Study Design:** The study was descriptive study on sample which was representation of adults in middle income community in New Delhi
- ❑ **Sampling:** Using non probability sampling, descriptive study was done on families living in Delhi Development authorized middle income group (DDA MIG) flats
- ❑ **Size Calculation:** The target sample size was 150 persons of 25 years to 50 year of age. Sample included around 50% male and 50% Female individuals
- ❑ **Sample Selection:** Participants were selected in a community of Keshavpuram consisting ~5,000 middle income group houses/family
- ❑ **Inclusion Criteria:** Adults of/more than 25 years of age
(25 year is the age when most of the middle class Indian adults complete their studies, become independent and can be considered responsible for their behavioral and social habits)
- ❑ **Exclusion Criteria:** Men or women more than 50 years of age and pregnant women
(To avoid the bias of pregnancy and old age related /originated patho-physiological conditions, co-morbidities)

Methodology (2/2)

□ Data Collection Tools

Data was collected through questionnaire which included questions on behavioral risk factors, present status of chronic diseases, health insurance, family history

The data analysis was done using statistical software SPSS 16.0

Risk factors of non communicable diseases used in questionnaire are:

- *Behavioral risk factors: Tobacco use, Diet habits, Physical activity etc*
- *Demographic factors: Age, Gender*
- *Co-morbidity: Diabetes, Hypercholesterolemia, Hypertension, Hypotension etc*
- *Biochemical risk factors: Overweight, Obesity, others*

□ Ethical Considerations

1. Consent of participants was taken prior to survey
2. Data security was assured
3. Privacy and confidentiality of patient was assured



Research Findings

Demographics

- ❑ N: 111
- ❑ Minimum age: 26 years, Maximum age: 45 years, Mean age: 32.5 years

Smoking and chewing habits:

- ❑ Significantly higher smoking (89.2%) and chewing habit (84.7%) was found in the study.

Age category		1 (26-30 years)	2(31-35 years)	3(36-40 years)	4(41-45 years)	Average	p value (95%CI)
Habit Of Smoking	No	0.00%	3.90%	37.50%	53.80%	10.80%	0.000
	Yes	100.00%	96.10%	62.50%	46.20%	89.20%	
Habit Of Chewing Tobacco and other substances	No	2.60%	5.90%	87.50%	46.20%	15.30%	0.000
	Yes	97.40%	94.10%	12.50%	53.80%	84.70%	

Fruit Consumption habit:

- ❑ Percentage of respondents eating fruit 'everyday' is 4.5%
- ❑ People should make a habit of eating 2 to 3 parts of fruit every day because people who eat more fruits and vegetables are likely to have a reduced risk of some chronic diseases. Fruits provide nutrients vital for health and maintenance of your body.

Age category		1 (26-30 years)	2(31-35 years)	3(36-40 years)	4(41-45 years)	average	p value (95%CI)
habit of eating fruit	Everyday	2.60%	0.00%	12.50%	23.10%	4.50%	0.000
	3 to 4 days a week	0.00%	2.00%	0.00%	7.70%	1.80%	
	1 to 2 days a week	0.00%	90.20%	25.00%	15.40%	45.00%	
	Once in 2 to 3 weeks	97.40%	7.80%	50.00%	38.50%	45.90%	
	Once in a month	0.00%	0.00%	12.50%	15.40%	2.70%	

Mental Stress:

- ❑ Percentage of respondents who were mentally stressed 'frequently' were 10.8%. Most of the respondent fall in 'occasionally' group.
- ❑ Since prolonged stress can impact our health, it's important to develop positive coping mechanisms to manage the stress in our life.

Age category		1 (26-30 years)	2(31-35 years)	3(36-40 years)	4(41-45 years)	average	p value (95%CI)
Mentally Stressed	Frequently	0.00%	5.90%	25.00%	53.80%	10.80%	0.000
	Occasionally	100.00%	92.20%	75.00%	30.80%	86.50%	
	Rarely	0.00%	2.00%	0.00%	15.40%	2.70%	

Physical Inactivity and Exercise schedule:

- Percentage of respondents 'never' exercising was 0.9%, thus most of them were aware about the importance of exercise but the percentage exercising '21 to 30 days' in a month was not significant i.e. 4.5%. Majority of respondents, 92.8% exercise '1 to 10 days' in a month
- The benefits of exercise diminishes if it is not continuous. A "stop-start" routine of exercising is ineffective. Therefore being consistent with exercise, is probably the most important factor for fitness.

Age category		1 (26-30 years)	2(31-35 years)	3(36-40 years)	4(41-45 years)	average	p value (95%CI)
exercise schedule	21 to 30 days in a month	0.00%	2.00%	12.50%	23.10%	4.50%	0.000
	11 to 20 days in a month	0.00%	0.00%	0.00%	15.40%	1.80%	
	1 to 10 days in a month	100.00%	98.00%	75.00%	61.50%	92.80%	
	Never	0.00%	0.00%	12.50%	0.00%	0.90%	
physical activity	Low	100.00%	9.80%	62.50%	30.80%	47.70%	>0.005
	Medium	0.00%	90.20%	12.50%	30.80%	45.90%	
	High	0.00%	0.00%	25.00%	38.50%	6.30%	

Body Mass Index:

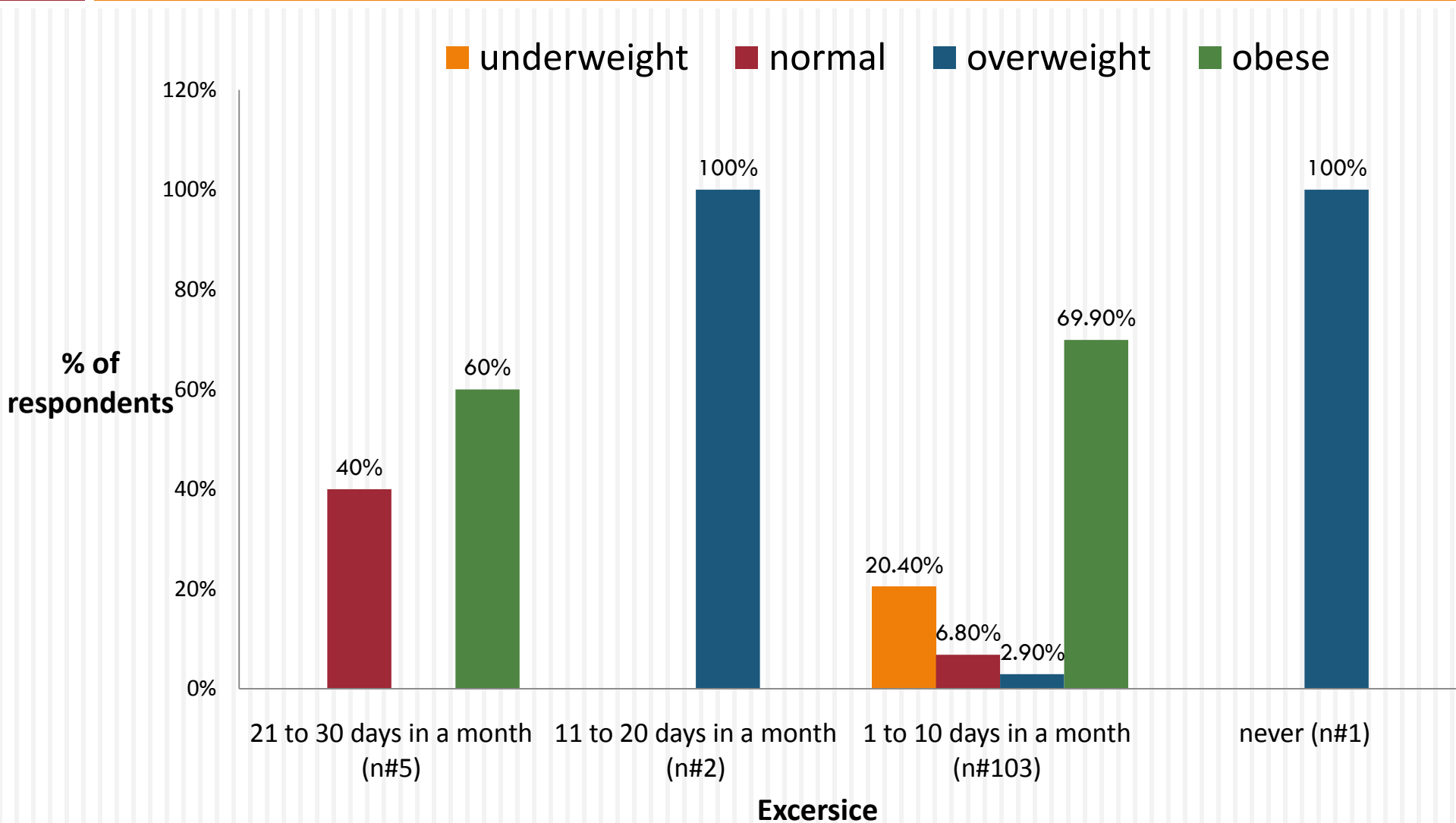
- ❑ Significantly higher prevalence of obesity was found among males 89.1% whereas 7.1% females were found to be obese
- ❑ Percentage of male respondent who were overweight were 7.3%, and female respondent were 3.6%
- ❑ One of the reason can be higher proportion of male respondent has sedentary lifestyle.

		body mass index			p value (95%CI)
gender of person		underweight	overweight	obese	>0.005
	female	76.80%	3.60%	7.10%	
	male	0.00%	7.30%	89.10%	
average		38.70%	5.40%	47.70%	

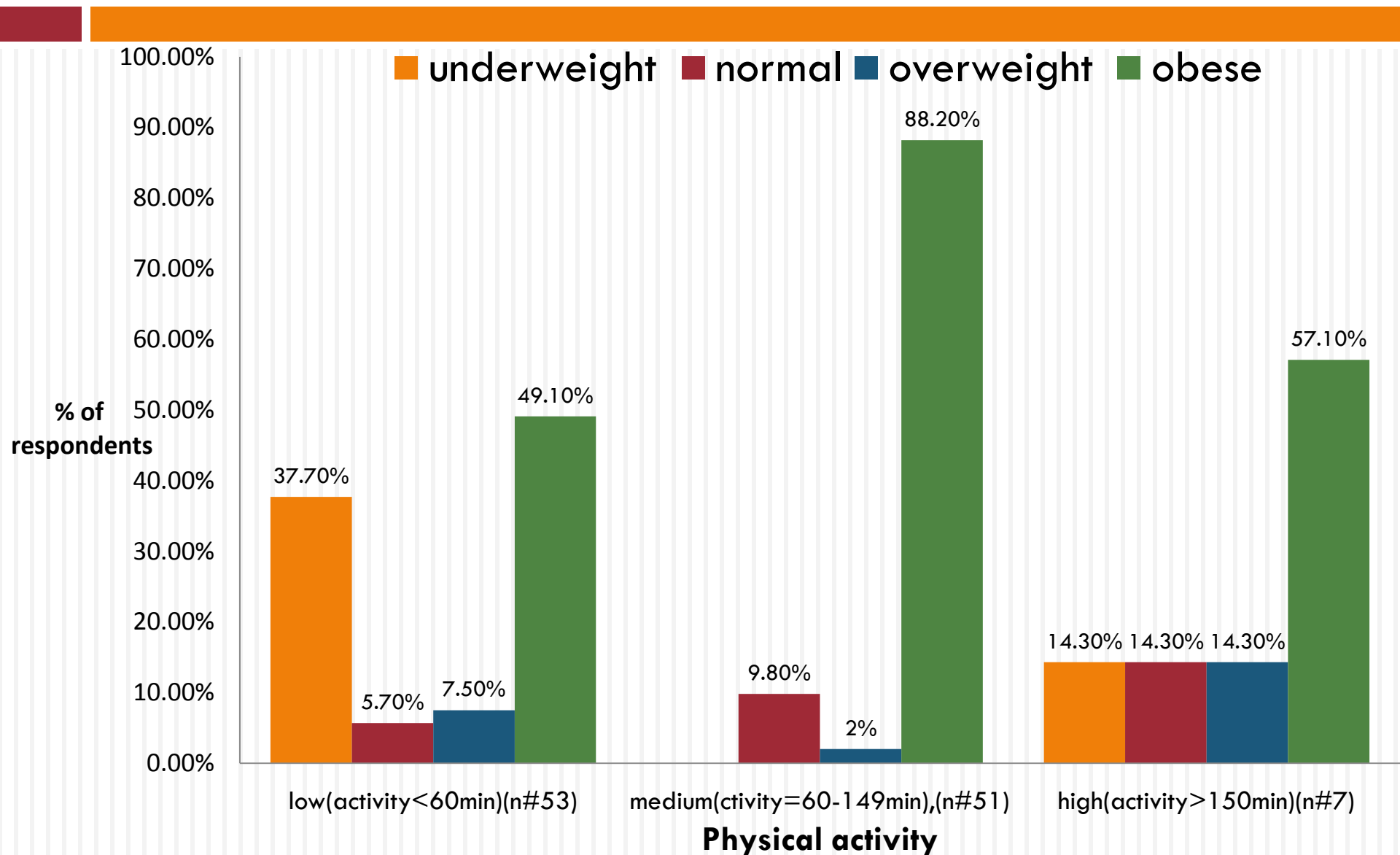
Note

- ❑ $(\text{Weight in Kilograms} / (\text{Height in Meters} \times \text{Height in Meters}))$
- ❑ $(\text{Weight in Pounds} / (\text{Height in inches} \times \text{Height in inches})) \times 703$

Relationship between exercise schedule and BMI categories



Relationship between activeness and BMI categories



Prevalence of Diabetics:

- In the survey people having diabetics was found to be 55 %

Age category		1 (26-30 years)	2(31-35 years)	3(36-40 years)	4(41-45 years)	average	p value (95%CI)
has diabetics	No	100.00%	5.90%	50.00%	30.80%	45.00%	0.000
	Yes	0.00%	94.10%	50.00%	69.20%	55.00%	

Prevalence of cholesterol abnormality:

- Issues of cholesterol imbalances was not found in 91% of respondents

Prevalence of Heart problems:

- Heart problem was not found in 91% of the respondents

Prevalence of Bone Related Problem:

- problems related to bone was present in 53.2% of respondent

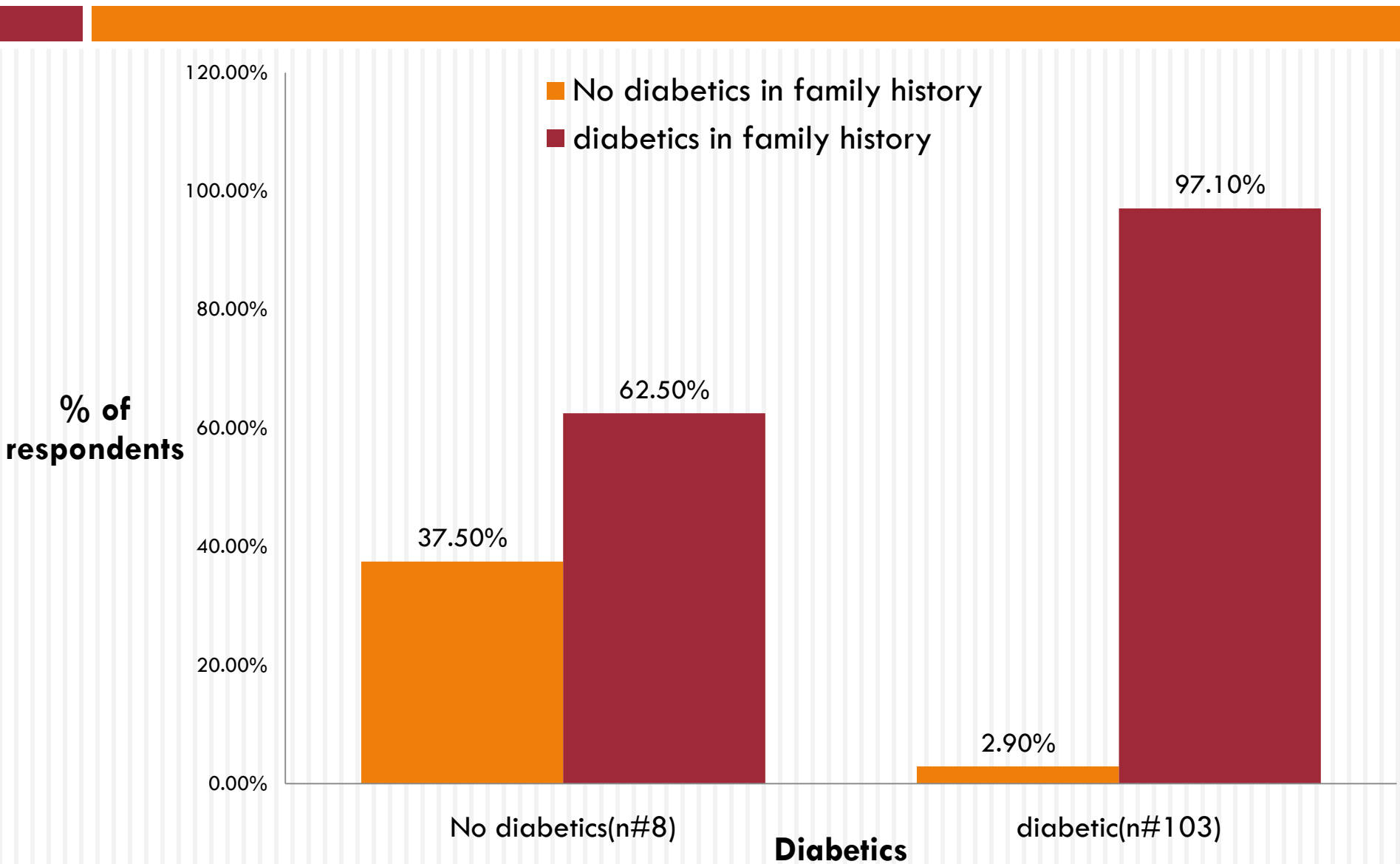
Age category		1 (26-30 years)	2(31-35 years)	3(36-40 years)	4(41-45 years)	average	p value (95%CI)
bone related problem	No	100.00%	7.80%	62.50%	30.80%	46.80%	0.000
	Yes	0.00%	92.20%	37.50%	69.20%	53.20%	

Prevalence of Hyper / Hypotension:

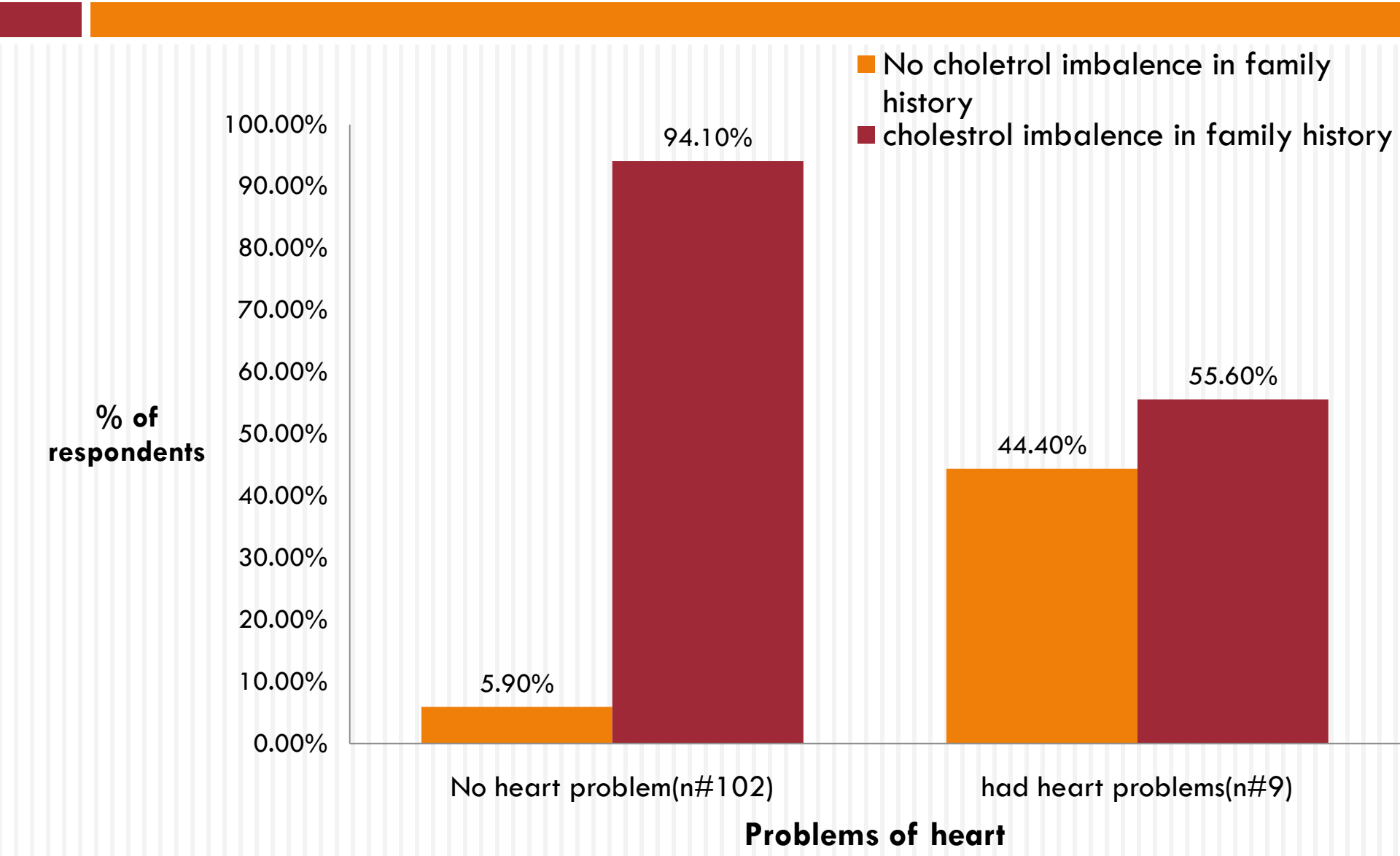
- hyper or hypotension was present in 94.6% number of people

Age category		1 (26-30 years)	2(31-35 years)	3(36-40 years)	4(41-45 years)	average	p value (95%CI)
Hyper/hypo BP	No	0.00%	3.90%	12.50%	23.10%	5.40%	>0.000
	Yes	100.00%	96.10%	87.50%	76.90%	94.60%	

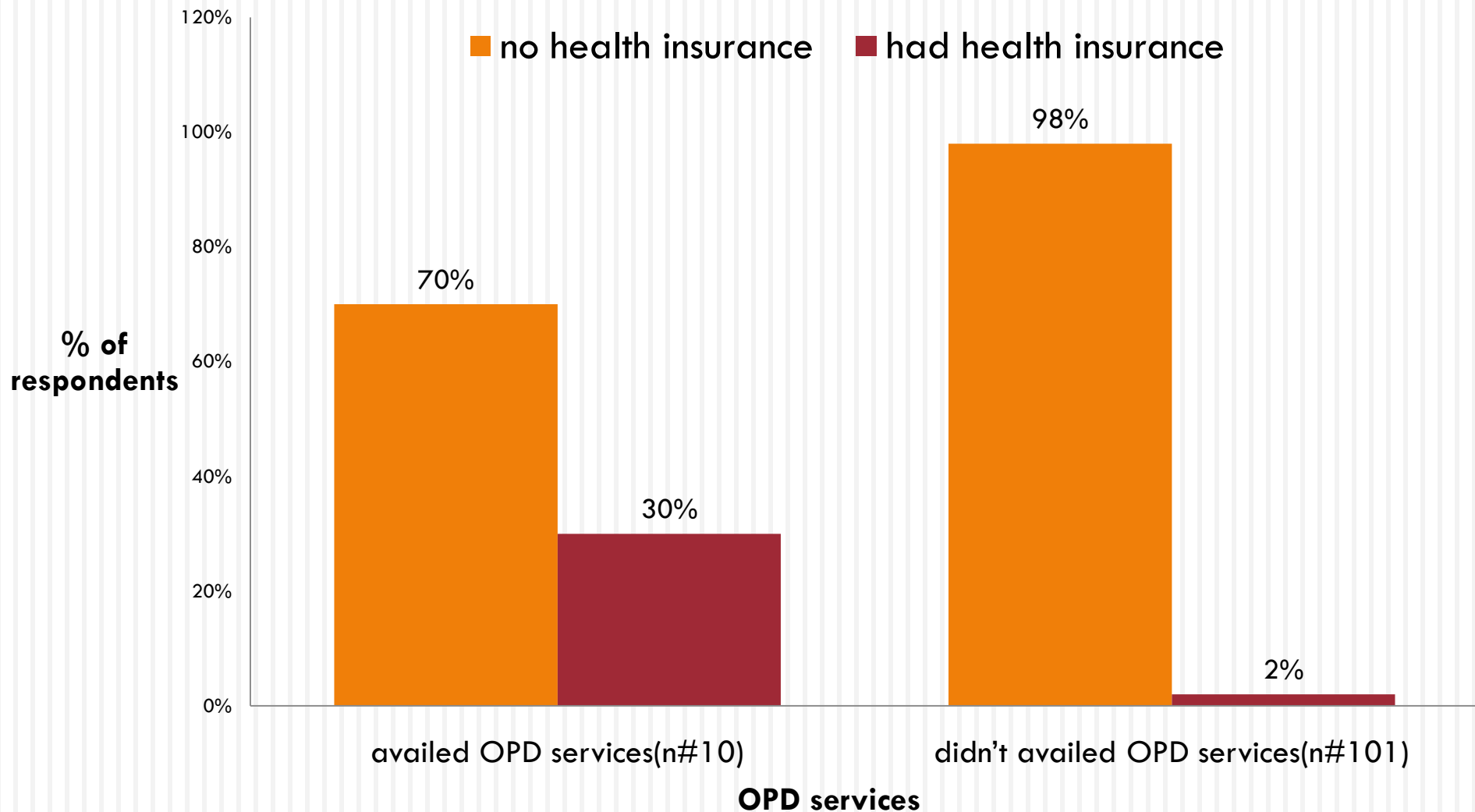
Relationship of family diabetic history and diabetics in respondent



Relationship of family history of cholesterol abnormality and heart diseases in respondent



people who availed OPD services in the last 2 years having uninterrupted Health and medical Insurance which covers hospitalization and domiciliary medical expenses



Odds Ratio

- ❑ An odds ratio (OR) is a measure of association between an exposure and an outcome.
- ❑ The OR represents the odds that an outcome will occur given a particular exposure, compared to the odds of the outcome occurring in the absence of that exposure.
- ❑ The odds ratio can also be used to determine whether a particular exposure is a risk factor for a particular outcome, and to compare the magnitude of various risk factors for that outcome.

When,

- A= Number of exposed cases,
- B= Number of exposed non cases,
- C= Number of unexposed cases,
- D= Number of unexposed non cases.

$$\text{Odds ratio (OR)} = ad/bc$$

RISK FACTORS	ODDS RATIO	CI (95%)
Physical activity	Odds of developing diabetics is 6.533 times more for inactive people as compared to active	1.042 – 40.95
	Odds of developing cholesterol imbalance is 2.047 times more for inactive people as compared to active	1.366- 11.43
	Odds of developing BP problem is 0.900 (OR <1) i.e. in this study physical activity does not come as risk factor for BP levels	0.166- 4.887
	Odds of developing Bone problem is 5.611 times more for inactive people as compared to active	1.505- 62.37
	Odds of developing heart problem is 0.180 (OR<1) i.e. in this study physical activity does not come as risk factor for Heart problems.	0.03-1.103

RISK FACTORS	ODDS RATIO	CI (95%)
BMI	Odds of developing diabetics is 4.571 times more for people having abnormal BMI as compared to normal BMI	1.775- 26.96
	Odds of developing cholesterol imbalance is 4.64 times more for people having abnormal BMI as compared to normal BMI	1.117-19.28
	Odds of developing BP is 1.145 times more for people having abnormal BMI as compared to normal BMI	0.269-4.876

RISK FACTORS	ODDS RATIO	CI (95%)
SMOKING	Odds of developing problems of heart is 1.38 times more for smokers than non smokers.	1.069-2.086
	Odds of developing problem related to blood pressure is 1.15 times more for smokers than non smokers	1.322-4.113
CHEWING TOBACCO	Odds of developing heart problem is 1.603 times more for people chewing tobacco than others	0.114-3.187

Discussion

- ❑ The study showed that the dietary habits of the majority of the respondents were not healthy. Relationship between the behavioural risk factors and occurrence of chronic NCD is well observed in the study
- ❑ Physical activeness increase our life span, regardless of any adverse inherited factors but changes to labour-saving occupations, dependence on cars and buses for transportation, have all led to a sedentary lifestyle and reduced energy expenditure
- ❑ Families have many factors in common, including their genes, environment, and lifestyle. Together, these factors can give clues to medical conditions that may run in a family. Even though we cannot change our genetic makeup, but knowing our family history can help in reducing risk of developing any health problems
- ❑ Health Insurance provides us with the ability to afford better healthcare facilities. The quality healthcare and hospitalization is becoming very expensive nowadays
- ❑ Large hospitalizations cost burden people with huge debt thus presence of having Health Insurance plans help in spreading such a risk to larger no. of people, and hence bring the costs down per person.

Limitations of Study



1. Around 26% of respondents did not provide complete responses for questionnaire.
2. The sampling was convenience sampling.
3. The sampling was done in municipal (MCD) authorized colonies inhabited by middle class and higher middle class families

Recommendations

NCD requires the implementation of multifaceted, integrated initiatives in these key areas

- ❑ **Awareness:** promote a healthy living concept that encourages healthy behavior.
- ❑ **Access:** There is need to expand prevention efforts and primary care availability in urban and rural areas and providing universal access to quality healthcare
- ❑ **Affordability:** There is a need for increased health insurance and expansion of coverage beyond hospital care.
- ❑ **Technology/IT services:** tracking of health conditions and information to ensure more effective monitoring of efforts. They can also use digital and mobile technology to engage patients and increase adherence.
- ❑ Increase awareness on primary health care and prevention by public stakeholders
- ❑ Food based dietary guidelines should be included in the school curriculum from
- ❑ Employers should encourage time off and availability of resources for recreation, healthy menus and use of stairways.

Conclusion

- ❑ In this community-based study, a high burden of Non Communicable Diseases risk factors was observed.
- ❑ Varied degree of association of socio-demographic and behavioural risk factors with biochemical risk factors were seen.
- ❑ Public and private Intervention to prevent and control NCD in our country are not adequate, more is required.
- There is a need to establish a comprehensive strategy to include all the Non Communicable Diseases rather than separate strategies for each disease.
- ❑ Main components that needs to be promoted are: healthy eating, physical activity, a healthy lifestyle, and avoidance of tobacco smoking, and insuring affordability at each steps of health care



Appendix

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Appendix

Questionnaire

Q1. Name: Place of residence:

Q2. Your age:

Q3. Gender: male..... Female.....

Q5. (Family history): Have any of your family members suffered from or are suffering from the following conditions?

- ☐ Diabetes 1.yes 2.No
- ☐ Cancer 1.yes 2.No
- ☐ High Cholesterol 1.yes 2. No
- ☐ Osteoporosis/ Bone related problem 1. Yes 2. No
- ☐ Heart problem 1. Yes 2. No
- ☐ Any other 1.yes 2. No
- ☐ None of the above 1.yes 2.no

Q6. Do you smoke any products such as cigarettes, cigar etc.? 1. Yes.... 2. No....

Q7. Do you use any smokeless products such as chewing tobacco etc? 1.Yes 2.No

Q9. How frequently do you eat fruit? (tick mark the appropriate option)

- ☐ everyday
- ☐ 5 to 6 days in a week
- ☐ 3 to 4 days in a week
- ☐ 1 to 2 days in a week
- ☐ Once in 2 -3 weeks
- ☐ Once in month
- ☐ Never

Q11. Physical activity

- ☐ **What is the level of your physical activity?**
- ☐ Physical activity examples are carrying heavy loads, digging, construction, continuous walking or simple walking which involves your hand and leg movement and makes you tired.
- ☐ Low (avg. <60 min/week)
- ☐ Medium (avg. = 60-149 min/week)
- ☐ High (avg. >= 150 min/week)

Q11. How many days in a month you exercise?

- ☐ 21 to 30 days in a month
- ☐ 11 to 20 days in a month
- ☐ 1 to 10 days in a month
- ☐ Never

Q12. How often you feel mentally stressed?

- ☐ (Stress is a person feeling mentally drained, feeling of things going out of control, not able to manage personal and/or professional life)
- ☐ Frequently
- ☐ Occasionally
- ☐ Rarely

Q13. Height (in meters)..... Weight (in kg)

BMI: Categories:

Underweight = <18.5 , Normal weight = $18.5\text{--}24.9$, Overweight = $25\text{--}29.9$, Obesity = BMI of 30 or greater



Q15. Have you ever suffered from any of the following conditions?

- ☐ Diabetics 1. Yes... 2. No....
- ☐ Higher / Lower cholesterol level 1.Yes.... 2. No....
- ☐ Heart diseases 1. Yes.... 2. No.....
- ☐ Arthritis/bone related problems 1. Yes.... 2.No....
- ☐ Other problem
- ☐ None of the above 1.Yes.... 2.No.....

Q16. From January 2011 to January 2015, did you have uninterrupted Health and medical Insurance which covers your hospitalization and domiciliary medical expenses?

1. YES 2.NO

Q17. From January 2011 to January 2015 have you availed Emergency medical services?

1.Yes 2. No

Q18. From January 2011 to January 2015 have you availed OPD services?

1. Yes... 2.No.....

THANK YOU