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Original Article

A statusof non-communicable diseases among urban population through health camp approach- A novel tool for non-communicable diseases estimation

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Abstract:

Non-communicable diseases (NCDs) are the leading cause of death globally. Of the 57 million global deaths in 2008, 36 million (63%) were due to NCDs, principally cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases.The poor dietary quality (in particular, high salt intake, high saturated and trans-fatty acid intake, and low fruit and vegetable consumption) and insufficient physical activity are key risk factors for NCD development and mortality worldwide and are considered priority areas for international action.340 subjects were included in the study through camp approach. WHO STEPS approach was used to collect the data i.e. questionnaire, physical measures and biochemical investigation by using pretested questionnaire.Among the 340 study subjects who contributed for their investigations were included in this study 282 (82.9%) were females. The majority of 202 (52.9%) were from age of 30-49 years which are the years of social and economical productivity. Majority 228 (67.5%) were from socioeconomic status (SES II & III) which is a essential feature of urban life.Prevalence of tobacco use was 14.41% and of alcohol was 3.8%. Physical inactivity was reported by 61.1%. Only 27.4% and 22.1 % of subjects were consuming adequate portions of fruits and vegetables respectively. Prevalenceof obesity, hypertension, diabetes, and hypothyroidism was 57.64% 4, 38%, 2.9% and 20% respectively.

Keywords: Non-communicable diseases, Camp approach, STEP approach, Obesity, Diabetes mellitus, Hypothyroidism.

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Introduction:

Chronic non-communicable diseases (CNCDs) are reaching epidemic proportions worldwide (1–3).Non-communicable diseases (NCDs) are the leading cause of death globally. It is expected that without effective prevention and control, an estimated 41 million people in lower and middle income group countries will die from NCDs by 2015(4).Based on available trends, by 2020 NCDs are predicted to account for 73% of deaths and 60% of disease burden (5).

The poor dietary quality (in particular, high salt intake, high saturated and trans-fatty acid intake, and low fruit and vegetable consumption) and insufficient physical activity are key risk factors for NCD development (6) and mortality worldwide (7) and are considered priority areas for international action (8).

The second half of 20th century witnessed major health transition in the world, with the improvement of health status and the dramatic decrease in the mortality rates. Among these health transitions, the most globally prevalent has been the rising burden of non-communicable diseases such as cardiovascular diseases, cancer, diabetes mellitus (DM) and respiratory disorders (9). India like other countries also illustrates the health transition which puts non-communicable diseases as a major public health challenge of growing magnitude in twenty first century(10).The pace and process of non-communicable diseases epidemic varies across the country. In India, prevalence of non-communicable diseases is high among urban population (11). Different working conditions and unhealthy lifestyle associated with different services and products exposes urban population to health risk factors which lead to various non-communicable diseases (12).

The current epidemic of non-communicable diseases in India is attributed to increased longevity and lifestyle changes resulting from urbanisation(13).India is experiencing a rapid health transition with a rising burden of NCDs(14).It is important to assess the prevalence of risk factors for NCDs in a community and monitor their trend over a period of time so as to identify areas for intervention as well as evaluate the effectiveness of interventions. Knowing the socio-demographic patterns of non-communicable disease risk factors across urban India it is important not only for predicting the future course of the epidemic but also for planning relevant policies for prevention and disease.

Materials& Methods:

A clinic based participative study was undertaken during January 2012 to December 2012 among adult population of urban health training centre (UHTC) of tertiary care hospital. All male and female natives residing in that urban area for at least 5 years were invited to participate in a general health check up camp and those persons who consented for their participation by contributing charges for their investigations

were included in this study. Participants were excluded if they were pregnant or if they were receiving drugs like lithium or steroids that could interfere with thyroid function tests. Permission of institutional ethical committee was taken before starting the study.The study instrument based on the STEPS approach of WHO was used for data collection which included questions related to socio demographic information, known morbidities, tobacco use, alcohol intake, diet and physical activity. The height, weight, BMI, blood pressure measurements were done at UHTC as per study protocol. Weight was recorded using a standard weighing scale (Krups weighing scale, New Delhi, India) that was kept on a firm horizontal surface. Weight was recorded to the nearest 50 gm. Height was recorded using a measuring tape to the nearest 1 cm. Subjects were requested to stand upright without shoes with their back against the wall, heels together and looking forward. Body mass index (BMI) was calculated using the formula, weight (kg) / height (m^2). A person was considered to be obese if body mass index. (BMI) $\geq$25 kg/m^2 and overweight when BMI $\geq$23 kg/m^2(15).Blood pressure was measured on the right arm in a sitting posture, with the subject in a relaxed state. Standardized mercury sphygmomanometer (Diamond deluxe BP apparatus, Pune, India) with adult size cuff was used. The first appearance of (phase 1 of Korotkoffsounds) sound was used to define systolic blood pressure (SBP). The disappearance of sound (phase 5) was used to define diastolic blood pressure (DBP). Two readings were taken five minutes apart and the average of the two readings was taken as the final blood pressure reading. A person was considered to be a hypertensive if he / she was already diagnosed case of hypertension (HT) and / or on treatment or with a current SBP of $\geq$140 mm Hg or DBP $\geq$ 90 mm Hg (JNC VII criteria)(16). The blood sugar estimation was done by glucometer, and random blood sugar of 200mg/dl was taken as cutoff for diagnosing the person to be diabetic(17).The venous blood sample was taken for Thyroid Function tests and sent to laboratory for further analysis.The TSH estimation was done by the chemiluminescence method using Advia Centaur automated immunoassay analyzer. TSH $\geq$ 5.5 is considered as hypothyroid(18). The study subjects were imparted health education in relation to life style modifications they needed and those in need of referral were referred to tertiary care hospital for further management. The data entry was done in visual basic and analysis was done using Epi-info 7.

Results:

The total 340 people participated in this study of which 58 were male (17.1%) and 282 were female (82.9 %). The mean age of study population was 41.88 years (SD ±13.35).The inclusion of study subjects in this study was voluntary and study subjects were expected to pay contribution for the investigations to know their health status. In total 340 subjects were there in this study.The higher the percentage of female in this study might be due to higher health consciousness among urban female than their male counterpart. Among the study subjects, 119 (35%) were from age group 40-49 years around 83 (24.2%) were from30-39 years of age. This contributes 59.2% of study sample which was representative of socially and economically active group among urbanites. The majority of 129 (37.94%) study subjects were from class III of socioeconomic status (SES) as per Modified Prasad classification followed by 99 (29.11%) study subjects who were from class II. The majority of 220 (64.7%) were from nuclear families, followed by 92 (27.1%) from joint families and 28(8.2%) were from third generation family. When these study subjects were analyzed as per their job profiles, there was an equal distribution among semiskilled 104 (30.58%), unskilled 101(29.70%) and skilled 98(28.82%). The professional (7.35%) and businessman (3.52%) were in minority. Among the study population 125(36.76%) had family history of hypertension while 116(34.11%) were from diabetic families and 32 (9.4%) had family history of hypothyroidism (Table 1).

Table 1: Socio-demographic characteristics of study subjects (N= 340)

Characteristics Gender-	Frequency (%)
Male	58 (17.1)
Female	282 (82.9)
Age (years)	
mean ± SD	41.88 ± 13.35
Age groups (years)	
< 30	55 (16.2)
30-39	83 (24.2)
40-49	119 (35.0)
50-59	47 (13.8)
=60	36 (10.6)
Socioeconomic status (SES)-	
I (above 5546 Rs)	45 (13.23)
II (2773 Rs -5545.44 Rs)	99 (29.11)
III (1663.8 Rs - 2717.54 Rs)	129 (37.94)
IV (831.9 Rs - 1663.24 Rs)	56 (16.47)
V (below 831.9 Rs)	11 (3.23)
Type of family -	
Nuclear	220 (64.7)
Joint	92 (27.1)
3rd generation	28 (8.2)
Job profile –	
Professional	25 (7.35)
Business	12 (3.52)
Skilled	98 (28.82)
Semi-skilled	104 (30.58)
Unskilled	101 (29.70)
Family H/O NCD	
Hypertension	125 (36.76)
Diabetes Mellitus	116 (34.11)
Hypothyroidism	32 (9.4)

Among the study subjects, 83 (24.41%) had NCD like hypertension, diabetes and hypothyroidism. The prevalence of diabetes mellitus was low (2.9 %) as a criterion for diagnosis for diabetes was RBS ≥200 mg/dl and they were the new cases. The total of 15 (4.38%) were found to be hypertensive (BP ≥ 140/90) but 106 (31.17%) had pre-hypertension. The commonest NCD seen was hypothyroidism 68 (20%) were having their TSH ≥5.5 µL/ dl. This high percentage of hypothyroidism among study population might be due to majority of females (82.9%) among study group and majority of 50.9% were from age groups 30-49 years(Table2).

Table 2: Distribution of biological risk factors in study subjects

Biological risk factors	Frequency (%)
BMI -	
< 23	81 (23 .82)
23-24.99	63 (18.52)
25-29.99	134 (39.41)
30	62(18.23)
BP –	
< 140/90	325 (95.61)
=140/90	15 (4.38)
BSL –	
= 200	330 (97.1)
> 200	10 (2.9)
TSH –	
< 5.5	272 (80)
=5.5	68 (20)

Distribution of NCD risk factors:

Among the study subjects, majority 291 (85.58%) were not consuming tobacco and this could be attributed to female majority (82.9%) among the study subjects. Among 49 (14.41%) who were tobacco consumer 33(67.34 %) were male and 16(32.66 %) were females. The majority of 327 (96.1%) study subjects were not consuming alcohol which could be attributed to majority of females among study subjects. Around 205 (60.3%) study subjects were consuming fruits on alternate day while 75(22.1%) were having them daily. Similarly 180 (52.9%) were consuming vegetables on alternate day basiswhile 93 (27.4%) were having them on daily basis. The 60 (17.6%) and 67 (19.7%) of study subjects reported for non-consumptionof fruits and vegetables respectively. The majority of study subjects 209 (61.47%) were not having any daily exercise while 119 (35.00%) wereexercising for less than 30 minutes daily.Only 12 (3.52%) were exercising for as a life style and this needs to be addressed in proper fashion.

Among the study subjects, 63 (18.52%) were having BMI (≥ 23 kg/m^2) i.e. overweight and 196 (57.634%) were obese. The totals of 78.16% study subjects were either overweightor obese. Hence they are at high risk for other NCD. Though only 10 (2.9%) study subjects were having their random blood sugar above 200 mg/dl and were diagnosed as diabetic as per study protocol. This was limitation of this study. Similarly only 15(4.38%) reported to have their blood pressure above 140/90. Though these prevalences are definitely less than or equal to national averages, it can be due to limitation in present study design. As compare to low prevalence of DM and HT among study subjects, the prevalence of hypothyroidism as diagnosed with TSH ≥5.5 was 20% which was definitely higher than national average of around 10%. This high prevalence of hypothyroidism among study subjects could be due to higher percentage of female study subjects (82.9%) and majority were from age group 30-59 (73.0%)(Table3).

Table3: Distribution of risk factors in study population

Risk factors	Frequency (%)
Tobacco consumption -	49 (14.41)
Alcohol consumption -	13 (3.82)
Fruit servings/ wk –	
0	60 (19.7)
3	180 (52.9)
7	93 (27.4)
Vegetables servings/ wk –	
0	67 (19.6)
3	205 (60.3)
7	75 (22.1)
Exercise/ min/ day –	
No exercise at all	209 (61.1)
Upto 30 min	119 (34.6)
More than 30 min	12 (3.53)

Association between BMI and non-communicable diseases like hypertension, diabetes and hypothyroidism was seen. There was 5 times more risk of hypertension, 6.8 times of diabetes and 2 times of hypothyroidism in subjects with BMI ≥25(Table4).

Table4: Association of BMI with Hypertension, Diabetes and Hypothyroidism

BMI	Hypertensive	Non hypertensive	Total	Chi-square -5.412 p- 0.019 OR(95%CI) -5.043
=25	13	183	196	
< 25	2	142	144	
Total	15	385	340	
	Diabetic	Non diabetic	Total	Chi-square -4.417 p- 0.035 OR(95%CI) -6.882
= 25	7	189	196	
< 25	3	141	144	
Total	10	330	340	
	Hypothyroidism present	Hypothyroidism absent	Total	Chi-square -5.830 p- 0.015 OR(95%CI) -2.010
=25	48	148	196	
< 25	20	124	144	
Total	68	272	340	

Discussion:

The present study revealed prevalence of tobacco consumption 14.41% and of alcohol consumption 3.82% which is far less than Anand K et al(14) in their study i.e. 22.2% and 28.9% respectively.

Thankappan K R et al (19)et al found prevalence of unhealthy dietary habits in 39.7%. But we found a high prevalence 72.6% people with unhealthy dietary habit may be due to low female literacy rate leading due awareness of healthy food habits. Similar results were reflected in a study in Uttar Pradesh (20), 61% of respondents were found not to intake of fruits and vegetables.

Gupta et al in a study done in an urban setup reported the prevalence of physical inactivity to be 25.5 %(21).Results varied from our study where inactivity was 61.1% may be because of ignorance towards physical activity. Clara et al (22) observed 16.9% as overweight and 4.4% obese in Andhra Pradesh, which was contradictory to our study results of 18.52%, were overweight and 78.86% were obese individuals. These contradictory results may be due to the people from different socio-cultural backgrounds and middle income and affluent population.

The prevalence rate of hypertension in the study population of Yuvaraj B.Y. et al was 18.3 % (23). We observed hypertension in 4.38% of population in our study. This may be we have taken only those population who have BP$\geq$ 140/90 rather than taking systolic and diastolic BP separately. We found higher prevalence of hypothyroidism in our study where Unnikrishnan A (19)found the prevalence of 10.95%. This higher prevalence of hypothyroidism may be due to use of camp approach of the study. Prevalence of DM in present study was 2.9% which is lower than Deo S et al (24) in a cross sectional study of 1022 individuals of age 20 year and above in rural Malwan area of Sindhudurg district of Maharashtra revealed the prevalence of diabetes as 9.3%. Low prevalence may be due to different setting and use of random blood sugar as criteria for diagnosis of DM.

Mahajan DC et al also reflects similar results in association between BMI and hypertension, diabetes (25). Association between BMI and hypothyroidism showed similar results like Unnikrishnan et al(18).

Conclusion and Recommendation:

Though the prevalence of DM & HT was 2.9 % and 4.38% respectively and 20% prevalence of hypothyroidism among the study population which was definitely higher. Considering poor dietary quality among study population with low consumption of fruits and vegetables and high proportion of study population not doing adequate daily exercises needed aggressive health education regarding life style modifications to prevent further spread of non-communicable disease epidemic in urban population. This suggests a need for aggressive health education in relation to life style modifications needed in this regard.

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