Original Article

Prevalence and Risk Factors Associated with Non-communicable Diseases among Non-teaching Employees in a University : A Cross Sectional Study of Vadodara City in Gujarat, India

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Abstract

Background : Non-communicable Diseases (NCDs) like cardiovascular diseases, cancer, respiratory diseases and diabetes accounted for 80 percent of total deaths in the world. NCDs were more likely among non-teaching employees as compared to teaching employees. So, the current study aims to determine the prevalence of risk factors and their association with NCDs among the non-teaching members of an institutional setup in Vadodara, Gujarat.

Materials and Methods : The research relied on primary source data using a structured questionnaire. Bivariate analysis, Chi-square tests and binary logistic regression were performed using STATA 14 to identify risk factors for NCDs.

Results : Overall, 10.8 percent of the non-teaching staff suffer from at least one NCD in the university. The prevalence of diabetes, cardiovascular diseases, and cancer among non-teaching employees is 8 percent, 3.8 percent and 0.5 percent, respectively. The risk of NCDs is higher among permanent employees (AOR=3.35, 95% CI=1.56-2.59), family history of chronic diseases (AOR= 2.61,95% CI=0.98-2.56), overweight (AOR=9.32, 95% CI=1.63–12.21) and obese employees (OR=17.20, 95% CI=2.24-21.24). The results also showed that the risk of NCDs is increasing with consumption of butter daily (OR: 2.47; CI: 1.25-1.78) and consumption of extra salt with food (AOR:2.51;95% 1.16-2.99), increasing the risk of NCDs. On the other hand, vigorous-intensity activity helps reduce the risk of NCDs.

Conclusion: It is proposed that university administrators develop NCD surveillance systems to better prevention and control. In order to reduce NCD incidence rates and postpone NCD onset, they should take actions to eliminate NCD risk factors and encourage healthier lifestyles.

Key words : Cardiovascular Diseases, Cancer, Diabetes, Prevalence, Risk Factor.

Non-communicable Diseases (NCDs) are one of the major concerns and public health issues in the world[1-2]. Nearly 41 million people die due to NCDs and responsible for more than 75 percent of global death across the world. Around 15 million deaths occurred due to NCDs between 30 to 69 years of age, 85 percent of them were from low-and middle-income countries[1]. Moreover, NCDs like cardiovascular diseases, cancers, respiratory diseases and diabetes accounted for 80 percent of total deaths in the world[1]. India, which has a population of about 1.3 billion, is responsible for more than two-thirds of all NCD-related deaths in WHO's South-East Asia Region (SEAR)[3]. Obesity, raised blood glucose, high BP, high cholesterol levels, physical inactivity, sedentary behaviour, alcohol consumption and smoking behaviour are the major risk factors of NCDs[4-6]. A study based on Ahmedabad city in Gujarat shows the risk factors of teaching employee for the NCDs are tobacco consumption, job stress, physical inactivity, overweight and obesity[7].

Editor's Comment :

- Non-communicable Diseases (NCDs) are significantly prevalent among non-teaching staff in institutional settings, with key risk factors including obesity, unhealthy dietary habits, and physical inactivity.
- Targeted interventions and regular NCD surveillance are essential to reduce the disease burden and promote healthier lifestyles within such populations.

Because more people live in cities and change the way they live, university workers are likely to be at risk for NCDs. To promote health and happiness at work, it's important to figure out how big the risks are for this group. NCDs were more likely among non-teaching employees as compared to teaching employees[8]. So, the current study aims to determine the prevalence of risk factors and its association with

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NCDs among non-teaching members of an institutional setup of Vadodara city in Gujarat.

Materials and Methods

Data :

A primary data was collected using a structured questionnaire. The WHO STEP-wise risk factor surveillance manual (WHO STEP-wise risk factor surveillance handbook, 2017) was used to conduct a situational analysis to evaluate the health condition of university personnel[9]. The institutional Ethics Committee for Human Research (IECHR), Faculty of Family and Community Sciences, Maharaja Sayajirao University of Baroda, Vadodara, accepted the study with the ethical permission number IECHR/FCSC/MSc/2021/101. A cross-sectional survey with 1025 participants (teaching & non-teaching) was done over seven months across fourteen faculties and three colleges of the university[8]. From 1025, we have taken 581 non-teaching employee as a sample for our analysis.

All of the people who took part in the study gave their written permission and were assured that their answers would be kept secret. No one was pushed to take part in the study. A pre-tested questionnaire was used to get specific information about the socioeconomic situation, family history of NCDs, and social and lifestyle risk factors (such as smoking, drinking alcohol, eating habits, level of physical exercise, etc). Anthropometric measures included weight, which was taken with an electric scale, and height, hip and waist circumferences, which were taken with a measuring tape that didn't stretch. The OMRON digital sphygmomanometer was used to measure blood pressure[10]. In person, all measures were taken. Using data on height and weight from physical measures, Body Mass Index was calculated. Participants were then put into[11] underweight, normal, overweight, or obese groups based on Asia Pacific norms[12].

Methodology :

In our questionnaires, we ask three morbid conditions, including medicine consumption: "Has anyone who works at the university ever been diagnosed with heart disease, cancer, lung disease, or diabetes?" NCDs patients don't include people who don't get drugs. To figure out how common NCDs are, we make a "1" or "0" variable out of the set of chronic disease variables. "1" means that an employee has at least one NCD, while a "0" means that an old person doesn't have any NCDs. Finally, we used the logistic regression models to establish the association between the prevalence of NCDs and their contextual determinants.

$$\Pr(yj \neq 0 \mid x_j) = \frac{(\exp(x_j\beta))}{(1+\exp(x_j\beta))} \quad \ldots\ldots\ldots \quad (1)$$

Data obtained were analysed using STATA 14. To show the prevalence and association of NCDs with background characteristics, bivariate analysis along with Chi-square tests has been performed. A p-value <0.05 indicates a significant relationship between the variables.

The independent variable includes socio-economic characteristics, substance abuse behaviour, dietary pattern, physical activity & sedentary lifestyle, and anthropometrics & clinical Characteristics (Table 1).

Results

Prevalence of NCDs among non-teaching employees: The prevalence of diabetes, cardiovascular diseases, and cancer among non-teaching employees is 8.1 percent, 3.8 percent and 0.5 percent, respectively. The overall prevalence of NCDs in the study population was 10.8 percent.

Prevalence and Association of NCDs with Background Characteristics :

Among non-teaching employees, 13% of males and 5% of females were found to suffer from NCDs, with prevalence increasing with age. Permanent employees (21%) and those educated up to HSC (12%) reported higher prevalence. Furthermore, a significant association was found between family history of chronic diseases (17%) and NCDs. Moreover, lifestyle factors such as smoking (14%), tobacco chewing (15%) and alcohol consumption (13%) were linked to higher NCD prevalence compared to their counterparts. Additionally, dietary habits such as frequent eating out, daily consumption of maida (20%), butter (12%), ghee (10%) and regular use of salt with food (18%) were significantly associated with NCDs.

Physical inactivity also contributed to increased prevalence, with non-walkers/cyclists (11%) and those not engaging in vigorous activities (11%) more affected. Furthermore, nutritional status and blood pressure showed significant associations, with the highest prevalence among obese (16%) and hypertensive individuals (14%), compared to overweight (7%), underweight (2%), and normotensive employees (9%). Additionally, employees at risk based on waist circumference (WC) and waist-hip ratio (WHR) showed greater NCD burden.

Determinants of NCDs among Non-teaching Employees :

The logistic regression was used to identify the risk factors associated with NCDs among non-teaching

Table 1 — *Prevalence and risk factors associated with NCDs*

Background Characteristics		[a]Prevalence of NCDs N (%)	AOR [95% CI]
(A) Socio-Economic Characteristics :			
Residence	Gujarat	59(10.7)	Ref.
	Non-Gujarat	4(12.9)	2.03[0.51-2.95]
Sex	Male	54(13.2)	Ref.
	Female	9(5.2)	0.4[0.21-1.71]**
Age Groups	Up to 30	5(5.1)	Ref.
	31-40	8(5.4)	1.04[0.84-0.04]
	41-50	10(6.9)	0.74[0.58-0.38]
	>50	40(21.1)	0.62[0.51-0.57]
Marital status	Married	60(12.4)	Ref.
	Unmarried	3(3.1)	1.02[0.78-0.02]
Education Status	Up to HS	32(12)	Ref.
	More Than HS	31(9.8)	1.12[0.46-0.29]
Type of Employees	Temporary	25(6.3)	Ref.
	Permanent	38(20.5)	3.35[1.56-2.59]**
Family History of Chronic Diseases	No	29(7.7)	Ref.
	Yes	34(16.7)	2.61[0.97-2.96]**
(B) Substance abuse behavior :			
Smoking Behavior	No	58(10.6)	Ref.
	Yes	5(13.9)	1.34[0.38-2.1]
Tobacco Consumption	No	51(10.2)	Ref.
	Yes	12(14.5)	1.24[0.61-0.44]
Alcohol Consumption	No	56(10.6)	Ref.
	Yes	7(12.7)	0.69[0.45-0.96]
(C) Dietary Pattern			
Daily Ghee consumption	No	37(12.6)	Ref.
	Yes	26(9)	0.68[0.27-0.97]
Daily Butter Consumption	No	52(10.7)	Ref.
	Yes	11(11.6)	2.47[1.25-2.78]*
Breakfast	No	6(7.8)	Ref.
	Yes	57(11.3)	1.38[0.75-1.58]
Lunch	No	2(10.5)	Ref.
	Yes	61(10.9)	2.36[2.50-0.81]
Snacks at office	No	29(11.6)	Ref.
	Yes	34(10.3)	1.06[0.39-1.06]
Use of extra salt	Never	43(10.2)	Ref.
	Always/Often	7(17.9)	2.81[1.89-3.53]
	Sometimes	13(10.8)	2.51[1.16-2.99]**
Eating outside meal	Daily	12(15.8)	Ref.
	Weekly	10(21.2)	0.44[0.27-1.29]
	Sometimes	41(11.7)	0.72[0.35-0.66]
Frequency of coarse grains	Never	5(10.2)	Ref.
	Daily	11(17.5)	1.96[1.46-2.9]
	Weekly	23(10.6)	1.1[0.75-1.14]
	Sometimes	24(9.5)	1.09[0.73-2.12]
Frequency of consumption of Maida	Never	23(19.2)	Ref.
	Daily	4(20)	1.78[1.46-0.7]
	Weekly	13(9)	0.32[0.17-2.14]**
	Sometimes	23(7.7)	0.23[0.10-3.22]***
(D) Physical Activity & D. Sedentary lifestyle :			
Daily walking/ bicycle	No	27(11.3)	Ref.
	Yes	36(10.5)	0.61[0.23-1.27]
Vigorous-intensity Activity	No	54(10.9)	Ref.
	Yes	9(10.5)	0.39[0.22-1.65]*
Moderate-intensity Activity	No	53(10.6)	Ref.
	Yes	10(12.5)	2.26[1.31-2.4]
(E) Anthropometrics & Clinical Characteristics :			
Waist Circumference (WC)	At risk	42(11.7)	Ref.
	Not at risk	21(9.4)	1.6[0.74-1.81]
Waist-to-hip Ratio (WHR)	At risk	54(12.1)	Ref.
	Not at risk	9(6.7)	0.97[0.50-1.05]
Nutrition Status	Underweight	1(2)	Ref.
	Normal	13(7.4)	10.13[1.79-13.1]*
	Overweight	7(7.4)	9.23[1.63-12.21]*
	Obese	42(16)	17.2[2.24-21.24]**
Blood pressure	Normal	29(8.6)	Ref.
	Hypertensive	34(13.9)	2.76[1.10-2.54] *
Dyslipidemia Status	No	61(10.6)	Ref.
	Yes	2(25)	3.31[1.11-3.58]
	Total	63 (10.8)	-
	Observation (N)		581
	Pseudo R2	=	0.15

*Note : [a]Row percentage; AOR; Adjusted Odds Ratio; CI=Confidence Interval; * p<0.05; ** p<0.01; *** p<0.001; Ref.=Reference category*

(Table 1). The results showed that the odds of NCD conditions among females (AOR: 0.40; CI: 0.22-1.71) are lower than males. Moreover, the risk of NCDs among permanent employees was 3.35 times higher (AOR:3.35; CI: 1.56-2.59) as compared to temporary employees. Family history of chronic diseases showed a 2.61 times higher risk (AOR: 2.61; CI: 0.98-2.56) of NCDs as compared to those who did not have any history of chronic diseases. In the case of the dietary patterns, the use of butter and extra salt showed significant relationships with NCDs. It showed that the risk of NCDs is 2.47 times higher among those who take butter daily (AOR: 2.47; CI: 1.25-1.78) as compared to those who do not take butter. Similarly, consumption of extra salt with food (AOR: 2.51; CI: 1.16-2.99) increased the risk of NCDs as compared to those who did not consume salt with food. Among anthropometric and clinical characteristics, nutrition status and blood pressure showed a significant relationship ($p<0.05$) with NCDs. The risk of NCDs among overweight (AOR: 9.32; CI: 1.63-12.21) employees and obese employees (AOR: 17.20; CI: 2.24-21.24) is 9.23 and 17.20 times higher as compared to underweight employees. Moreover, the odds among hypertensive employees are 2.76 times higher as compared to normal BP employees.

Discussion

The prevalence of diabetes, cardiovascular diseases, and cancer among non-teaching employees is 8.1 percent, 3.8 percent, and 0.5 percent, respectively. Overall, 10.8 percent of the non-teaching staff suffer

from at least one NCD in the university. The prevalence of NCDs was higher in males. Interestingly, the family history of any chronic disease is significantly associated with NCDs. Employee who has a family history are 2.61 times more likely to suffer from NCDs as compared to employees whose families don't have any chronic disease history. Our finding is similar to a previous study[8].

The prevalence of NCDs is higher among smokers as compared to non-smoker employees. Similarly, it is also higher among people who chew tobacco as compared to those who do not chew tobacco. Moreover, the prevalence is also higher among those who consume alcohol as compared to non-consumers. Our study findings indicate, eating outside meals, daily consumption of maida, butter, and ghee were significantly associated with NCDs. Our study highlights that walking or bicycling and vigorous-intensity activities reduced the risk of NCDs. This finding aligns with previous research[13-14].

Furthermore, the prevalence is highest among obese employees, followed by overweight and underweight employees, respectively. Similarly, hypertensive people suffer more NCDs as compared to normal people[8,15]. Among the socio-economic variables, sex, type of employment, and family history of any chronic disease showed a significant relationship with NCDs. The results show that females are less likely to risk of NCDs as compared to males. On the other hand, the risk of NCDs is 3.35 times higher among permanent non-teaching employees as compared to temporary employees.

Conclusion

The current study examines the prevalence of and risk factors for NCDs among university non-teaching employees. The current study's findings revealed that a family history of NCDs, obesity and overweight, hypertension, daily butter consumption, and taking extra salt raise the risk of NCDs. On the other hand physical activity and a healthy diet can reduced the risk of NCDs. It is suggested that university officials create surveillance systems for NCDs in order to better prevention and control. They should take steps to eliminate NCD risk factors and promote healthier lives in order to lower NCD incidence rates and postpone NCD onset.

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References

1 World Health Organization (WHO) Fact Sheet: Non communicable diseases 2021.https://www.who.int/news-room/fact sheets/detail/noncommunicable-diseases
2 Beaglehole R, Horton R — Chronic diseases: global action must match global evidence. *The Lancet* 2010; **376(9753):** 1619-21.
3 World health organization. *Global status report on noncommunicable diseases 2014.* Geneva, Switzerland: World health organization; 2014
4 Christofaro DG, Ritti Dias RM, Chiolero A, Fernandes RA, Casonatto J, de Oliveira AR — Physical activity is inversely associated with high blood pressure independently of overweight in Brazilian adolescents. *Scand J Med Sci Sports* 2013; **23:** 317-22
5 Tsioufis C, Kyvelou S, Tsiachris D, Tolis P, Hararis G, Koufakis N, *et al* — Relation between physical activity and blood pressure levels in young Greek adolescents: The Leontio Lyceum study. *Eur J Public Health* 2011; **21:** 63-8.
6 Martinez Gomez D, Eisenmann JC, Gomez Martinez S, Veses A, Marcos A, Veiga OL, *et al* — Sedentary behavior, adiposity and cardiovascular risk factors in adolescents. The AFINOS study. *Rev Esp Cardiol* 2010; **63:** 277-85
7 Chhaya J, Devalia J, Kedia G — Prevalence of risk factors and its association with non-communicable disease among the faculty members of teaching institute of Ahmedabad city, Gujarat: A cross-sectional study. *Int J Sci Stud* 2015; **3(8):** 159-62.
8 Kuruvilla A, Mishra S, Ghosh K — Prevalence and risk factors associated with non-communicable diseases among employees in a university setting: A cross-sectional study. *Clinical Epidemiology and Global Health* 2023; **21:** 101282.
9 World Health Organization (WHO). The WHO STEP wise approach to noncommunicable disease risk factor surveillance 2017.https://www.who.int/teams/noncommunicable diseases/surveillance/systems-tools/steps/manuals
10 James PA, Oparil S, Carter BL, Cushman WC, Dennison-Himmelfarb C, Handler J, *et al* — 2014 evidence-based guideline for the management of high blood pressure in adults: Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8). *JAMA Published Online*: February 5, 2014; **311(5):** 507-20. doi:10.1001/jama.2013.284427
11 World Health Organization (WHO). Regional Office for the Western Pacific. (ý2000)ý. The Asia-Pacific perspective: redefining obesity and its treatment. Sydney: Health Communications Australia. https://apps.who.int/iris/handle/10665/206936
12 International Diabetic Federation (IDF). The IDF consensus worldwide definition of The metabolic syndrome 2006. https://www.idf.org/e-library/consensus-statements/60-idfconsensus-worldwide-definitionof-the-metabolic-syndrome.html
13 Kundapur R, Modi B, Shenoy P, Nirmala CJ, Ravi K, Swamy DN, *et al* — Physical activity adaptation towards control of selected noncommunicable diseases-A detailed part of large community trial in rural areas of India. *Journal of Family Medicine and Primary Care* 2022; **11(4):** 1382.
14 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults. Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8). *JAMA Published Online*: February 5, 2014; **311(5):** 507-20. doi:10.1001/jama.2013.284427.
15 Lachat C, Otchere S, Roberfroid D, Abdulai A, Seret FM, Milesevic J, *et al* — Diet and physical activity for the prevention of noncommunicable diseases in low-and middle-income countries: a systematic policy review. *PLoS medicine* 2013; **10(6):** e1001465.