

Research Paper

Occurrence and Responsiveness Level of Common Non-Communicable Disease (NCDs), and its Associated Hazards in Non-Medical Undergraduate Students of Karachi, Pakistan

Ijaz Hayder^{1*}, Waquaruddin Ahmed¹, Shakil Ahmed Dahar²

¹Pakistan Health Research Council, JPMC, Karachi, Pakistan

²Pakistan Health Research Council, DMC, Karachi, Pakistan

*Corresponding Author: Ijaz Hayder (ijaz.hayder.hri@nih.org.pk).

ABSTRACT

The NCDs are responsible for a considerable share of global mortality accounting for 41 million lives annually. These diseases are largely influenced by lifestyle and behavior patterns prevalent in our society, making them potentially preventable. This study, conducted among undergraduate students, involved interviewing 500 participants using a questionnaire comprising 71 questions. Data were entered into SPSS-Ver.23, with categorical variables examined for frequency and percentages, and numerical variables, etc. The findings revealed insufficient awareness and knowledge among the participants regarding NCD prevention. Moreover, the study identified a high pervasiveness of NCD vulnerability among undergraduate populations due to unhealthy lifestyles and behaviors. Addressing NCDs and their risk factors poses an evolving community health task in the country, necessitating targeted interventions with a multi-sectorial approach, particularly among this demographic. Urgent execution of precautionary actions is crucial to mitigate the weight of NCDs in the people.

KEYWORDS: Non-communicable disease, NCDs, Undergraduate non-medical students, Risk factors, Prevalence

INTRODUCTION

Non-communicable diseases i.e., cardiovascular diseases, cancer, chronic respiratory diseases, and diabetes constitute 82% of all NCD deaths. It has been evident there has been a gradual shift from communicable to non-communicable diseases during the last decade. NCDs kill more than 41 million people annually. Approximately, 17 million people die from NCD before reaching the age of 70 years [1]. The prevalence of adult NCDs is highest in South Asia. Alarmingly, a more than 100% increase in the prevalence of heart diseases was reported in Pakistan and India [2,3]. The awareness of the risk factors of NCDs and knowledge regarding the prevention of NCDs was not satisfactory. Therefore, there is a dire need to raise awareness for health education and interventions [4]. Among

these NCDs, Cardiovascular diseases (17.5 million) represent the commonest cause of death followed by cancers (8.2 million), respiratory diseases (4 million), and diabetes (1.5 million) [5]. Shaikh et al. [6] reported that around 70% of students at the medical university were found aware associated with stress, high cholesterol, and obesity as risk factors for hypertension. While as per the research report of Ade et al [7], 63 % of subjects did not identify the stoppage of NCDs. In one recent study, awareness among students concerning the hazards of smoking, alcohol consumption, and physical inactivity was also not up to the mark [8]. Recent PHRC Non-communicable Risk Factor survey reports showed 40% of Pakistanis between ages 18 to 69 have 3 or more risk factors of

NCDs, while this percentage increases to more than 50 % after 45 years of age [9]. In our population, 41.5% are found physically inactive and almost 96 % have fruit and vegetable intake less than the required 5 servings per day, other risk factors like Obesity, tobacco use, fat, and high energy intake are also on the rise. Simple measures suggested by the United Nations that include five priority interventions i.e. healthy diets, tobacco control, low intake of salt, physical activity, lower alcohol consumption, essential drugs, and technologies having better knowledge and awareness of non-communicable disease risk factors could be helpful for better management and prevention of this preventable disease as still there is a paucity of evidence of current knowledge, attitude and behavioral practice related to these ailments among the general public, especially the youth of Pakistan [10].

MATERIALS AND METHODS

Study Design: Cross-sectional study.

Duration of Study: 09 Months

Study Setting: University of Karachi (UoK) and Federal Urdu University of Arts, Science and Technology (FUUAST).

Sample Size: The Sample size was 500 based on the previous study which showed that the knowledge regarding the risk factors of Noncommunicable disease (NCDs) at the 95% confidence intervals and absolute precision of 5 % [8]. The sample size was calculated with less frequency using the Computer Program “OpenEpi Version2 for calculation the sample size.

(<http://www.openepi.com/sampleSize/SSPro por.htm>).

Study Subjects: This study included 500 non-medical undergraduate students from the two major universities of Karachi as mentioned above.

Inclusion Criteria: Those subjects who were present at the study day.

Exclusion Criteria: Those subjects who were absent on that day.

These students willing to participate in the study were enrolled after getting written informed consent. 20 students Per Visit were interviewed with structured questionnaires. Hence there were a total 25 number of Visit for all 500 participants: (25 visits x 20 Subjects per visit = 500 Total Sample size)

Study Instrument:

To evaluate understanding and recognize risk factors and the prevalence of NCDs, a comprehensive structured interview questionnaire was developed following a literature review. The questionnaire, structured in-depth, encompassed 71 questions divided into three sections: Section A contained 16 questions, Section B contained 25 questions (9+16), and Section C contained 30 questions.

Section A consists of 16 questions about the general habit and prevalence of risk factors.

Section B consists of 25 Questions about the baseline knowledge and General awareness related to risk factors and prevention of non-communicable diseases of our concern.

Section C consists of 30 Questions. 10 each for the most common NCDs i.e. Diabetes Mellitus, Cardiovascular Disease, and hypertension to assess the knowledge about these non-communicable diseases, respectively.

After the Interview was completed, 100 Information pamphlets designed for Awareness of NCDs were distributed among the participants so that they may disseminate knowledge to their colleagues and neighbors.

Statistical analysis: Data feeding, and entry were done via SPSS version 23. Frequency and percentages were calculated for categorical variables while mean and

standard deviation were calculated for numerical variables.

RESULTS

General habits and behavioral practices exercised by Participants helped in governing the incidence of predisposing factors for non-communicable diseases. These results are summarized in Tables 1 and 2.

In our study, most of the participants were male (61%) and belonged to middle or low-income backgrounds which is itself the major risk factor for non-communicable disease as mentioned in Table I under father occupations (45% of participants were labor's/Daily wagers offspring, 27% were corporate & 26.9% were government employee's descendants). Most students (51.8%) had a family history of NCDs. Apart from that, overall most of the students were found with poor practice and behavioral risk factors and lifestyles. Mainly the prevalence of addiction in these students was on the rise, 32.2% with either smoking (12.4%), drinking (3.2%), or smokeless tobacco (16.6%). The use of tobacco was significantly associated with gender ($p < 0.01$). I.e. significantly higher ratios of male students were addicted to either smoking or smokeless tobacco.

The highly spicy food was also dominating i.e. 57.8% of participants. Some other risk factors were found to be associated with class differences i.e. unhealthy food practices and less knowledge regarding family history as a risk factor were observed in offspring of laborers/daily wagers probably because of less qualified and illiterate parents. Among these students 42.4% had moderate, 39.6% had little, and 17.8 had hard activity factors. Little activity factor was more prevailing in Govt employees descendent i.e., 33% vs 22.7 and 25.8% in corporate and labor's descendent respectively, while hard activity factors were more observed in laborers' group 21% vs 16% each in other two groups. Only 20.5% loved sports in all as leisure time activity mainly male students (74.8% vs

25.2% females) while the rest of the 75% of students spent time indoors or in physically idle tasks during leisure time. More than half, i.e. 56% had not spared time for exercise or seldom on Sunday if spared.

The use of vegetable and fruit intake was also not appreciable 54.5% intake it once or less than three days a week. In contrast, the use of cold drinks and energy drinks was common i.e. 63.2% of these students, and out of the 28.5% used it even more than 4 days/week. Females however compared to males were more fans of spicy foods and other junk i.e. (fast foods & cold drinks). However, no significant differences were reported regarding another risk factor between these groups.

Most of them (47%) liked paratha at breakfast, 20.4% White bread, 8.6% brown bread and 15.5% did not show any preference in this regard. About 30% showed interest in eating out and a few favored non-vegetarian diets (14.7%), the majority preferred mixed (48.1%) and vegetarian diets (36.6%). Most of them i.e. 54.7% preferred cooking in oil followed by 34.4% Ghee and 10.5 olive oil. The Consumption of fast food was higher at 68% in these subjects 42.7% of students consume 1-3 days per week and 25% consume 4-7 days a week. Despite these practices 90% preferred being smart, 6% liked to be thin, and 4% looked for obesity.

Overall, 44% of students (23.8% male vs. 20.2% females) have an awareness of Non-communicable diseases. Some common NCDs like 81% Diabetes Mellitus, 73% Cardiovascular, and 69% hypertension were correctly recognized. While 37.2% incorrectly declared Cancer as a communicable disease, 27.6% assumed meat as a healthy diet and 35.2 students did not suppose even some smokeless tobacco categories as a major risk factor for these non-communicable diseases. Even about 10% of students considered obesity as a

symbol of healthiness rather than a risk factor.

More than 70% considered this most common non-communicable disease as preventable i.e. In the opinion of 76.6%, 80.4%, and 72.8% of participants; Diabetes, CVD, and Hypertension are preventable respectively. Use of fruits and vegetables and reducing weight which were reported as preventive measures by 37%, 34.7%, 28.3%, 17.4%, and 14.1% respectively, while 27% recommended all above as main preventive measures.

Almost 84% of students (86.4% females vs 82.8% males) were aware of Diabetes Mellitus and raised the level of sugar in their blood, 82.6 % (85.6% females vs 80.7% males) considered High cholesterol and 78.2 % (80 % males vs 75.2 % females) considered tobacco and hypertension as a risk factor for cardiovascular disease. According to 79.4% excessive consumption of fast food and 67 % assumed that high salt consumption is a major risk for hypertension. Approx. 70 % considered aging (Age factor) and family history of NCD as the leading cause of acquiring these ailments.

More than 90% considered obesity as an unhealthy entity while for the rest 10% it was the symbol of healthiness, and even 44% did not consider it as one of the major risks for NCDs. In my opinion, 80% of exercise might have a role in averting these illnesses, while 20% considered it useful for healthy muscles and fitness only.

DISCUSSION

Several risk factors that are prevalent among non-medical undergraduate students have been investigated. There is a considerable lack of awareness among the students, generally, the knowledge of NCDs was unsatisfactory and the preventive measures were not practiced by a significant number of students. The majority of the participants were male (61%) and fell under the low-

middle-income category. Among them 45% were labor's/ Daily wagers offspring, 26.9% were government employees and 27% were businessman descendants [11]. Preventive campaigns and strategic policies are needed to address this population fraction on a priority basis.

Most of the participants were found with behavioral risk factors and lifestyles. The prevalence of addiction in students was on the rise, 32.2% out of which 3.2% were occasional drinkers and 29% were tobacco users either smokers (12.4%) or smokeless tobacco (16.6%). These results vary from the previous community-based survey of PHRC and a study conducted in Karachi [12], wherein the prevalence of tobacco was reported at 19.7% and 45% respectively. In our study usage of tobacco was significantly associated with gender ($p < 0.01$) i.e. significantly higher ratio of male students who were addicted to either smoking or smokeless tobacco.

More family history as a predictor of increased susceptibility to these non-communicable diseases was found in 51.8% (259) participants, where a significant number of subjects reported a family history of Diabetes Mellitus, CVD, Hypertension, and another type of NCDs were 17.3%, 6.4%, 15.3%, and 8% respectively. Even some participants had a family history of more than one NCD. In another study, the prevalence of prediabetes, diabetes, and hypertension in the general population of Karachi had been reported as 40%, 8%, and 18% respectively. In a study conducted on acute coronary syndrome patients, the highest prevalence of diabetes (43%) was reported [13].

In our study, many students were inclined towards physical inactivity, i.e., 39.8% showed little activity factor, and during leisure time, 75% had indoor or physically idle tasks which characterizes sluggishness as a threatening symbol for the progression of NCD. Little activity factor was found

mostly in Govt employees' descendants while hard activity factors were more observed in the laborers' group. Only 20.5% loved sports in all as leisure time activity, with considerably more male students (74.8% vs. 25.2% females), while the rest of the 75% of students spent time indoors or in physically idle tasks during leisure time. More than half (56%) of students do not spare time for exercise or seldom on Sunday if spared. In another study, 58% of participants showed no tendency towards exercise [14].

In our study, almost 84% of students were aware of Diabetes Mellitus and raised levels of sugar in their blood, 82.6% considered High cholesterol, and 78.2% considered tobacco and hypertension as risk factors for cardiovascular disease. The reference point for the normal range of blood pressure amongst the students was 74.5% [15]. Another study reported 70% awareness among students about elevated cholesterol level and overweightness as risk factors for hypertension [16]. Goel and Singh reported 65.3% & 58.3% knowledge about Hypertension and diabetes respectively [17].

The use of vegetable and fruit intake was also not appreciable 54.5% of students ate fruits once or less than three days a week. Despite associated adverse health consequences, consumption of fast foods and use of cold drinks were common lifestyles among university students that are reported as 68% and 63.2% respectively. Contrary to their practices, awareness of aging and fast salty food intake as risk factors were reported as 64.2% and 67.8% respectively while a recent study¹⁹ reported this awareness as 85% and 82% respectively [18].

More than 70% considered this most common communicable disease as preventable in contrast to the previous study where only 37.4% felt that NCDs are preventable while 27% of students considered all of these as main preventive measures against NCDs.

In another study, Chaudhry et al reported awareness of risk factors for hypertension regarding lack of physical activity, obesity, and high salt consumption in the diet as 21.6%, 23.3 and 25.9% respectively, and Obesity as a risk factor was articulated by 38% for diabetes mellitus while aging and family history as risk factors were found as 70% and 51% respectively, which in our study were 59.2% and 60.8% respectively [20]. Obesity as a risk factor was reported by 56% for acquiring NCDs. In another study, conducted by Shivali S. et al. tobacco use and obesity as a risk factor was reported as 54.1% and 60% respectively [21]. However, in our study, more than 90% of participants considered obesity as a risk factor while the rest 10% considered it even the symbol of healthiness. In our study regarding diabetic complications, 70% of the participants knew that Diabetes mellitus can affect other organs while in another study this awareness was 51.5% in the general population and 72.7% in the diabetic population [22].

However, awareness and knowledge levels were not satisfactory and still, the practices and attitudes towards this common group of diseases even had no significant effect and association with whatever knowledge and awareness the youth had. That is one of the reasons, NCDs are categorized as among the top 10 causes of morbidity and mortality in Pakistan, which constitute 77% of age-standardized deaths [23].

In our study, 80% of participants knew the hazards of fast food and smoking but still 32.2% were addicted and 67% consumed fast food. Similarly, 64% correctly mentioned that cold drinks and energy drinks could cause Diabetes Mellitus but still use of cold drinks and energy drinks was more prevailing i.e. 63% of these students [24]. These rising trends of NCDs in our youth have shown their high vulnerability to adopt lifestyles predisposing to NCDs.

CONCLUSION

This study attempted to provide information about awareness level predisposition at a young age, especially among students that

would help policymakers to rethink strategy draw attention to the problem, and direct efforts to curb this epidemic of NCDs in our population.

Table 1: Demographic Properties i.e. age, gender, and father occupations

Demographic Properties	Frequencies	Percentages
<u>Age groups:</u>		
17-20	170	34%
21-24	270	54%
25-28	60	12%
<u>Gender:</u>		
Male	305	61%
Female	195	39 %
<u>Father Occupations:</u>		
Govt. Employees	99	19.8%
Private Job/ Labor	253	50.6%
Own Business	140	28%
Retired/Died	8	1.6 %

Table 2: Frequency of Predisposing Factors for NCDs

Disease	Frequencies	Percentages
Diabetes	87	17.3%
CVD	32	6.4%
Hypertension	77	15.3%
Any Other	40	8%
More than 1 NCD	22	4.3%
Addiction		
Smoking	62	12.3%
Occasional Drinking	16	3.2%

Smokeless tobacco	83	16.5%
Type of Diet	Frequencies	Percentages
Vegetarians	184	36.6%
Non Vegetarian	74	14.7%
Mixed diet	242	48.1%

REFERENCES

- [1]. <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>
- [2]. Sanghera DK (2016) Emerging Epidemic of Non-Communicable Diseases (NCDs) in South Asia: Opportunities for Prevention. *J Diabetes Metab* 7: 647. doi:10.4172/2155-6156.1000647.
- [3]. Siegel KR, Patel SA, Ali MK (2014) Non-communicable diseases in South Asia: contemporary perspectives. *Br Med Bull* 111: 31-44.
- [4]. [Thippeswamy](#) T and [Chikkegowda](#) P. Basic Risk Factors Awareness in Non-Communicable Diseases Study Among People Visiting Tertiary Care Centre in Mysuru, Karnataka . *Journal of Clinical and Diagnostic Research*. 2016 Apr, Vol-10(4): OC04-OC07.
- [5]. Mendis S, Davis S, Norrving B. Organizational update: World Health Organization global status report on noncommunicable diseases 2014; one more landmark step in the combat against stroke and vascular disease. *Stroke*. 2015; 46 (5):e121-22.
- [6]. Shaikh RB, Mathew E, Sreedharan J, Muttappallymyalil J, Al Sharbatti S, Basha SA. Knowledge regarding risk factors of hypertension among entry year students of a medical university. *J Family Community Med* 2011; 18(3):124–9.
- [7]. Ade A, Chethana KV, Mane A, Hiremath SG. Non-communicable diseases: awareness of risk factors and lifestyle among rural adolescents. *Int J Biol Med Res* 2014;5(1):3780–84.
- [8]. Kumar A, Chaudhari, Rami K, Thakor N. Assessment of knowledge regarding noncommunicable disease and their risk factors among students of higher secondary school: an interventional study. *Int J Med Sci and public health* 2016; 5 (1): 115-8.
- [9]. PHRC Sindh and Punjab Non-Communicable disease risk factors Survey of Pakistan 2014-2015.
- [10]. WHO. Non Communicable disease Country Profile 2014. Geneva: WHO, 2014.
- [11]. Beaglehole R (2011) Priority actions for the non-communicable disease crisis. *Lancet* 377: 1438-1447.
- [12]. Global status report on noncommunicable diseases 2010. Description of the global burden of NCDs, their risk factors and determinants. Geneva: World Health Organization; 2011.
- [13]. Khan FS, Lotia-Farrukh I, Khan AJ, Siddiqui ST, Sajun SZ, Malik AA, et al. The burden of non-communicable disease in transition communities in an Asian megacity: baseline findings from a cohort study in Karachi, Pakistan. *PLoS One*. 2) 8; 2013): e56008. <http://dx.doi.org/10.1371/journal.pone.0056008> PMID:23418493.

- [14]. Mohammed Soror Alaithan¹, Mustafa S. M. AbuMuaileq¹, Saja Fadil Jabre, Majd Munir Farajallah^{1*}, Shizana Mirza Rashid¹, Kawthar Ahmed Alabdouli¹¹, Elsheba Mathew, JayakumaryMuttappallymyalil³, Ehab M Eshieba⁴, Aji Gopakumar^{5.2}. Prevalence of diabetes in patients with Acute Coronary Syndrome: A hospital based study, Ajman, UAE: Gulf Medical Journal GMJ, ASM 2014; 3 (S2):S24-S34. GMJ, 6th Annual Scientific Meeting Poster Proceedings 2014. www.gulfmedicaljournal.com
- [15]. Rathi P, Raghuveer P, Narendra V, Bhargava M. Prevalence of Non Communicable Diseases and Its Risk Factors among the Non-Teaching Staff of Medical College using WHO STEPS. *Natl J Community Medicine* 2018; 9(2):71-77.
- [16]. Lorga T, Aung MN, Naunboonruang P, Junlapeeya P, Payaprom A. Knowledge of communicable and noncommunicable diseases among Karen ethnic high school students in rural Thasongyang, the far northwest of Thailand. *Int J Gen Med* 2013;6:519–26.
- [17]. Shaikh RB, Mathew E, Sreedharan J, Muttappallymyalil J, Al Sharbatti S, Basha SA. Knowledge regarding risk factors of hypertension among entry year students of a medical university. *J Family Community Med* 2011;18(3):124–9.5.
- [18]. Goel S, Singh A. Health awareness of high school students. *Indian J Community Med* 2007; 32(3):192–4.
- [19]. Rajarikam Shravani¹, R.L. Lakshman Rao², Md. Abdul Wassey³, Nazia Tabassum⁴. Awareness of Risk Factors for Non Communicable Diseases among Adolescent girls aged 15-17 years in Koti, Hyderabad: *JMSCR* 2018; 6 (4):743-747.
- [20]. Chaudhari AI, Rami K, Thakor N. Assessment of knowledge regarding noncommunicable diseases and their risk factors among students of higher secondary school: an interventional study. *Int J Med Sci Public Health* 2016;5:115118.
- [21]. Shivalli S, Gupta MK, Mohaptra A, Srivastava RK. Awareness of non communicable diseases and their risk factors among rural school children. *Indian Journal of Community Health*. 2013 Jan 31;24(4):332-5.
- [22]. M. Deepa, A. Bhansali, R. M. Anjana, R. Pradeepa, S. R. Joshi, P. P. Joshi, V. K. Dhandhanian, P. V. Rao, R. Subashini, R. Unnikrishnan, D. K. Shukla, S. V. Madhu, A. K. Das, V. Mohan, and T. Kaur⁶. Knowledge and awareness of diabetes in urban and rural India: The Indian Council of Medical Research India Diabetes Study (Phase I): Indian Council of Medical Research India Diabetes 4: *Indian J Endocrinol Metab*. 2014 May-Jun; 18(3): 379–385. doi: 10.4103/2230-8210.131191.
- [23]. Lozano R, Naghavi M, Foreman K, Lim S, Shibuya K, Aboyans V, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2012 Dec 128–2095:(9859)380;15.
- [24]. Park.k. Park's textbook of preventive and social medicine. 24th ed. Jabalpur: Banarsidas Bhanot; 2017. P381.

