Original Article

Healthcare workers at risk: Exploring Non-Communicable Disease factors in a tertiary setting

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Abstract

Background: Noncommunicable diseases (NCDs)/chronic diseases, including hypertension and metabolic disorders, have recently spiked among healthcare workers, possibly due to increased working hours, heavy workload, and a high-stress environment. We conducted a cross-sectional study among healthcare workers to assess the risk factors contributing to the occurrence of NCDs. **Material and Methods:** The study was conducted on 250 healthcare workers. However, 56 participants who already had NCDs were excluded from the analysis. The data was collected in 194 patients using a standardized questionnaire known as "WHO STEPwise". Sociodemographic details and health status of these workers were assessed through screenings, including blood pressure measurements and anthropometry. **Results:** Hypertension was strongly associated with the level of education among healthcare workers, with those having no formal education or only primary education experiencing a higher prevalence. 48% of the workers consumed alcohol, and 13% had a history of drug abuse. Around 39% of these workers had either diabetes or were in a pre-diabetic stage. These workers were also found to be overweight, with an average BMI of 27.4 Kg/m2. Physical activities were less prominent in younger workers compared to 30-40 years' age group workers. Additionally, 71% of the workers consumed excess salt (>5g) in their diet, with only 10% regularly consumed fresh fruits in their diet. **Conclusion:** This research established a positive relationship between the increasing trends of chronic diseases among healthcare workers. Furthermore, it identified risk factors that often go unnoticed and unchallenged until they manifest as serious illnesses.

Keywords: Non-communicable diseases (NCDs); Healthcare workers; Hypertension; Diabetes; Obesity; Body mass index (BMI); Physical activity; Dietary habits; Occupational health.

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Introduction

Due to certain metabolic and hemodynamic changes which our body undergoes corresponding to various factors like genetic, physiological, environmental and behavioral,[1] results in subtle malfunctioning of various organ systems in the body representing as non- communicable diseases. The body's response does not come out to be very evident in early stages and therefore represents only during peak adverse effects and are therefore also known as chronic diseases. Due to this, it has major failures at diagnostic and clinical levels as the diseases shows no or minimum signs and symptoms at acute stages. Hence, they depict the famous Iceberg's phenomenon which explains larger number of cases are sub clinically undiagnosed or unreported therefore, untreated.

In terms of morbidity and mortality, the "BIG FOUR" NCDs- diabetes, cancer, chronic respiratory diseases, and cardiovascular diseases- are widely acknowledged as the main contributors to global health loss.[2] Cardiovascular diseases (CVDs) account for most NCD deaths (17.9 million people annually), followed by cancers (9.3 million), chronic respiratory diseases (4.1 million), and diabetes (2.0 million including kidney disease deaths.[1] NCDs disproportionately affect people in low- and middle-income countries, where more than three quarters of global NCD deaths (31.4 million) occur.[2]

Risk factors associated with these chronic diseases are either (a) Non modifiable such as age associated, gender impacts, genetics etc. or (b) Modifiable. The modifiable risk factors include consumption of tobacco and alcohol, lack of physical activity, overweight and obesity, increased fat and salt intake, low intake of fruits and vegetables, raised blood pressure, raised glucose and raised cholesterol levels which predispose to the development of NCDs.[3]

Healthcare workers who are overburdened in their jobs, under stress and gets no time to focus on their lifestyle are emerging preys of chronic diseases. This sedentary and overstress lifestyle

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impacts the neural coordination to release excess of adrenaline and cortisol, which are responsible for hypertension.[4] Over the top, habits associated with it like overeating, no exercise and poor diet exaggerate the effects. Currently, NCDs are considered as new priorities that put an additional burden on the existing healthcare system of developing countries.[5]

Although non- preventable, if the disease occurs due to modifiable factors, it can be prevented at very early stages by making simple and easy lifestyle changes. This study was done with the purpose of screening healthcare workers at risk of attaining any non- communicable diseases in near future. The core strategy behind this study was to follow a defined questionnaire to screen out the undiagnosed cases of already existing NCD cases or patients at higher risks of developing any NCD in near future. Hence, through this study, we tried creating awareness amongst healthcare workers regarding their current health status and prevent incoming of any disease in near future by taking care of their physical health, dietary habits and routine checkups. Cost-effective interventions for the prevention and control of NCDs can be delivered at in low- resource settings by clinical healthcare workers (HCWs),[6] hence, for this study, the motive lies to prevent non- communicable diseases at primary intervention level so that further consequences can be terminated. For this WHO recommended WHO STEPwise Questionnaire was used.

Materials and Methods

This study is a cross- sectional study which was conducted in the Department of Biochemistry at a tertiary care Centre, Bathinda. A standardized questionnaire as given by WHO called “WHO STEPwise questionnaire” which has 3 steps of screening people at risk of having any NCD in near future. It is an elaborated and coded questionnaire. For convenience and easy understanding of the healthcare workers, this questionnaire was broken down into simple questionnaire and translated into vernacular languages. Consent was taken from each participant which was elaborated in the vernacular language i.e. Punjabi, Hindi and English.

A sample of 250 healthcare workers were taken where all them are working at our tertiary Centre and are resident of Bathinda and nearby villages. Out of which 56 participants were excluded as they were already diagnosed patients of NCDs. The healthcare workers were provided with the thorough knowledge about aim and objectives of the research. They were briefed about the procedure that has to be followed (WHO stepwise questionnaire). Following, a written valid consent was taken before collection of data. Initially, for step 1, demographic details including age, gender, religion, residence, family history of any underlying disease, educational status of the person was collected. Further, the questionnaire helped to collect the behavioural analysis including the alcohol consumption, smoking history, drug abuse, dietary history, physical activities of the person and history of any metabolic disorder such as diabetes, hyper-lipidemia, hypertension etc. In Step 2 and 3, anthropometric calculations for each individual were done separately which included weight, height, waist size and hip size of the individual. BP recording was done using the sphygmomanometer and classified according to JNC-8^6. BMI (body mass index) was calculated from height and weight. For analysis of BMI, South Asia Pacific Guidelines were followed. Biochemical procedures such as taking blood samples, included in Step 3 of WHO STEPs approach was not carried out. The study aims to create awareness amongst healthcare workers regarding their current health status and prevent incoming of any disease in near future by taking care of their physical health, dietary habits and routine checkups.

Results

During this study, 250 study participants were studied and data was collected. Amongst them, 56 were excluded as they had been an existing case of certain non- communicable disease. Out of the remaining 194 participants, complete data was analyzed to reach final result. Out of total 194 samples, major participation was from females (63.4%) and rest was from males (36.5%) Amongst 194 samples, 39% were educated up to primary levels only [Table 1]. 67.3% of them had no past medical history. Initially, socio- demographic details were recorded to know about the education status and idea about the awareness amongst them.

Table 1: Elaboration on the education status of the total participants. Primary education includes education of children up to 11 years of age (class 1 to 5) secondary education includes education of children from 11years to 15 years (classes 6 to 12). Graduation includes completion of at least one complete course after schooling.

Graduation	n(males)	n (females)	total	%
Primary	24	52	76	39.10%
Secondary	16	22	38	19.50%
Graduation	21	34	55	28.30%
More	10	15	25	12.80%

Table 2: Distribution of age amongst the participants

Age	N (males)	N (females)	TOTAL	%
20-30	19	24	43	22%
31-40	34	42	76	39%
41-50	10	29	39	20%
>50	8	28	36	18%

Anthropometric recordings of BMI were taken manually and calculation was done using weight (kgs)/height (m)*2.

Average recording was taken which came out to be 27.4 kg/m*2. The value falls under category of overweight according to national institute of health. BMI was calculated individually and then categorized into various age groups [Table 2 & 3] to analyze the variations in different age groups to determine the physical health in correspondence to age.

Table 3: BMI evaluation corresponding to different ranges. <18.5 kg/m2 represents the underage group, BMI range from 18.5 to 24.9 kg/m2 represents the norma; weihght, range to 25 to 29.9 kg/m2 represents overweight and above 30kg/m2 represents obese category.

BMI RANGE	N	%
<18.5	24	12.37%
18.5- 24.9	36	18.50%
25- 29	112	57.70%
>30	22	11.30%

A positive association was established between education status and hypertension [Table 4, Figure 1]. We found out that majority of the participants with history of hypertension were from lower education. Participants suffering from hypertension were only 34%. Out of which 59% are educated up to primary levels only.

Table 4: Average recording of BP in association with education status to depict awareness and lifestyle owing to high BP levels

Education	n	Avg. systolic	Avg. diastolic
Primary	76	149	85
Secondary	38	126	78
Graduation	55	124.5	74
More	25	126	72

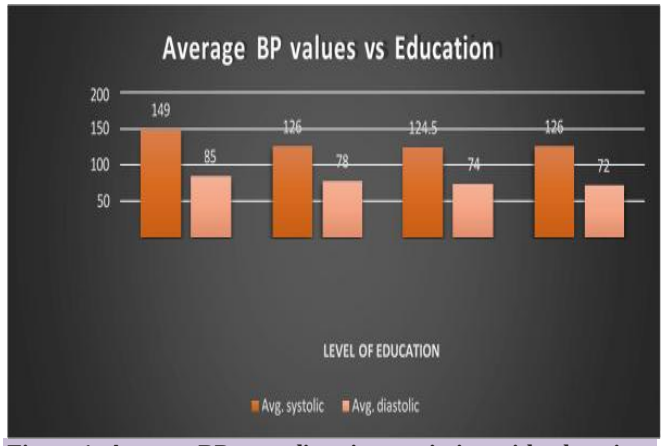

Figure 1: Average BP recordings in association with education.

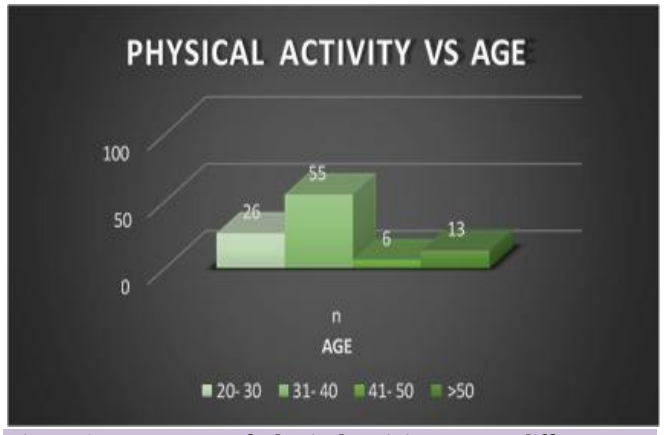

Figure 2: Frequency of physical activity among different age groups

Physical activity which is another key component as described by WHO STEPwise questionnaire which was analyzed by number of hours of working which included heavy work like lifting objects, transportation and including any recreational physical activity was recorded. Ironically, physical activity and exercise in daily routine was more common amongst people in age groups of 30- 40 years in comparison to younger generation in their 20s [Table 5, Figure 2].

Moving on to dietary habits, which included two primary factors: consumption of extra salt in diet which is associated with risk factors like hypertension etc, and addition of fruits and vegetables in their diet. 71% of them were consuming extra salt in their diet and prone to hypertension and other cardiovascular diseases [Table 6, Figure 3]. Lack of fruits and vegetables in their diet elaborates the poor dietary habits and lack of balanced diet [Figure 4].

Table 5: Total number of people involved in physical activity

AGE	n	Total	Percentage
20- 30	26	43	60.00%
31- 40	55	76	72.30%
41- 50	6	39	15%
>50	13	36	36%

Table 6: Frequency of participants including extra salt in their diet

Salt intake	Frequency	Total	Percentage
EXCESSIVE	137	194	0.706
LOW	57	194	0.29

History of diabetes was collected turns out that 39% of total 194 participants were diabetic and showed poor compliance with treatment and periodic investigations [Table 7, Figure 5]. Diabetes is itself a risk factor for various macrovascular diseases (atherosclerosis, peripheral neural disease) and microvascular diseases (diabetic neuropathies, nephropathies and retinopathies).

Figure 3: Frequency of participants including extra salt in diet

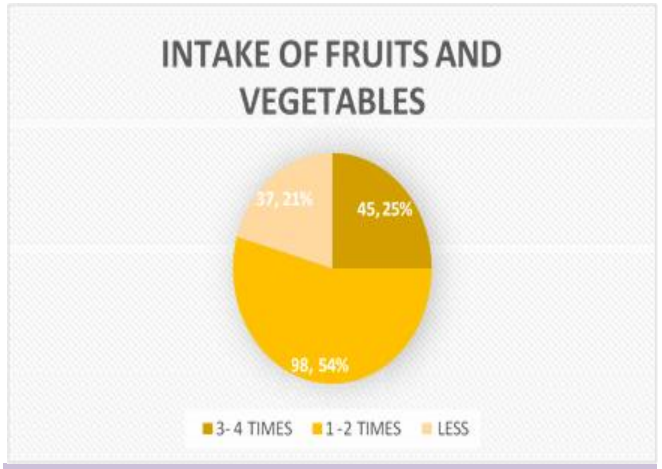

Figure 4: Consumption of fruits and vegetables in their daily diet

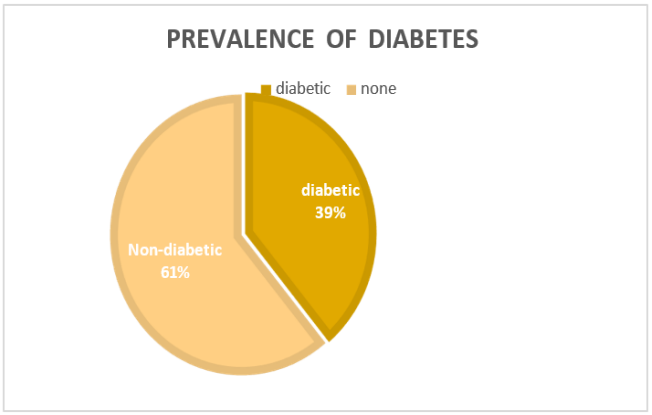

Figure 5: Frequency of diabetes in study participants

Table 7: Frequency of diabetes in study participants

Status	Frequency	Total	Percentage
Diabetic	76	194	39%
Non-diabetic	118	194	61%

Discussion

We were able to conclude that there are various key factors which are responsible for declining health of healthcare staff through emerging prevalence of NCDs. Amongst these, most of the leading key factors sedentary lifestyle and poor diet were leading to adverse consequences like hypertension accounting to the stressful environment and heavy workload. Out of 194 samples, major proportions were females and mostly educated up to primary levels which owes to the lack of awareness about NCDs.

Out of 194 sampling, most of the patients had BMI higher than the normal range (18.5 to 24.9) with the average of 27.4 which puts them in overweight category as given by National heart lung and blood institute [Table 3] (NIHS).[7] This accounts to no or less physical activity along with poor diet which results in higher glucose and cholesterol levels which ultimately leads to pathologies like hypertension, atherosclerosis, diabetes, neoplasms etc. A similar study conducted in Ethopia which uses WHO STEPS to correlate overweight/Higher BMI with prevalence of non-Communicable diseases comes out to be 21% of total samples were suffering from hypertension and high cholesterol levels were overweight.[8] while this study found out 57.7% [Table 3] overweight and at high risk of hypertension and its related consequences.

Proper balanced diet, stress free environment and daily lifestyle changes will help us to reduce the incidence and number of deaths occurring due to NCDS. It includes quit smoking, alcohol abuse, exercising daily for 15- 20 mins, eating balanced diet free from saturated fats, high sodium contents and excessive carbohydrates and food rich in fiber and vitamins.

Higher BMI value can also be a major factor accounting to the higher risk factors of these disorders. No significant dyslipidemia has been recorded. Although, this may be due no significant lab recordings in the past. On account of these findings, awareness about the lifestyle changes and core dietary habits are made and will be continued. People at higher risk were also be referred for the checkups for its management.

We also concluded that the prevalence of various risk factors was higher with low literacy levels. Following JNC*8 guidelines, which advices to start treatment for general population at BP 140/90 mm of Hg. As seen, chances of hypertension were higher in the hospital staff with primary education only. The results were in similar patterns of the published article by Naveen Khargekar, in May 2021.[9] BP recordings taken in their work hours, showed wide variations. Generally, staff appointed in the heavy OPDs and Emergency wards had higher values due to work stress and anxiety. Family history of hypertension was very common. Patients at higher risk of hypertension and diabetes should

consult doctors immediately to start medications as soon as possible.

The major shift in diabetic prevalence from age group of >50 years to age group 30- 40 years have been seen as the most cases were from early age groups is very alarming and can be major risk factor associating to prevalence of NCDs in future. According to American diabetic association, confirmatory diagnosis of diabetes is A1C >6.5, FBS >126mg/dl, 2-h PG ≥200 mg/dL, RBS >200mg/dl with classic symptoms. If this criterion is not followed, the patient remains undiagnosed with adverse consequences like diabetic nephropathy, neuropathies and retinopathy (microvascular) and macrovascular consequences like CAD, atherosclerosis etc.

According to JNC * 8 guidelines, in patients with hypertension and diabetes, pharmacological treatment should be initiated when blood pressure is 140/90 mm of Hg regardless of age.

Smoking and alcohol consumption turned out to be almost nil as compared to the national average of 40%.[10] Along with this, patterns of dietary habits like lower consumption of fruits and higher salt level in their diet puts them at great risk of developing hypertension and various renal disease.

Dietary habits which include extra salt in daily meal of 194 sample size came out to be 70.7%. comparing it with a similar study where 967 sample size was taken and outcome of participants consuming extra salt came out to be 87.9%. The variation noticed could be due to sociodemographic differences. This study was done at location Bathinda, Punjab whereas the referred study is from Uttar Pradesh.

Conclusion

This study highlights the growing burden of non-communicable diseases (NCDs) among healthcare workers, emphasizing the significant role of modifiable lifestyle factors. Overweight and obesity, inadequate physical activity, excessive salt intake, poor dietary habits, alcohol use, and low fruit consumption emerged as important contributors to the risk of hypertension, diabetes, and other chronic illnesses. Furthermore, lower levels of education were associated with a higher prevalence of hypertension, suggesting a lack of awareness and preventive practices. Targeted health promotion, regular screenings, and lifestyle interventions are crucial to reduce NCD risk among healthcare workers. Addressing modifiable factors will improve their well-being, strengthen patient care, and support the overall healthcare system.

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Conflicts of interest

There are no conflicts of interest.

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