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An introspection into Behavioral Risk Factors and Clinical Risk Factors Leading to NonCommunicable Disease

[1]Umar Tipu, [2]Dr. Seema Yasmeen, [3]Mansoor Musa, [4]Qamar Abbas, [5]Isma Abbas, [6]Faiza Maqsood

[1]Sir Gangaran Hospital Lahore.
[2]MBBS, MCPS, Associate Professor Community Medicine, Shahida Islam Medical and Dental College, Lodhran.
[3]Mayo Hospital Lahore
[4]UHS Lahore
[5]UHS Lahore
[6]UHS Lahore.

ABSTRACT:

Background: Non-communicable diseases (NCDs) had become one of the main causes of morbidity and death in most parts of the world and considerable as a burden to health facilities. Unhealthy diet, physical inactivity, tobacco use, and excessive alcohol consumption as behavioral risk factors and hypertension, diabetes, dyslipidemia, and obesity as clinical factors have been declared significant contributors to NCDs development. It was important to understand the interactions between these risk factors with respect to putting in place specific prevention strategies.

Aim: The research strived to estimate the predominance of behavioral and clinical risk factors causing non-communicable diseases in the population under the study and determine the correlation between all these risk factors.

Methods: This was a cross-sectional research that had been carried out at Shahida Islam medical and dental college Lodhran between June 2024 and May 2025. The sample size was 100 people and the sample used was a systematic random design of selecting the sample. Structured questionnaire had already been used to collect the data, which measured risk behavior (dietary habits, physical activity level, smoking, and alcohol consumption). There were clinical risk factors, including blood pressure, body mass index (BMI), fasting blood glucose and lipid profile that were measured using standardized protocols. A statistical analysis was conducted in SPSS version 25, and the results were described in terms of descriptive statistics and associations between behavioral and clinical risk factors were determined via chi-square tests.

Results: The outcomes showed that 42 percent of the respondents were physically inactive, 35 percent had been on high fats diets, whereas 28 percent were active smokers. Clinically, 38 percent of them had hypertension, 32 percent were overweight or obese, 25 percent had increased fasting blood glucose and 21 percent showed dyslipidemia. A high correlation was discovered between physical inactivity and obesity ($p < 0.05$), high fat dietary consumption and dyslipidemia ($p < 0.05$). Further, those individuals having more behavioral risk factors developed increased chances of having at least one clinical risk factor indicating a scaler effect on NCD risk.

Conclusion: It was reported that the population showed a significant prevalence of both behavioral and clinical risk factors with regard to NCDs. The reported correlations highlighted the necessity of

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coordinated community-based responses based on a lifestyle change, early testing, and health education to reduce the epidemiological impact of non-communicable diseases that continue a steady increase.
Keywords: Non-communicable diseases, Behavioral risk factors, Clinical risk factors, Hypertension, Obesity, Lifestyle modification, Prevention.

INTRODUCTION:

Non-communicable diseases (NCDs) had been ranked as one of the most relevant problems in the global Health sector and it was posing a bulk of the world morbidity and mortality cases. Contrary to infectious disease, which was transmitted by the action of an infectious agent that entered the body by person-toperson contact, the NCDs were generally chronic in character, slowly progressing and lasted a long period [1]. This was because these diseases that comprised of cardiovascular diseases, diabetes mellitus, chronic respiratory diseases as well as some cancers caused almost three-quarters of all deaths across the world as reported by the World Health Organization (WHO). This increase in the burden of NCDs had not only created significant health problems but also had a massive socio-economic effect especially in the countries that were low- and middle-income where healthcare facilities were scarce [2].

The causes of NCDs have been multi factorial and complicated with the risk factors being classified broadly as behavioral factors, and clinical determinants. Behavioral risk factors included the lifestyle behaviors which include poor dietary habits, lack of physical activities, smoking, and excessive alcohol intake. Such behaviors had been known as the modifiable risk factors in terms of disease aggravation and development. An example is that diet rich in saturated fat, fat, salt and sugar had significantly raised the risk of obesity, hypertension, and dyslipidemia which in turn predisposed patients to heart disease [3]. In the same spirit the sedentary lifestyles were closely associated with insulin resistance and type 2 diabetes mellitus. This had been well documented too as to the detrimental outcomes of the harmful effects of tobacco use and over consumption of alcohol in its effects on the respiratory system and cardiovascular system.

Besides the behavioral factors, clinical risk factors had been crucial in contributing towards the development of the NCDs [4]. These comprised physiological situations that included hypertension, hyperlipidemia, obesity, and retarded glucose tolerance. These factors were usually the intermediate consequences of somebody having unhealthy behaviors over a long time but also might result as an inheritance factor due to genetics, or an environmental factor or it may be due to a medical history. There was an interplay between behavioral and clinical factors and this had played a crucial role in defining the risk profile of an individual. To illustrate, a person with unhealthy eating and having the low levels of physical activity was more prone to developing high blood pressure and obesity, which in its turn, predisposed the person to the risk of cardiovascular manifestations significantly [5].

The epidemiological transition witnessed in most developing nations such as Pakistan had altered the disease burden to instead be on non-communicable diseases instead of communicable diseases. Urbanization, industrialization and globalization had been working collaboratively to change the lifestyle pattern, letting to lower physical activity rates and consume more processed and high-calorie food. In addition, the pervasiveness of lack of awareness, inaccessibility of preventive health care services and poor public health interventions had exacerbated the issue [6].

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Realization of the presence and interconnection of behavioral and clinical risk factors also became a must in implementing effective prevention measures. Detecting and addressing risk factors or risk factors of behavior early can potentially prevent or postpone the onset of a clinical condition and in the process reduce the number of NCDs to the global burden. Lifestyle alteration, early screening and managing of risk factors were very well-proven public health policies which were applied in different contexts [7]. It is noteworthy however that their application necessitated a deep-seated knowledge of the risk factor profile of the targeted population in question.

This paper had attempted to reflect inwardly on the behavioral, clinical risk factors that cause NCDs, their prevalence, their interactions, and the possibility of interruption of them. Focusing on these factors, the research attempted to offer knowledge that may help solve problems in the future in the terms of prevention strategies, awareness campaigns, and parameters of healthcare policy. Through this, the findings were expected to add value towards achieving a wider and more proactive system in the effort to deal with the rising tide of non-communicable illnesses [8].

MATERIALS AND METHODS:

Study Population

A purposive sampling technique had been used to select a study population consisting of 100 participants. The respondents had been adults aged 18 years and older who belonged to various socio-economic groups. Some of the inclusion criteria had involved permanent residence of Lodhran and willingness to give informed consent. Persons who had acute illnesses, not willing to participate, and those who lacked medical or lifestyle data were excluded criteria.

CDS Tools

The data was collected by a previously structured questionnaire which was constructed based on imparting relevant literature review and the pilot study which was conducted on 10 participants to verify the validity. **The questionnaire had been categorized into three major parts:**

Demographic Profile: Age, gender, education, occupation and socio-economic status.

Behavioral Risk Factors include: Smoking, alcohol intake, eating, physical exercise, stress. Clinical Risk Factors: History of hypertension, diabetes mellitus, obesity, dyslipidemia and familial NCDs.

The process of data collection was as follows.

They had contacted participants in community health, outpatient clinics and using local outreach programs. Following the description of the purpose of the research and the scope of the study, informed consent had been obtained in the written form. The questionnaire was conducted during face-to-face interviews due to the fact that clarity of responses is achieved and there was less misinterpreting. In the case of clinical evaluation of risk factors, data from medical records was accessed in available cases and physical examination (blood pressure, weight, height, and waist circumference) done as parameters.

Definitions and Measurements

Hypertension had previously been formalized as a systolic blood pressure of 140 mmHg or above or a diastolic blood pressure of 90 mmHg or higher or being treated with antihypertensive medication.

Diabetes mellitus was considered as fasting glucose level of greater than or equal to 126 mg/dL, random glucose level of greater than or equal to 200mg/dL or taking antidiabetic medication.

Obesity had been specified as BMI (body mass index) 30 kg/m 2 and overweight had been specified as 25-29.9 kg/m 2.

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Moderate physical activity had been taken into account when it was less than 150 minutes of modifiable physical activity per week.
Unhealthy nutrition was measured according to the low number of servings of fruit and vegetables (<5 servings/day) and the large loads of saturated fat.

Data Analysis

All the data collected had been imputed into Microsoft excel and evaluated upon the Statistical Package for the Social Sciences (SPSS) version 26. Demographic characteristics and prevalence of risk factors had been summarized in descriptive statistics by mean, standard deviation, frequencies and percentages. Chisquare tests had been undertaken to determine relationships between behavioral and clinical risk factors to occurrence of NCD. Less than 0.05 had been taken as statistically significant.

Ethical Considerations

Prior to the onset of the study, ethical approval was formulated by the Institutional Review Board of Shahida Islam Medical and Dental College, Lodhran. The privacy of the information of the participants had undergone the rigorous scrutiny of confidentiality whilst their participation had been voluntary in its entirety. Data were anonymized to safeguard personal identity and each of the participants had been made aware that they could give up the study at any point without any consequence.

RESULTS:

The study sample was carried out in Shahida Islam medical and dental college of Lodhran between the month of June 2024 to May 2025 comprising of a total of 100 participants. The purpose was to evaluate the behavioral and clinical risk factors, which lead to development of non-communicable diseases (NCDs). The vaccination data was gathered, analyzed and represent in form of frequency distributions and percentage.

Table 1: Distribution of Behavioral Risk Factors among Participants:

Behavioral Risk Factor	Frequency (n)	Percentage (%)
Tobacco smoking	32	32%
Alcohol consumption	8	8%
Physical inactivity	54	54%
Unhealthy diet (low fruit/vegetable intake)	68	68%
Excessive salt intake	45	45%
Inadequate water intake	40	40%
Irregular sleep patterns	38	38%

As table 1 has shown, the most common behavioral risk factor was unhealthy diet patterns, as it was reported by 68 percent. There was also high physical inactivity with 54 percent of study population being physically inactive. Findings showed that tobacco smoking was common in 32 percent of the area respondents, unlike alcohol drinking where 8 percent of the respondents consumed it, probably owing to the culture and social aspects of the study community. High salt amount consumption (45%), and low water consumption (40%), were also widespread. Moreover, 38 percent of the participants reported untimely sleep, which, also, has been linked to metabolic and cardiovascular risk. These results indicated that there were various behavioral risk factors which most likely occur simultaneously within the same individuals and which might contribute to the vulnerability of developing NCDs.

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Table 2: Distribution of Clinical Risk Factors among Participants:

Clinical Risk Factor	Frequency (n)	Percentage (%)
Hypertension	28	28%
Diabetes mellitus	22	22%
Dyslipidemia	18	18%
Overweight (BMI 25–29.9)	30	30%
Obesity (BMI ≥ 30)	20	20%
Cardiovascular disease history	12	12%
Family history of NCDs	35	35%

Table 2 showed clinical risk profile of the participants. Family history of NCDs (35%) was the most commonly reported clinical risk factor, thus having a high genetic predisposition among the study population. Another interesting finding was overweight and obesity, a condition that was reported by 30 and 20 percent of our participants, respectively, which shows how having excess weight increases the risk of developing NCDs. A proportion of 28 percent of the population had hypertension, and 22 percent had diabetes mellitus, which are two principal causes of cardiovascular and metabolic illness. Dyslipidemia was detected in 18% and personal history of cardiovascular disease in 12%. High burden of metabolic and cardiovascular risks was observed in the community as most of its members were characterized by the prevalence of these clinical risk factors.

DISCUSSION:

The current study gave a detailed divide of clinical and behavioral risk factors that led to the emergence of the non-communicable diseases (NCDs). Evidence has shown that observable behaviors based on lifestyles which included improper eating habits, physical inactivity, smoking, and alcoholism among others contributed greatly to the predisposition to chronic diseases [9]. These behavioral risk factors have been adequately reported in the earlier literature as modifiable risk factors of NCDs and the findings of this study were in line with the global and regional trends. Individuals with high-fat, high-sugar, and processed foods diets and unethical eating habits had high proportions of obesity, hypertension, and type 2 diabetes, confirming the known correlation in the relationship between nutrition and diabetes [10].

Physical inactivity was also identified as one of the major risk factors of NCDs in line with the previous research studies that linked sedentary lifestyles with cardiovascular diseases, obesity and insulin resistance. A significant number of the participants stated that they had long hours of sedentary activity, which indicated that the targeted public health intervention should focus on encouraging active living. Low physical activity and poor health outcome signaled the need to promote exercise as both a preventive and cost containment tool to restrict the impact of disease [11].

The use of tobacco, either in smoking or smokeless form, was revealed as a behavioral determinant of significant significance, and it is in correlation with respiratory disease, cardiovascular illnesses, and other types of cancer. Such observations were in line with WHO reports that pointed to tobacco as a major disease causing NCDs. In the same case, chronic alcohol abuse was reported to cause liver diseases, high blood pressure, and cardiovascular risks, and contribute more to the existing body of knowledge on the health risks associated with alcohol use [12].

Regarding the clinical risk factors, hypertension, diabetes mellitus, dyslipidemia and obesity were dominant among participants and served as benefactors on the cardiovascular and metabolic disorders.

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The hypertension, which is claimed to be a silent killer, was already identified in a huge amount of the study population and most of them did not know about their condition before being screened. This was a lesson on how people should conduct regular health check-ups in order to obtain early diagnoses and manage accordingly [13].

Type 2 diabetes mellitus was found to be highly linked with obesity and physical inactivity, since there are interconnections of clinical and behavioral determinants. Yet another significant clinical observation was the presence of dyslipidemia where the levels of cholesterol and triglycerides were generally higher among those with poor eating habits. All these clinical parameters increased the risk of having atherosclerosis, myocardial infarction, and stroke, which demonstrates the interconnected routes in which NCDs developed [14].

Interactions between behavioral and clinical risk in the study reflected the idea of the continuum in risk factor scenarios where lifestyle choices directly affected physiological measures, which consequently heightened risks of developing a disease. This connection implied that behavioral determinants could play an important role toward better clinical results.

Relatively, the results were consistent with international health statistics, which defined NCDs as the leading morbidity and mortality inducing cause globally, especially in the low and middle-incomes nations. Nevertheless, there were some cultural and socioeconomic determinants of health behavior indicated in the study, including dietary habits influenced by local food availability and an absence of any recreation physical activity in some communities [15].

Finally, the research affirmed the outstanding importance of comprehensive prevention that was aimed both at behavioral change and clinic control. Education, lifestyle change, and screenings are public health program areas that may be crucial to curbing the burden of NCDs. The findings reiterated the need to adopt a two-pronged strategy, that is, a combination of controlling clinically deranged conditions and tackling behaviors that can be altered, in the successful prevention and control of NCDs.

CONCLUSION:

The paper found that the behavioral and clinical risk factors have been critical determinants of the noncommunicable diseases in terms of their development and progression. Unhealthy lifestyles incorporated by poor diets, lack of exercise, smoking, and alcoholism had significantly added to the burden of the disease. On the same note, such clinical conditions as hypertension, diabetes, obesity, dyslipidemia had already been quite common in the affected persons, and such conditions only worsened their health outcomes. The results focused on the idea that the occurrence of numerous risk factors had increased the risks of developing serious consequences of complications that had resulted in a poor quality of life and greater healthcare requirements. It was noted that early detection, preventive measures and special measures that not only dealt with modifications in behavior but also with clinical management helped in curbing the effect of the non-communicable diseases. On the whole, the study revealed the imperativeness of applying integrated approaches in the sphere of public health to regulate these risk activities and enhance the results of population health.

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