Research Paper

Identifying Life-Style Risk Factors Of Metabolic Diseases Among Adults: A Descriptive Survey Analysis

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ABSTRACT

Introduction

The burden of metabolic diseases is global in its nature there a few diseases which are escalating in its nature and hence through that healthcare measures are required not only to treat them but in the first place to identify the population who are at risk, therefore it is the need of the hour that prevention should be the focused aspect among these countries so as to cater to Lifestyle modifications.[1]

Aim

Hence aim of the study was to identify the life-style risk factors of metabolic diseases among adults and to associate the findings with selected demographic variables. A non-experimental descriptive research design was adopted with a quantitative research approach.

Methodology

An exploratory study design which was quantitative in its approach was used as study design & non-probability purposive sampling technique was used to select 100 samples for the study. The study was conducted in geographically distributed four regions of selected areas of Pune city, and the population comprised adults aged 18–60 years residing in these areas. Data was collected using a structured questionnaire to assess lifestyle risk factors of metabolic diseases along with demographic variables. The collected data were analysed using descriptive and inferential statistics.

Results

The study findings revealed that scores ranged from 0 to 10, with 73% mild risk for Life Style indicating mild risk. Average Risk score is 4.0. Mild to moderate lifestyle risk, reflecting an emerging concern for lifestyle-related conditions. Scores ranged from 0-22, with 51% low risk for diabetes indicating mild to moderate risk in most. Scores ranged from 0-22, with 51% low, high risk for diabetes indicating mild to moderate risk in most.

Conclusion

Adults in the selected areas face multiple lifestyle-related risks, highlighting the need for preventive strategies and health promotion.

Key Words: Lifestyle risk factors, Metabolic diseases, Adults, Diabetes mellitus, Cardiovascular diseases.

Research Paper

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INTRODUCTION

Metabolism is a vital process that enables the body to convert food into energy required for normal growth and functioning. When this process is disturbed, metabolic disorders may develop due to improper breakdown and utilization of nutrients. Under normal circumstances, food is digested into sugars, fats, and acids that are either immediately used or stored in organs such as the liver, muscles, and adipose tissue for future needs. Inherited metabolic disorders result from genetic abnormalities that interfere with enzyme activity. In contrast, acquired metabolic disorders develop due to modifiable lifestyle factors such as physical inactivity, excessive calorie intake, unhealthy dietary habits, and stress. These acquired conditions are largely preventable through early identification and lifestyle modification.Unhealthy lifestyle behaviors,including obesity, lack of physical activity, smoking, and poor dietary choices, significantly increase the risk of metabolic conditions such as type2 diabetes mellitus, insulin resistance, and metabolic syndrome. Therefore, it is important to assess a combination of lifestyle risk factors rather than focusing on a single factor.Previous studies have reported varying prevalence rates of metabolic syndrome across populations. Research from South Korea indicated higher prevalence among men with multiple lifestyle risk factors, while women with fewer risk factors showed increased abdominal obesity and lipid abnormalities. Studies from eastern India revealed that nearly one-third of adults were affected by metabolic syndrome, largely due to unhealthy dietary patterns and sedentary lifestyles.[1,2,3]

Scholars recognize metabolic syndrome as a rapidly growing public health issue closely linked to lifestyle and environmental factors. Studies emphasize the combined influence of sedentary behavior,unhealthy diet, stress, and genetic predisposition.Experts advocate for community-based screening, health education, and preventive strategies, emphasizing that lifestyle modification is effective than curative approaches on long-term impact of metabolic diseases. Aim of the study was to identify lifestyle-related risk factors contributing to metabolic diseases among adults in selected urban areas.[2,3]

NEED OF THE STUDY

When there are multiple diseases co existing in the form of high blood glucose, high pressure measurements of blood, increases B-M-I , all these invite syndromic diseases i.e. errors of metabolism leading to syndromic approach to treat the cause Metabolic syndrome. Parallelly its gives rise to cluster of diseases involving the cardiac, cerebral and vascular diseases, hence terming it as metabolic syndrome. There are ways to detect these growing problems and presence of few symptoms would determine ones proneness to these illnesses. A measurement of waist circumference > 40 inches & > 35 respectively in male and female gender could be diagnostic. Elevated tri-glycerides of over 150 mg/dl , decreased lipo-proteins < 40mg/dl, elevated fasting blood glucose levels above 100 mg/di, raised blood pressure systolic of 130mm of Hg should give one alarming ring indicating urgent attention to ones health Hence individual with these risk factors have compromised lifestyle increasing a manyfold risk of developing heart diseases, diabetes, obesity which accounts for 2/5th of the population continent wise. [4,5]

The statistics in the city of Pune shows that there are high incidences of diabetes accounting 21.9%, with age over 50 years it was 11.4%raised systolic blood pressure 40% in urban settings, 1/3rd of the population affected by obesity, B-M-I >25 kg/m2, prevalence in urban settings 39.6%, abdominal obesity was found to be 51.6%,especially with sedentary lifestyle and eating junk food.Cluster diseases of metabolic in nature where estimates were 26.6% in urban settings and 36.4% in adults. The above digits indicate the growing burden and results of varied studies, though these figures keep rolling, hence it becomes equally important to studies these factors which are interwoven between lifestyle factors and certain predisposing factors.Therefore the present study was undertaken to identify life-style risk factors of metabolic diseases among adults residing in selected areas.[5]

Methodology: This study used a quantitative research approach and exploratory survey design to study and understand lifestyle-related risk factors among adults. The sample consisted of 100 adults selected from different urban areas. The sample size was 100

participants. A non-probability purposive sampling technique was used, where participants were selected based on specific criteria. Tool consisted of demographic variables**,** Clinical Parameters, Risk-factor assessment, Diabetes Risk-Score, Hypertension Risk-Score **&** CVD Risk-Score. The overall Risk Status was also assessed. Validity score was within the acceptable range with final tool being formulated. The tool reliability was tested using the inter-rater method and Cohen's Kappa where the reliability coefficient was r = 1

RESULTS

When the demographic data was studied it was seen that he mean age (34.95 ± 11.34) years indicates a predominance of young adults. Out of 100 participants, 55% were female (n=55) and 45% were male (n=45), showing slight female predominance, which finds similarity with a study undertaken at Pune, Maharashtra, India 1/5th i.e 21.9% in the population age group of 50-59 years were suffering from diabetes, and estimate of eighty thousand cases remained undetected, which gave rise to 18% of newly detected cases, mostly women were identified. The reason being presence of females during survey, leaving an area of uncertainty of overestimation. 61% reported no family history of diabetes, 22% had a diabetic history from father, 10% from their mother, while, 4% from both father and Mother suggesting limited hereditary risk, 65% had no family history of hypertension, whereas 35% reported paternal hypertension, 17% had from Father and 9% from their mother, while 4% of participants from both.

Table No: 1 Diabetic Risk Score of the samples

n=100

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Diabetes Risk Score	100	0.0	22.0	7.12	4.26

Table No: 1 A : Diabetic Risk Category Analysis of the samples

n=100

Category	No. of Participants	Percentage
High	4	4.0%
Low	51	51.0%
Moderate	12	12.0%
Slightly elevated	33	33.0%
Total	**100**	**100%**

Present study findings in the above table stated that Scores ranged from 0 to 22, with 51% low, 33% slightly elevated, 12% Moderate while 4% high risk for diabetes — indicating mild to moderate risk in most.Scores ranged from 0 to 22, with 51% low, 33% slightly elevated, 12% Moderate while 4% high risk for diabetes — indicating mild to moderate risk in most.Mean risk scores suggest moderate risk for diabetes (7.0) within the group.

Table No: 2 Hypertension Risk Score of the samples

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Hypertension Risk Score	100	0.0	10.0	4.4	2.3

Table No:2 A: Hypertension Risk Category Analysis of the samples

n=100

Category	No. of Participants	Percentage
High	27	27%
Low	22	22%
Moderate	51	51%
Total	**100**	**100%**

Mean risk scores suggest moderate risk for hypertension (4.4) within the group, showing a predominance of moderate hypertension risk.

51% were in moderate risk, 27% high, and 22% low categories, showing a predominance of moderate hypertension risk.

Table No 3 CVD Risk Score of the samples

n=100

Variable	N	Minimum	Maximum	Mean	Std. Deviation
CVD Risk Score	100	0.0	15.0	4.350	2.5678

Table No: 3 A: CVD Risk Category Analysis of the samples

n=100

Category	No. of Participants	Percentage
High	3	3.0%
Low	77	77.0%

Moderate	19	19.0%
Very high	1	1.0%
Total	**100**	**100%**

Mean risk scores suggest moderate risk for CVD (4.35) within the group, indicating overall favourable cardiovascular risk profile.
77% had low CVD risk, 19% moderate, 3% high while 1% with vary high, indicating overall favourable cardiovascular risk profile.

Table No 4: Overall Risk Status Analysis of the samples

n=100

Category	**No. of Participants**	**Percentage**
High risk	11	11.0%
Low risk	64	64.0%
Moderate risk	25	25.0%
Total	**100**	**100%**

64% had **low risk**, **25% moderate**, and **11% high overall risk**, suggesting that while most participants were within manageable risk levels, preventive focus is needed.

Table 5: Kendall's tau-b and Spearman's rho test for the association between selected demographic variables and risk category scores.

Correlation (Kendall's tau-b and Spearman's rho)

n=100

SN	**Variable Pair**	**Kendall's Correlation**	**Sig. (P-Value)**	**Spearman's Correlation**	**Sig. (P-Value)**	**Interpretation**
1	**Age ↔ Diabetes Risk Score**	0.222	0.002	0.303	0.002	**weak–moderate positive correlation**
2	**Age ↔ Hypertension Risk Score**	0.441	<0.001	0.585	<0.001	**strong positive and highly significant correlation**
3	**Age ↔ CVD Risk Score**	0.611	<0.001	0.77	<0.001	**strongest correlation**
4	**BMI ↔ Diabetes Risk Score**	0.225	0.001	0.319	0.001	**moderate positive correlation**
5	**BMI ↔ Hypertension Risk Score**	0.317	<0.001	0.429	<0.001	**moderate correlation**
6	**BMI ↔ CVD Risk Score**	0.299	<0.001	0.412	<0.001	Moderate **correlation**
7	**BP High ↔ Hypertension Risk Score**	0.626	<0.001	0.79	<0.001	**strong aTable No : 4nd highly significant correlation**
8	**BP High ↔ CVD Risk Score**	0.407	<0.001	0.545	<0.001	moderate-strong association
9	**BP Low ↔ Hypertension Risk Score**	0.552	<0.001	0.714	<0.001	strong positive correlation
10	**BP Low ↔ CVD Risk Score**	0.391	<0.001	0.517	<0.001	strong positive correlation
11	**RBS ↔ Diabetes Risk Score**	0.137	0.053	0.2	0.046	weak positive correlation
12	**RBS ↔**	0.24	0.001	0.32	0.001	moderate

	CVD Risk Score					positive correlation

Age vs. Diabetes Risk Score: There is a **weak–moderate positive correlation** ($\rho = 0.303$, $p = 0.002$), indicating that diabetes risk increases significantly with age. This reflects the age-related progression of glucose intolerance.

Age vs. Hypertension Risk Score"A **strong positive and highly significant correlation** ($\rho = 0.585$, $p < 0.001$) shows that increasing age is closely associated with increased hypertension risk. This aligns with the biological rise of BP with vascular ageing.

Age vs. CVD Risk Score"This is the **strongest association in the dataset** ($\rho = 0.770$, $p < 0.001$). Older participants consistently show higher cardiovascular risk, confirming age as the central determinant of CVD.

BMI vs. Diabetes Risk Score"A **moderate positive correlation** ($\rho = 0.319$, $p = 0.001$) suggests that individuals with higher BMI have significantly higher diabetes risk. This finding is consistent with metabolic syndrome pathways.

BMI vs. Hypertension Risk Score"A similar **moderate association** ($\rho = 0.429$, $p < 0.001$) indicates that obesity contributes significantly to hypertension risk.

BMI vs. CVD Risk Score: Correlation is moderate ($\rho = 0.412$, $p < 0.001$), showing that increasing BMI elevates cardiovascular risk, driven by lipid and pressure burden.

BP High (Systolic) vs. Hypertension Risk Score:A **very strong and highly significant correlation** ($\rho = 0.790$, $p < 0.001$) confirms systolic BP as the major contributor to hypertension risk scoring.

BP High vs. CVD Risk Score:A moderate-strong association ($\rho = 0.545$, $p < 0.001$) indicates that higher systolic BP substantially increases cardiovascular risk.

BP Low (Diastolic) vs. Hypertension Risk Score: A strong positive correlation ($\rho = 0.714$, $p < 0.001$) signifies that diastolic BP also contributes substantially to hypertension severity.

BP Low vs. CVD Risk Score: A moderate relationship ($\rho = 0.517$, $p < 0.001$) suggests diastolic BP also predicts cardiovascular load.

RBS vs. Diabetes Risk Score: A weak positive correlation ($\rho = 0.200$, $p = 0.046$) indicates that higher blood sugar slightly increases diabetes risk scores, but the association is modest compared to age and BMI.

RBS vs. CVD Risk Score: A moderate positive correlation ($\rho = 0.320$, $p = 0.001$) suggests that higher RBS levels may contribute to elevated cardiovascular risk, reflecting the connection between impaired glucose regulation and vascular damage.

Age, BMI, and Blood Pressure are the strongest determinants of metabolic and cardiovascular risk scores.CVD Risk Score shows the strongest correlations, especially with age, BP, and hypertension risk, confirming biological expectations.RBS shows only modest associations, implying that glucose abnormalities alone contribute less to overall cardiovascular burden compared to age and BP.All significant associations follow physiologically expected patterns, indicating strong internal consistency and validity of the dataset.These findings clearly highlight the importance of managing weight, blood pressure, and glucose levels to reduce overall cardiovascular risk.

DISCUSSION

A study in South India by Krishnamoorthy Y et.al. 2020,reported 28.2 of prevalence of diabetes in 40-79 years, where dietary habits reason for the changes in statistics. Almost 1/5th unaware of their blood sugar levels, when tested it was found to be elevated.It calls for raising mass awareness,increase screening and surveys and educate people with the help of healthcare team members.[4]

These findings find relevance with a study done by Patil Reshma et.al (2022) undertaken at Pune urban slums to understand the prevalence of selected metabolic diseases revealed that all aspects of metabolic diseases should be studied independently as higher incidences of abdominal obesity in women , raised BP in both genders, both groups had also raised blood sugar levels , factors are contributory to the risk of metabolic diseases. As per this study the percentage of Asians suffering from these risk factors is around 37% and Indian has a varied scenario of 11-57%, with the city of Pune ranging between 26.6 %.[5,6]

Present study findings stated that Scores ranged from 0 to 22, with 51% low, 33% slightly elevated, 12% Moderate while 4% high risk for diabetes indicating mild to moderate risk in most.Scores ranged from 0 to 22, with 51% low, 33% slightly elevated, 12% Moderate while 4% high risk for diabetes — indicating mild to moderate risk in most.Mean risk scores suggest moderate risk for diabetes (7.0).A study by Kulkarni S, Kondalkar S, Mactaggart I et.al.2018 reported 28.2& of prevalence of diabetes within the age group of 40-79 years, where dietary habits was explained as a factor for the changes in statistics. Almost 1/5th unaware of their blood sugar levels, when tested it was found to be elevated.It calls for raising mass awareness , increase screening and surveys and educate people with the help of healthcare team members.[6,7]

CONCLUSION

The clinical profile of the study population indicates a high burden of modifiable cardiometabolic risks. Excess weight, elevated blood pressure, and unhealthy

behavioral patterns collectively contribute to increasing disease susceptibility.The high prevalence of prehypertension (39%) suggests that a majority of individuals are already experiencing elevated vascular load. Without intervention, progression to frank hypertension is highly likely.Sedentary lifestyle, daily stress, processed-food intake, and inconsistent dietary habits form a behavioral risk cluster that amplifies long-term cardiovascular and metabolic complications.Family history of hypertension, diabetes, or CVD further heightened risk, indicating genetic susceptibility layered with lifestyle influences.[8,9]

The study reveals that the population carries a significant burden of early and modifiable cardiometabolic risk factors. Obesity, elevated blood pressure, sedentary habits, and stress are the predominant contributors, with age, gender, BMI, and family history further influencing risk distribution. The statistical associations and clinically coherent patterns indicate that multiple risk domains converge to elevate overall cardiovascular and metabolic risk of population.[10]

The findings emphasize the need for preventive healthcare initiatives, including regular screening, weight management programs, physical activity promotion, and dietary modification. Early identification of highrisk individuals provides an opportunity to prevent ,delay the onset of major chronic conditions such as diabetes, hypertension, and cardiovascular disease.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest related to this study.

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