

Assess the Relationship Between Lifestyle Behaviours and Concomitant Risk Factors among Adults Attending the Medicine OPD at GIMS Teaching Hospital, Gadag

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Abstract: Background: Non-communicable diseases such as hypertension and diabetes mellitus are leading causes of death worldwide, strongly linked to modifiable lifestyle behavior's including smoking, physical inactivity, unhealthy diet, and alcohol consumption. In Gadag district, Karnataka, the National Family Health Survey-5 (NFHS-5, 2019–21) reports that 26.9% of men and 25% of women aged ≥ 15 years had elevated blood pressure or were on antihypertensive medication, while 15.6% of men and 14% of women had high or very high random blood glucose or were on medication to control blood sugar. The medicine OPD at GIMS Teaching Hospital, Gadag, records a daily footfall of 250–300 adults, a majority of whom present with hypertension and diabetes mellitus, with male patients outnumbering female patients. Given this substantial patient volume and disease burden, the present study examined the correlation between lifestyle behaviour and concomitant risk factors in this hospital OPD population to guide targeted nurse-led preventive interventions. Aim: This study aims to determine correlation between lifestyle behaviors and concomitant risk factors and rule out prevalence of complications of hypertension and diabetes mellitus patients. Methods: A descriptive correlational research design was adopted. Using non-probability purposive sampling, 300 adults aged 25–50 years with known or newly diagnosed hypertension and diabetes mellitus, attending the Medicine OPD, were enrolled. Lifestyle behavior's (smoking behaviour, physical inactivity, unhealthy diet, alcohol consumption) and concomitant risk factor severity (hypertension and diabetes mellitus) were assessed using a modified "The WHO STEPwise approach to noncommunicable disease risk factor surveillance (STEPSS)" tool. Data were analyzed using descriptive statistics (frequency, percentage, mean, SD) and Pearson's correlation coefficient at the 0.05 level of significance. Results: Of 300 participants, 48% (n=144) had hypertension only, 32% (n=96) had diabetes mellitus only, and 20% (n=60) had both conditions concomitantly. Among lifestyle domains, physical inactivity showed the highest proportion of participants in the High-risk category (23%, n=69), followed by alcohol consumption (17%), unhealthy dietary practice (17.7%) and smoking behaviour (16.7%); 27.3% (n=82) fell into the High-risk category for overall lifestyle behaviour score. Pearson's correlation across 16 domain-specific tests showed a statistically significant positive correlation only between smoking behaviour and diabetes mellitus score among participants with diabetes mellitus only ($r=0.251, p=0.014$); the remaining 15 correlations were not statistically significant ($p>0.05$). Conclusion: Concomitant risk factors were highly prevalent among adults attending the medicine OPD, with hypertension being the most common followed by diabetes mellitus and both occurring together in a notable proportion of participants physical inactivity was the most prevalent unhealthy lifestyle behavior of the 16 correlation tests conducted, only smoking behavior showed a significant positive correlation with Diabetes Mellitus score ($r=0.251, p=0.014$). All other lifestyle risk factors correlations were not significant in ($P>0.05$). This indicates that the link between lifestyle behavior and disease severity is specific to certain behaviors and conditions rather than uniform across all domains underscoring the need for targeted condition specific lifestyle counseling particularly smoking session in the population.

Keywords: Lifestyle behaviours, concomitant risk factors, hypertension, diabetes mellitus, Medicine OPD, correlational study, Health Belief Model

1. Introduction

Non-communicable diseases (NCDs) such as hypertension, diabetes mellitus, disease are the leading cause of death worldwide, accounting for an. In India, national surveillance data show that approximately 28.6% of adults currently use some form of tobacco², while fewer than 10% of Indian adults engage in any recreational physical activity, as reported by the ICMR–INDIAB study³.

These behavioral risk factors smoking, physical inactivity, unhealthy diet, and alcohol consumption rarely occur in

isolation. Nationally representative household data show substantial clustering of hypertension and diabetes mellitus within Indian communities⁴, and regional NCD risk-factor surveillance similarly documents a high co-occurrence of behavioral and clinical risk factors among Indian adults⁵. These two conditions are among the most common concomitant risk factors encountered in general medical outpatient settings. Understanding how modifiable lifestyle behaviours associate with the clinical severity of existing risk factors, rather than merely their presence, offers a more actionable basis for nurse-led screening and counselling in routine OPD care. This gap a domain-specific, severity-linked

assessment within a single hospital-based cohort motivated the present study.

2. Conceptual Framework

The study was guided by Rosenstock's Health Belief Model (HBM)⁶, which explains health-related behaviour through six constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. Evidence from systematic review confirms that perceived susceptibility and self-efficacy are the HBM constructs most strongly associated with health-promoting behaviour and self-management in hypertension⁷. In this study, adults' perceived susceptibility and severity regarding hypertension and diabetes mellitus were reflected in their reported lifestyle behaviours (smoking, physical inactivity, dietary practice, alcohol use); perceived benefits and barriers shaped the extent of risk-reducing behaviour adopted; and clinical scoring of hypertension and diabetes mellitus severity represented the health outcome through which the model's predictive utility was examined. The model provided a behavioral lens for interpreting why lifestyle-behaviour domains related differently or not at all to concomitant risk-factor severity across the three clinical groups studied.

Objectives of the Study

- To assess the lifestyle behaviours
- To identify the prevalence of concomitant risk factors
- To determine the correlation between lifestyle behaviours and concomitant risk factors.

3. Materials and Methods

A quantitative research approach with a descriptive correlational design was adopted. The study was conducted in the Medicine OPD of GIMS Teaching Hospital, Gadag, Karnataka. Using non-probability purposive sampling, 300 adults aged 25–50 years of both genders, with known or newly diagnosed hypertension and/or diabetes mellitus attending the Medicine OPD, were enrolled. Pregnant women with diabetes and individuals who refused consent were excluded.

“The WHO STEP wise approach to noncommunicable disease risk factor surveillance (STEPSS)” was developed and validated by subject experts to assess (a) sociodemographic variables, (b) lifestyle behaviours across four domains smoking behaviour, physical inactivity, unhealthy dietary practice, and alcohol consumption and (c) clinical scoring of hypertension and diabetes mellitus severity. Data were collected after obtaining formal institutional and ethics committee approval and written informed consent from participants, who were assured of anonymity, confidentiality, and voluntary participation.

Descriptive statistics (frequency, percentage, mean, standard deviation) were used to summarize sociodemographic variables, lifestyle-behaviour scores, and risk-factor prevalence. Pearson's correlation coefficient (r) was used to test the association between each lifestyle-behaviour domain and each risk-factor severity score, separately within the three concomitant risk-factor groups (diabetes mellitus only, hypertension only, both), at the 0.05 level of significance.

4. Results

Sociodemographic Characteristics

Study participants of 300 in that, the largest age group was 46–50 years (47.3%, n=142); 54% (n=162) were male; 83% (n=249) were Hindu; 51.7% (n=155) belonged to joint families; 46.7% (n=140) reported a monthly family income of ≤₹20,000; 25.7% (n=77) had informal education; 47.7% (n=143) resided in rural areas; 37.7% (n=113) reported a positive family history of cardiovascular disease; 80.3% (n=241) were married; and 76.7% (n=230) followed a mixed dietary pattern.

Table 1: Descriptive statistics of lifestyle-behaviour domain scores (N=300)

Lifestyle Domain	Mean	SD
Smoking behaviour	3.40	2.96
Physical inactivity	4.68	1.09
Unhealthy dietary practice	5.77	0.94
Alcohol consumption	3.54	3.64
Overall lifestyle behaviour score	17.39	6.48

Table 2: Distribution of participants by level of risk across lifestyle-behaviour domains (N=300)

Risk Level	Smoking n (%)	Physical Inactivity n(%)	Unhealthy Diet n(%)	Alcohol n(%)	Overall n(%)
Low risk	114 (38.0)	129 (43.0)	101 (33.7)	151 (50.3)	109 (36.3)
Moderate risk	136 (45.3)	102 (34.0)	146 (48.7)	98 (32.7)	109 (36.3)
High risk	50 (16.7)	69 (23.0)	53 (17.7)	51 (17.0)	82 (27.3)

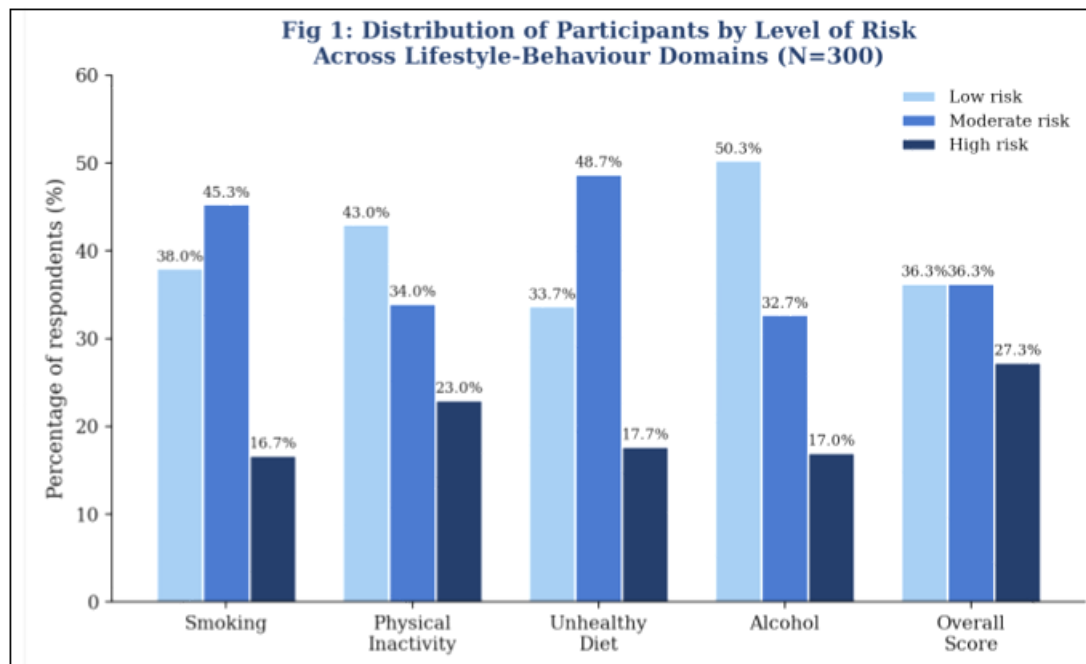


Figure 1: Shows that physical inactivity had the highest proportion of participants in the High-risk category (23%) among the four individual lifestyle domains, while alcohol consumption had the highest proportion in the Low-risk category (50.3%). Overall lifestyle-behaviour score placed 27.3% of participants in the High-risk category.

Prevalence of Concomitant Risk Factors

Table 3: Distribution of participants by concomitant risk-factor group (N=300)

Concomitant Risk Factor Group	Frequency (n)	Percentage (%)
Diabetes Mellitus only	96	32.0
Hypertension only	144	48.0
Both DM & HTN	60	20.0

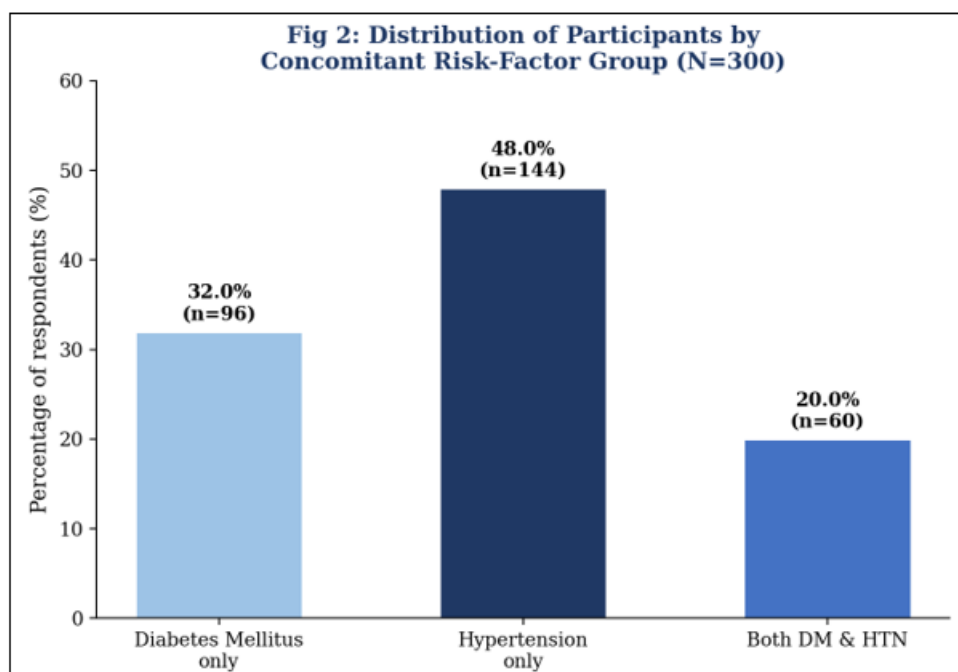


Fig 2 and Table 3 show that hypertension only was the most prevalent concomitant risk-factor presentation (48.0%, n=144), followed by diabetes mellitus only (32.0%, n=96) and both conditions concurrently (20.0%, n=60).

Correlation Between Lifestyle Behaviours and Concomitant Risk Factors

Table 4: Pearson's correlation between lifestyle-behaviour domains and risk-factor severity scores, by concomitant risk-factor group

Correlation Tested	Group	n	r (p value)	Decision
Smoking behaviour with DM score	DM only	96	0.251 (0.014) *	Ho rejected
Physical inactivity with DM score	DM only	96	0.066 (0.520)	Ho accepted
Unhealthy diet with DM score	DM only	96	0.078 (0.450)	Ho accepted
Alcohol consumption with DM score	DM only	96	0.139 (0.177)	Ho accepted
Smoking behaviour with HTN score	HTN only	144	0.032 (0.704)	Ho accepted
Physical inactivity with HTN score	HTN only	144	0.063 (0.450)	Ho accepted
Unhealthy diet with HTN score	HTN only	144	0.009 (0.914)	Ho accepted
Alcohol consumption with HTN score	HTN only	144	0.049 (0.563)	Ho accepted
Smoking behaviour with DM score	Both DM & HTN	60	0.003 (0.980)	Ho accepted
Physical inactivity with DM score	Both DM & HTN	60	0.021 (0.876)	Ho accepted
Unhealthy diet with DM score	Both DM & HTN	60	-0.025 (0.852)	Ho accepted
Alcohol consumption with DM score	Both DM & HTN	60	0.045 (0.731)	Ho accepted
Smoking behaviour with HTN score	Both DM & HTN	60	-0.103 (0.435)	Ho accepted
Physical inactivity with HTN score	Both DM & HTN	60	0.010 (0.938)	Ho accepted
Unhealthy diet with HTN score	Both DM & HTN	60	0.039 (0.765)	Ho accepted
Alcohol consumption with HTN score	Both DM & HTN	60	-0.015 (0.909)	Ho accepted

*Statistically significant at $p < 0.05$.

Table 4 shows that of the 16 correlations tested, only one smoking behavior with diabetes mellitus score among participants with diabetes mellitus only ($r=0.251$, $p=0.014$) was statistically significant, indicating a weak-to-moderate positive relationship. The remaining 15 domain-group combinations did not reach statistical significance, so the null hypothesis was rejected only for this single association and retained for all others.

5. Discussion

The predominance of hypertension-only presentation (48%) over diabetes-only (32%) and combined presentation (20%) is consistent with nationally documented patterns of hypertension and diabetes clustering in Indian communities, where hypertension is frequently the more prevalent single condition⁴.

Physical inactivity emerged as the lifestyle domain with the highest proportion of participants at High risk (23%), aligning with ICMR-INDIAB findings that fewer than 10% of Indian adults meet recommended activity levels reinforcing physical inactivity as a pervasive, largely unaddressed behavioral risk factor in this population³.

The single statistically significant correlation smoking behaviour with diabetes mellitus severity among the diabetes-only group ($r=0.251$, $p=0.014$) suggests that smoking's association with glycaemic-related severity may be more detectable in the absence of concurrent hypertension, possibly because hypertension management or its own behavioral correlates attenuate or confound this relationship in the combined group. The absence of significant correlation for physical inactivity, diet, and alcohol with either risk-factor score across all three groups indicates that, in this sample, self-reported behavioural risk did not track linearly with clinical severity scoring. Within a Health Belief Model lens, this pattern is consistent with review evidence that perceived susceptibility and self-efficacy most strongly predict whether a risk behaviour is present at all^{6,7}, rather than predicting fine-grained gradations in an already-diagnosed condition's clinical severity.

6. Conclusion

This study found a high burden of concomitant risk factors among adults attending the Medicine OPD, with hypertension being the most prevalent single condition and one in five participants presenting with both hypertension and diabetes mellitus. While physical inactivity was the most widespread high-risk lifestyle behaviour, a statistically significant correlation between lifestyle behaviour and clinical risk-factor severity was demonstrated only for smoking behaviour among adults with diabetes mellitus. This indicates that the lifestyle-severity relationship in this population is behaviour- and condition-specific, rather than uniform, and supports targeted rather than generic lifestyle counselling in OPD nursing practice.

7. Implications

- 1) Structured lifestyle-behaviour screening may be incorporated into routine OPD nursing assessment to identify adults at high risk of concomitant NCDs.
- 2) Smoking-cessation counselling should be prioritized for adults diagnosed with diabetes mellitus, given the significant correlation identified.
- 3) Physical-activity promotion programmes are warranted given the high proportion of participants at High risk for inactivity, even where correlation with clinical severity was not significant.
- 4) Findings support nurse-led, condition-specific rather than generic lifestyle counselling protocols in Medicine OPD settings.

8. Limitations

- 1) Single-center design limited to the Medicine OPD of one teaching hospital, limiting generalizability.
- 2) Non-probability purposive sampling may introduce selection bias.
- 3) Cross-sectional correlational design precludes causal inference.
- 4) Lifestyle behaviours and risk-factor severity were assessed via structured self-report and record-based

scoring rather than objective biochemical or ambulatory clinical measures.

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