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Research Article

Risk of Type 2 Diabetes Mellitus among Adult Population during COVID-19 Pandemic in Lucknow district of Uttar Pradesh, India

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A B S T R A C T

Background: The COVID-19 pandemic represents a global health emergency with deep behavioural, social, and medical implications. According to World Health Organization statistics 628.6 million people are expected to develop diabetes by the year 2045. Diabetes and its complication can be prevented by detecting high-risk patients by screening and early interventions.

Objective: To evaluate the risk of developing type 2 diabetes mellitus among adults during the COVID-19 pandemic by applying the Indian Diabetes Risk Score

Methodology: A pre-tested and pre-designed questionnaire with the application of the IDRS was used to gather information from 262 adults from the urban and rural areas of the Lucknow district.

Results: Among 262 participants, 47.33% were from rural areas, and 41.60% were aged >50 years. Males constituted 52.67%, and 66.03% of the population was married. Most participants belonged to socioeconomic classes III and IV. According to IDRS, 46.56% were at high risk and 41.98% at moderate risk for diabetes. During the COVID-19 period, 27.10% reported weight gain, only 16.79% followed a regular daily meal pattern, and 46.95% did not engage in any structured physical activity. A moderate to high diabetes risk was significantly associated with residence, marital status, occupation, education, socioeconomic class, weight change, dietary pattern, physical activity, and increased screen time (P≤0.006).

Conclusion: The Indian Diabetes Risk Score may be employed to identify high-risk or diabetic individuals in the Indian population who are undiagnosed. Prevention of diabetes would require mass community-level information, education, and communication interventions.

Keywords: COVID-19, IDRS, Type 2 Diabetes Mellitus

Introduction

Hyperglycaemia brought on by a malfunction in insulin production, insulin sensitivity, or both is a hallmark of diabetes mellitus, a group of metabolic diseases. Blood glucose levels that are higher than usual but below the cut-off points needed to diagnose diabetes are indicative of a prediabetic condition. Surprisingly, prediabetes has no symptoms. The prevalence of diabetes in adults has increased nearly fourfold since 1980, from 4.7% to 8.5%.[1] As per World Health Organization (WHO) predictions, the incidence of Diabetes among adults is 8.8% and is estimated to reach 11.4% by 2045.[2] The increase in the population of Diabetes mellitus patients is directly proportional to the increased complications, which also lower the quality of life and increase the burden and expense of care.[3] The COVID epidemic has caused challenges that have changed people's lives all around the world. Long periods of social isolation can cause boredom and tension, which can further push people to overeat, especially in "comfort foods" that are rich in calories. Second, prolonged indoor confinement may result in lower physical activity outside and increased screen time, which can exacerbate sedentary behavior. Furthermore, sleep patterns and quality may be affected by confinement at home and the need to adjust to routine interruptions.[4] To reverse the changes and maintain optimal health status at both the individual and community levels, it is essential to comprehend the extent of changes in lifestyle-related behaviors and the COVID-19-specific etiology of such behaviors.[5] As a huge majority of India's population remains undiagnosed with diabetes, we use the IDRS as a preventive and screening method for the development of the disease in high-risk patients.[6] Therefore, methods like the IDRS play a significant role in developing efficient screening methods to reveal the hidden effects of the disease while enabling us to make our resources as cost-efficient as possible. The purpose of this research is to utilize the IDRS during the COVID-19 pandemic to assess the prevalence and risk factors associated with the development of diabetes in the adult population of Lucknow. It is also aimed at determining the relationship between individuals at high risk of acquiring diabetes and several risk variables, including age, waist circumference, family history of diabetes, physical activity, and sociodemographic characteristics.

Materials and Methods

- **Study Area :** Rural and Urban Areas of Lucknow District
- **Duration of study:** One year, 2021 July to 2022 July.
- **Research Methodology:** A cross-sectional analysis.
- **Study Population:** Adults aged over 30 years with no prior history of diabetes.
- **Study instruments:** A pre-formatted and pre-tested questionnaire was utilised to gather data in an organized and standardized form. Risk assessment for T2DM was conducted using the IDRS.

A multivariate logistic regression model comprising four basic variables—age, abdominal obesity, family history of diabetes, and leisure-time physical activity—was previously used to create a diabetes risk score. A risk score with a range of 0-35 was generated by the regression analysis. Researchers felt compelled to add some categories to the risk score because the analysis only included a few categories under each risk factor, and it did not account for the risk factor's severity (for example, an abdominal obese male with a waist circumference >90 and >100 cm was treated similarly). Additionally, they decided to simplify the Diabetes Risk Score by rounding it down to the nearest five and then doubling it to produce a maximum score of 100, enabling the broad use of these risk ratings.[7]

Inclusion Criteria were:

- Adults aged 30 years and above.
- Residents of the Lucknow district.

Exclusion Criteria were:

- Adults with a history of diabetes and other complications.

Sample Size

The sample size is calculated on the basis of the specificity of IDRS for diagnosis of DM using the formula (reference: V Mohan et al):

$$n = \frac{z_{\alpha}^2 S_p \left(100 - S_p\right)}{\left(1 - p\right) e^2}$$

Where S_p = 60.1%, specificity of IDRS for diagnosis of DM.

p = 0.613 (61.3%), Diagnostic accuracy of IDRS.

e = 0.1, error factor.

Type I error (level of significance) α=0.05.

The power of the study was 90% and

Data loss factors were 10%.

Then the minimum sample size required was 262.

Data Collection and Analysis

Data was gathered using a standardized questionnaire that had been previously created and evaluated. The IDRS was used to assess the risk of type 2 diabetes. SPSS-20.0 version software was employed for analyzing and visualizing the data. The data were characterized using descriptive statistical analysis, which included the chi-square test, frequency, and percentage. Independent factors included age, employment, education, social class, religion, and marital status. P values less than 0.001 were considered significant.

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Working definition

- **This research includes the following modified risk variables:**
- **Age:** Those under 35 were placed in group 0, those between 35 and 49 in group 1, and those above 50 in group 2.
- **Abdominal obesity:** Men who have a waist circumference of 90 to 99 cm are designated as 1, those who have a circumference of 100 cm as 2, and everybody else is designated as 0. For women, the waist circumference is 1 if it is 80–89 cm, 2 if it is 90 cm, and 0 otherwise.
- **Diabetes in the family:** Individuals with one parent having the condition were assigned a score of 1, those with both parents having the condition were assigned a score of 2, and those without a family history of the condition were assigned a score of 0.
- **Physical activity:** People who exercised during their free time and had physically demanding jobs were rated as 0; people who did either exercise or physically demanding employment were graded as 1, and the remaining people were marked as 2.Four easy questions and one anthropometric measurement, waist circumference, can be used to get data on these risk variables.

The four questions are:

- How old are you?
- Does diabetes run in your family? If so, is your mother, father, or both of them diabetic?
- Are you a regular exerciser?
- How physically taxing is your line of work? [7]

Results

A total of 262 apparently healthy individuals aged 30 years and above participated in the study.

Table 1 presents the sociodemographic data about the individuals. Of them, 47.33 percent are from rural regions, and the remainder (52.67%) are from metropolitan areas. Those over 50 made up the largest percentage of participants (41.60%), followed by those under 35 (30.92%) and those between the ages of 35 and 49 (27.48%). Of them, 47.33% were female, and 52.67% were male. 58.78% of individuals identify as Muslims, which is the majority. They were married (66.03%). Higher education was held by 42.37 percent of the population. Of the population, 25.19% are housewives, 24.05% are company owners, and 18.70% are labourers. The largest percentage of subjects is in social class IV (44.66%), followed by class III (43.51%).

Table 2 displays the distribution of subjects by IDRS component. (41.60%) of people were older than 50. 43.13% of people had waists between 80 and 89 cm in women and 90 to 99 cm in men. Of them, 44.27 percent regularly engaged in regular mild exercise or other forms of physical activity at home or at work, and 53.44 percent had no parents who had the disease.

Figure 1 displays the distribution of study participants by IDRS Category. Only (46.56%) participants were in the high risk IDRS category, whereas (41.98%) subjects fell into the moderate risk category.

Above table illustrates the distribution of study participants according to IDRS categories. Nearly half of the participants (46.56%) were classified as high risk, while 41.98% fell into the moderate-risk category.

Table 4 reveals the impact of COVID-19 on lifestyle-related behaviors, with only 27.10% reporting some weight gain, while 49.62% maintained a stable weight. Only 16.79% of people kept a regular eating schedule every day. (33.59%) maintained a regular eating schedule once or twice per week, while (38.17%) had no such schedule. Only (38.93%) exercise once or twice a week, while (46.95%) do not maintain any sort of fitness regimen. 40% of people reported spending 2-4 hours each day sitting down. 1 to 2 hours of screen time were found in 48.09% of cases, and under 1 hour in 21.37%. (64.5%) were reported to sleep for 6 to 8 hours, and 15.65% slept for more than 8 hours. As the majority of the population belongs to the Islamic religion, there were very few addictions reported. Only 34.73% of the population sometimes got support from their family in maintaining a healthy lifestyle during the pandemic period.

Table 5 displays the associations between variables and IDRS. In both urban and rural settings, there was a statistically significant association with the risk of moderate to high diabetes ($P<0.001$). Additionally, there is a strong correlation of marital status and occupation with risk of diabetes ($P<0.001$). Education and socioeconomic class also exhibit a strong correlation with increased risk ($P=0.001$). Gaining weight and eating regularly were similarly linked to high and moderate risk ($P<0.001$). People who exercise at a moderate intensity ($P=0.005$) and those whose screen time

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Table 1. Distribution of socio-demographic characteristics

(n=262)

Sociodemographic Variables		n	%
Setting	Urban	138	52.67
	Rural	124	47.33
Age	<35	81	30.92
	35-49	72	27.48
	>/=50	109	41.60
Gender	Male	138	52.67
	Female	124	47.33
Religion	Hinduism	108	41.22
	Islam	154	58.78
	Others	0	0.00
Marital status	Married	173	66.03
	Unmarried	39	14.89
	Widow	50	19.08
	Divorcee	0	0.00
Education	Illiterate	52	19.85
	Primary	47	17.94
	Secondary	52	19.85
	higher secondary and above	111	42.37
Occupation	Business	63	24.05
	household worker	21	8.02
	Housewife	66	25.19
	Labourer	49	18.70
	Service	36	13.74
	Retired	10	3.82
	Others	17	6.49
	Unemployed	6	0.06
SES	I	0	0.00
	II	19	7.25
	III	114	43.51
	IV	117	44.66
	V	12	4.58

Table 2. Risk Score components of IDRS

Risk Score components of IDRS		n	%
Age	<35	81	30.92
	35-49	72	27.48
	>/=50	109	41.60

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Abdominal Obesity	i. Waist measurements of less than 80 cm for females and less than 90 cm for males.	93	35.50
	ii. Waist measurements between 80 and 89 cm for females and between 90 and 99 cm for males.	113	43.13
	iii. Waist measurements of 90 cm or greater for females and 100 cm or greater for males.	56	21.37
Physical Activity	i. in regular vigorous exercise or doing strenuous (manual) tasks at home or work.	13	4.96
	ii. Participating in regular moderate exercise or engaging in moderate physical activities at home or work.	47	17.94
	iii. Involvement in regular mild exercise or light physical activity at home or work.	116	44.27
	iv. No physical activity and/or engaging in sedentary behavior at home or work.	86	32.82
Family History of Diabetes	i. Neither parent has diabetes.	140	53.44
	ii. One of the parents has diabetes.	93	35.50
	iii. Both parents are diabetic.	29	11.07

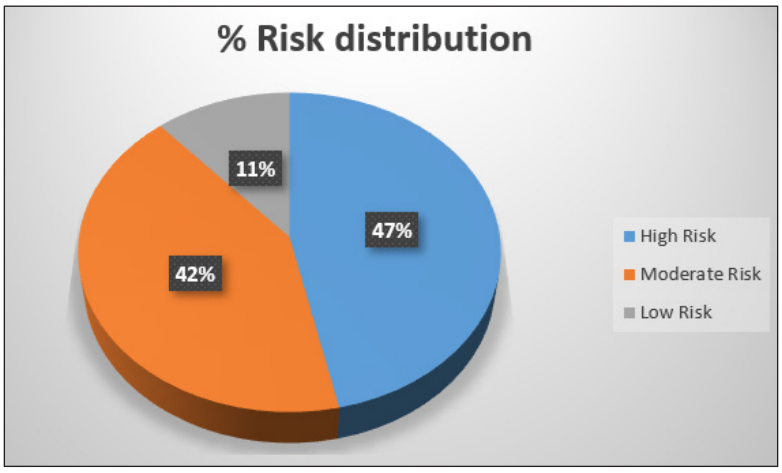

Figure 1. Distribution of study subjects according to group of IDRS

Table 3.Assessment of risk for diabetes among study participants by IDRS

Risk of Diabetes	Frequency	Percentage
High	122	47 (46.56)
Medium	110	42 (41.98)

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Low	30	11 (11.46)
Total	262	100

Table 4.Impact of COVID-19 Pandemic on lifestyle-related behaviour

(n=262)

Impact of the COVID-19 Pandemic on lifestyle-related behaviour		n	%
Weight	Stable weight	130	49.62
	Weight loss	47	17.94
	Weight gain	71	27.10
	don't know	14	5.34
Regular Meal Pattern Meal pattern	Not routinely	100	38.17
	One to two times a week	88	33.59
	Three to four times a week	23	8.78
	Five to six times a week	7	2.67
	Almost daily	44	16.79
Moderate intensity exercise Level of exercise intensity	Not frequently	123	46.95
	a couple of times every week	102	38.93
	Between three and four times each week	15	5.73
	Every five to six days	11	4.20
	Nearly every day	11	4.20
Daily sitting time	Not more than two hours	95	36.26
	Two to four hours	105	40.08
	Four to six hours	19	7.25
	Six to eight hours	20	7.63
	More than 8 hours	23	8.78
Screen time	Zero to one hours	56	21.37
	One to two hours	126	48.09
	Two to four hours	43	16.41
	More than five hours	37	14.12
Sleep hours	Less than 6 hours	52	19.85
	Six to eight hours	169	64.50
	More than eight hours	41	15.65
Smoking habit	No	196	74.81
	One to three cigarettes each day	39	14.89
	Four to six cigarettes each day	27	10.31
Alcohol	No	206	78.63
	on special occasions	25	9.54
	on weekends	31	11.83
	> once a week	0	0.00
	almost daily	0	0.00

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Support from family	Always (> 90%)	29	11.07
	Most of the time	67	25.57
	Sometimes	91	34.73
	Occasionally	34	12.98
	Rarely	41	15.65

Table 5.Association of characteristics among subjects with IDRS

(n=262)

Variable	Sub-category	High Riskn (%)	Moderate Riskn (%)	Low Riskn (%)	Chi-square	p-value
Setting	Urban	70 (50.7%)	66 (47.8%)	2 (1.4%)	28.92	<0.001
	Rural	52 (41.9%)	44 (35.5%)	28 (22.6%)		
Gender	Male	61 (44.2%)	61 (44.2%)	16 (11.6%)	0.7	0.706
	Female	61 (49.2%)	49 (39.5%)	14 (11.3%)		
Religion	Hinduism	43 (39.8%)	43 (39.8%)	22 (20.4%)	14.77	0.001
	Islam	79 (51.3%)	67 (43.5%)	8 (5.2%)		
	Others	0 (0.0%)	0 (0.0%)	0 (0.0%)		
Marital Status	Married	77 (44.5%)	76 (43.9%)	20 (11.6%)	39.09	<0.001
	Unmarried	6 (15.4%)	23 (59.0%)	10 (25.6%)		
	Widow	39 (78.0%)	11 (22.0%)	0 (0.0%)		
	Divorcee	0 (0.0%)	0 (0.0%)	0 (0.0%)		
Education	Illiterate	31 (59.6%)	19 (36.5%)	2 (3.8%)	22.4	0.001
	Primary	30 (63.8%)	15 (31.9%)	2 (4.3%)		
	Secondary	24 (46.2%)	18 (34.6%)	10 (19.2%)		
	Higher secondary & above	37 (33.3%)	58 (52.3%)	16 (14.4%)		
Occupation	Business	24 (38.1%)	25 (39.7%)	14 (22.2%)	39.11	<0.001
	Household worker	7 (33.3%)	12 (57.1%)	2 (9.5%)		
	Housewife	41 (62.1%)	21 (31.8%)	4 (6.1%)		
	Labourer	19 (38.8%)	28 (57.1%)	2 (4.1%)		
	Service	15 (41.7%)	19 (52.8%)	2 (5.6%)		
	Retired	0 (0.0%)	0 (0.0%)	0 (0.0%)		
	Others	3 (30.0%)	3 (30.0%)	4 (40.0%)		
	Unemployed	13 (76.5%)	2 (11.8%)	2 (11.8%)		
Socioeconomic	I	0 (0.0%)	0 (0.0%)	0 (0.0%)	41.86	<0.001
	II	6 (31.6%)	13 (68.4%)	0 (0.0%)		
	III	37 (32.5%)	51 (44.7%)	26 (22.8%)		
	IV	69 (59.0%)	44 (37.6%)	4 (3.4%)		
	V	10 (83.3%)	2 (16.7%)	0 (0.0%)		

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Weight	Stable weight	67 (51.5%)	47 (36.2%)	16 (12.3%)	27.95	<0.001
	Weight loss	20 (42.6%)	25 (53.2%)	2 (4.3%)		
	Weight gain	35 (49.3%)	24 (33.8%)	12 (16.9%)		
	Don't know	0 (0.0%)	14 (100.0%)	0 (0.0%)		
Regular Meal Pattern	Not routinely	58 (58.0%)	32 (32.0%)	10 (10.0%)	46.98	<0.001
	One to two times a week	19 (21.6%)	51 (58.0%)	18 (20.5%)		
	Three to four times a week	9 (39.1%)	12 (52.2%)	2 (8.7%)		
	Five to six times a week	7 (100.0%)	0 (0.0%)	0 (0.0%)		
	Almost daily	29 (65.9%)	15 (34.1%)	0 (0.0%)		
Moderate Intensity Exercise	Not routinely	65 (52.8%)	44 (35.8%)	14 (11.4%)	21.82	0.005
	One to two times a week	43 (42.2%)	47 (46.1%)	12 (11.8%)		
	Three to four times a week	0 (0.0%)	13 (86.7%)	2 (13.3%)		
	Five to six times a week	7 (63.6%)	2 (18.2%)	2 (18.2%)		
	Almost daily	7 (63.6%)	4 (36.4%)	0 (0.0%)		
Daily Sitting Time	Less than 2 hours	48 (50.5%)	39 (41.1%)	8 (8.4%)	6.59	0.582
	2-4 hours	45 (42.9%)	46 (43.8%)	14 (13.3%)		
	4-6 hours	6 (31.6%)	11 (57.9%)	2 (10.5%)		
	6-8 hours	10 (50.0%)	8 (40.0%)	2 (10.0%)		
	More than 8 hours	13 (56.5%)	6 (26.1%)	4 (17.4%)		
Screen Time	0-1 hours	27 (48.2%)	27 (48.2%)	2 (3.6%)	17.93	0.006
	1-2 hours	55 (43.7%)	49 (38.9%)	22 (17.5%)		
	2-4 hours	28 (65.1%)	13 (30.2%)	2 (4.7%)		
	>5 hours	12 (32.4%)	21 (56.8%)	4 (10.8%)		
Sleep Hours	<6 hours	17 (32.7%)	21 (40.4%)	14 (26.9%)	16.83	0.002
	6-8 hours	85 (50.3%)	70 (41.4%)	14 (8.3%)		
	> 8 hours	20 (48.8%)	19 (46.3%)	2 (4.9%)		
Smoking Habit	No	90 (45.9%)	82 (41.8%)	24 (12.2%)	11.27	0.024
	1-3 cigarettes/ day	14 (35.9%)	23 (59.0%)	2 (5.1%)		
	4-6 cigarettes/ day	18 (66.7%)	5 (18.5%)	4 (14.8%)		

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Alcohol	No	95 (46.1%)	87 (42.2%)	24 (11.7%)	13.87	0.008
	On special occasions	6 (24.0%)	17 (68.0%)	2 (8.0%)		
	On weekends	21 (67.7%)	6 (19.4%)	4 (12.9%)		
	> once a week	0 (0.0%)	0 (0.0%)	0 (0.0%)		
	Almost daily	0 (0.0%)	0 (0.0%)	0 (0.0%)		
Support from Family	Always (> 90%)	14 (48.3%)	11 (37.9%)	4 (13.8%)	50.12	<0.001
	Most of the time	17 (25.4%)	30 (44.8%)	20 (29.9%)		
	Sometimes	39 (42.9%)	46 (50.5%)	6 (6.6%)		
	Occasionally	25 (73.5%)	9 (26.5%)	0 (0.0%)		
	Rarely	27 (65.9%)	14 (34.1%)	0 (0.0%)		

has increased (P=0.006) showed a significant connection with the risk of getting diabetes in the future. The IDRS and the characteristic variables such as stable weight, weightless, and weight gain were found to be significantly associated (P<0.001).

Discussion

In the present study, which involved 262 normal participants from the Lucknow area, it was observed that 52.67% of the participants belonged to urban areas, while47.33% belonged to rural areas. 47.33% of the population were female and 52.67% were male. The same findings, with a mean age of 41.4 years, were reported by Podder V [3] et al. In this sample population, 50.6% of the participants were female and 49.4% were male; 45.8% were rural participants and 54% were urban participants. In the present study, participants aged less than 35 years were the largest age group (30.92%), followed by participants aged between 35 and 49 years (27.48%), with 41.60% of the participants aged more than 50 years. Muslim individuals comprised 58.78% of the population. married individuals comprised 66.03%. 42.37 percent of the population had higher education.

As per Sengupta B. et al.[1] research, most of the participants (51.40%) were over the age of 50, followed by participants in the 35 to 49 years and the less than 35 years age groups. 57.80% of the population were female, 85.50% belonged to the Hindu religion, and 11.10% were Muslim. 86.5% of the participants were married.

In our study, we found 41.60 percent of the population was above 50 years. Waist circumference among women was 80 to 89 cm, and among men, 90 to 99 cm. 44.27 % of them were engaged in light physical work or other physical activities regularly in industries or homes, and 53.44 % of them had no parents with the disease. Singh M. M. et al.[8] have found, in their research, that 53 (18.3%), 130 (44.8%), and 133 (45.9%) of the students, respectively, possessed a family history of diabetes, low physical activity, and high waist circumference as IDRS risk factors.

Sengupta B et al. [1] reported that 34.20% of research participants had a high risk of acquiring diabetes in the near future, 63.70% had a moderate risk, and 2.10% had a low risk based on IDRS. Just 110 (41.98%) of the research participants were in the moderate risk group, just 11% were in the low risk group, and only 122 (46.56%) were in the high risk IDRS. In their study, Khan Mustufa M et al. [9] found that 72.6% of participants had no family history of diabetes, whereas 27.4% of individuals had one or both parents with the disease. Just 3.2% of patients had minimal risk (IDRS score< 30), whereas two-thirds (67.2%) had high risk for diabetes (IDRS score>60), followed by 29.6% with intermediate risk (IDRS score 30–50). We also measured to look at the impact of the COVID 19 pandemic on the lifestyle-related behaviour of the participants. Only 27.10% of the participants in our study reported some weight gain, while 49.62% reported stable weight. Ghosalet al.[10] noted in their study that 40% of individuals had gained weight. 41% of the population's weight remained stable, while 19% of individuals lost weight to some degree. We noted that most of the participants had no fixed eating habits, while only 16.79% of individuals had them. According to Kumari A et al. [4], nearly three-fourths of the participants reported increasing or maintaining their consumption of major meals, between-meal snacks, and portions of meals and snacks. The overall consumption of fast food and junk food was found to be the same or less , However, the consumption of junk food during the lockdown was found to have increased slightly due to stress or boredom. For the assessment of lifestyle-related behaviour during COVID-19, Chopra S. et al. [5] developed a series of questionnaires. They noted that only 37. Ten percent of the participants were regularly engaging in moderate-intensity aerobic activity for more than five days a week. Most individuals

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reported some mild distress but maintained a regular sleep pattern with fair quality. Only 38.93% of the participants in our study exercised once or twice a week, and most of them did not have any sort of fitness routine. Only a few of them reported sleeping more than 8 hours. The average reported sleeping 6 to 8 hours. The most common frequency of exercise reported was once or twice a week.

In our study, it was found that there was a statistically significant correlation between the risk of moderate to severe diabetes in rural and urban areas (P 0.001) , as the people were confined to their homes due to COVID-19 and due to lockdown, they developed an unhealthy lifestyle. The majority of the people in the age group of 50 years were at higher risk as compared to those in the age group of 35 to 49 years (P 0.001), according to Nittoori S et al. [11]. According to Misra A et al. [12] in a study done in North India, no statistically significant correlation was found between gender and risk score. In our study, we also found no such correlation.

Additionally, occupation was also strongly associated with risk of diabetes (P<0.001) as businessmen or housewives and unemployed people are doing light or no exercis, along with no proper diet plan, which could be the reason for the increased risk. Patil S R et al. [13] also reported that education (P = 0.004) and socioeconomic class 4 and 5 (P = 0.002) were significantly associated with the risk status of diabetes. The same results of association between education and socioeconomic class with increased risk (P=0.001) were seen in our study because these people are not aware that they can get diabetes or not, and also low socioeconomic status acts as a barrier in adopting a healthy way of life. Patil S R et al.[13] also reported a highly significant association between physical activity and increased risk of diabetes in the near future. Same results were seen in our study (P=0.005) because of the modernization and sedentary lifestyle of people, there will be an increased risk of health issues. The IDRS and the characteristic variables were highly correlated (P < 0.001)A statistically significant association was found between IDRS and age, abdominal obesity, physical activity, and a family history of diabetes mellitus among parents, as reported by Kushal K et al. [14]. Oruganti A et al. [15] also reported in their study that sedentary activity is a significant risk factor for diabetes. This difference was found to be statistically significant (P < 0.0001). Weight gain and regular eating were likewise associated with a high and moderate risk of diabetes, as observed in our study (P < 0.001). High correlation was also observed in screen time use and sleep habit during COVID 19 with potential risk of developing diabetes in the future. Tiwari A et al. [16] had observed that 30.8% indicated a change in food and sleeping schedule. Lockdown during the COVID-19 pandemic has brought in a series of challenges in diabetes self-care, compelling individuals to remain indoors, leading to low physical activity, limitation in food availability, non-availability of anti-diabetic medications, and not being able to visit their treating doctors.

To identify undiagnosed high-risk diabetic individuals within the Indian population, this study outlines the implementation of the Indian Diabetes Risk Score. Preventing diabetes would require extensive information, education, and communication activities at the community level. In our study, we found a greater percentage of moderate and high risk of diabetes under IDRS, which reassures that diabetes mellitus is not a “rich man’s disease” anymore. Our study also demonstrated just how easy it is to use IDRS at the community-based level for predicting the risk.

Conclusion

In conclusion, the present study reveals a high prevalence of diabetes risk factors among individuals residing in Lucknow. Lifestyle modification and taking precautions can be implemented in the high-risk group by utilizing a cost-effective IDRS tool that identifies both modifiable and non-modifiable risk factors. These can thus create awareness of their risk of developing diabetes.

In the setting of metabolic disorder development or deterioration, weight gain is a significant consideration. The SARS-CoV-2 pandemic lockdown can have a negative effect on weight and increase the threat of metabolic decompensation in patients.

For the detection of high-risk persons who are prone to developing diabetes, screening of adults over the age of 30 years should be done regularly by an affordable tool like the IDRS. For high-risk individuals, it is recommended that effective primary and secondary preventive interventions be developed, incorporating dietary and lifestyle modifications.

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