

**A CROSS SECTIONAL STUDY ON THE SLEEP PATTERN AND DIETARY
HABITS AMONG MNC EMPLOYEES (WORKING IN HYBRID MODE) AND ITS
IMPACT ON THE BODY WEIGHT**

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Running Title: A cross-sectional study on the sleep pattern and dietary habits among MNC employees (working in the hybrid mode) and its impact on the body weight.

ABSTRACT

Background: Sleep is essential for preserving health and well-being, and financial, educational, and cultural factors all have an impact on eating patterns. Comprehending the effects of hybrid work modes and the growing incidence of overweight and obesity on sleep cycles and eating habits is crucial.

Methodology: Using statistical techniques such as descriptive analysis and the Bonferroni post-hoc test, the study polled 183 MNC employees aged 25 to 35 years old using the Pittsburgh Sleep Quality Index and the Eating Habits questionnaire.

Results: The study's findings will provide valuable insights into the relationship between sleep patterns, dietary habits, and body weight among employees. The study concluded that 127(69.4%) individuals are non-vegetarian, 120 (65.6%), eating fried and fast foods, 95 (51.95%) struggling with the food cravings, 94 (51.9%) skipping meals and 55 (30.1%), go to bed late at night, 81(44.3%) takes 30 minutes to fall asleep and the hours of actual sleep they get is only 6-7 hours in (44.3%). 31(73.2%) reporting fairly good sleep quality, 53(29.0%) reported trouble staying awake, 54 (29.5%) facing problems to keep up the things enough enthusiasm to get things done.

Conclusion: This study investigates the relationship between workers' sleep patterns, eating habits, and body weight and offers evidence-based suggestions for preserving a healthy work environment.

Keywords: Sleep patterns, dietary habits, body weight, employees, cross-sectional study.

INTRODUCTION

Sleep is an essential aspect of existence, defined as a mental state of conceptual disengagement with minimal responses to the surroundings. (1) Sleep is crucial for human health and wellness, preserving mental clarity, emotional stability, and physical health. In the modern workplace, long working hours and multitasking can hinder work-life balance. Ensuring adequate sleep and a healthy diet are essential for overall health and wellbeing.(2) Sleep and a healthy diet are essential for maintaining mental clarity, emotional stability, and physical health, especially in the modern workplace, where long working hours can hinder balance.(3)

Sleep quality was found to be substantially correlated with eating behaviours and meal timing. We hypothesize that who follow a healthy diet may experience an improvement in the quality and composition of their sleep. (4, 5) Sleep quality is crucial for functional, psychological, and emotional health. Consumption of sweets, sugars, and carbs leads to poor sleep, while vegetables and oily fish improve it. (7) Sleep disorders increase the risk of chronic health issues like endocrine disruption, psychological disturbance, and cardiovascular disease. Lifestyle choices and dietary habits are key factors in sleep quality and quantity, impacting bodily systems' function, memory, vision, body temperature regulation, and brain energy regeneration.(8)

The Dietary patterns rather than specific diet elements (such as fat intake) may be a better indicator of illness risk. Researchers have also found that those who sleep for shorter periods of time consume more total energy, fat, sugar, and alcohol.(9) Certain food patterns have been found in preliminary research to have a significant impact on both the quantity and quality of sleep at night in addition to their effects on daytime alertness.(10)

A poorer diet, defined as higher intakes of energy, total fat, saturated fat, added sugars, caffeine, and food by weight, and lower intakes of protein, unsaturated fat, fiber, fruits and vegetables (FV), dairy, whole grains, and fish, would be linked to poorer sleep quality, longer sleep-onset latency, and more severe insomnia.(11) Bad eating habits in adults are linked to prolonged sitting and exposure to food marketing through screen devices. Healthy dietary patterns and active lifestyles are associated with lower disease risk. Sleeping later leads to skipped breakfast, fast food consumption, and sugar-sweetened drinks.(12)

The prevalence of obesity, excess weight, and associated ailments has emerged as a global concern. Researchers have concentrated on assessing the relationship between the nutritional quality of food intake and health outcomes because of the strong correlation shown between poor diet quality and weight increase.(5) Weight is closely correlated with eating behavior. The recommended ratios of fruit and vegetables, with a large drop in the amount of bread and vegetables ingested and a considerable rise in the intake of fat and alcohol contributes to weight gain in employees.(6)

To combat the rising incidence of overweight and obesity in the general population, conducting programs aimed at preventing unhealthy eating habits among employees are essential. The chance of being obese later in life is decreased by adopting healthy lifestyle practices, increasing physical activity, and changing eating habits. Over time, dietary habits appear to hold true. An unhealthy diet that is low in fruits and vegetables, has erratic eating patterns, and frequently consists of fast food options is concerning since the eating habits formed during this stage of life can have a significant impact on an individual's long-term health.(6)

MATERIALS AND METHODS

A cross-sectional study on the sleep pattern and dietary habits among MNC employees (working in the hybrid mode) and its impact on the body weight in Hyderabad.

Sample size: 183

Sampling technique: Employees were selected using convenient sampling.

Inclusion criteria: The corporate female and male employees working in hybrid mode in the MNC sector of age 25-35 years

Exclusion criteria: The subjects with metabolic disorders like diabetes and pregnant woman, lactating mother ,post operative patients and people who are having regular office and people who are completely working from home

Statistical Analysis: Descriptive analysis was carried out by frequency and proportion for categorical variables. Continuous variables were presented as Mean $\pm$ SD. The chi-square/Fisher exact test was used to test the statistical significance of cross-tabulation between categorical variables. One-way ANOVA with the Bonferroni post-hoc test was used to compare the Mean $\pm$ SD of continuous variables between more than two groups.

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RESULTS

Table 1: Descriptive analysis of Age (N=183)

Age	Frequency	Percentages
25 to 30	148	80.87%
31 to 35	35	19.13%

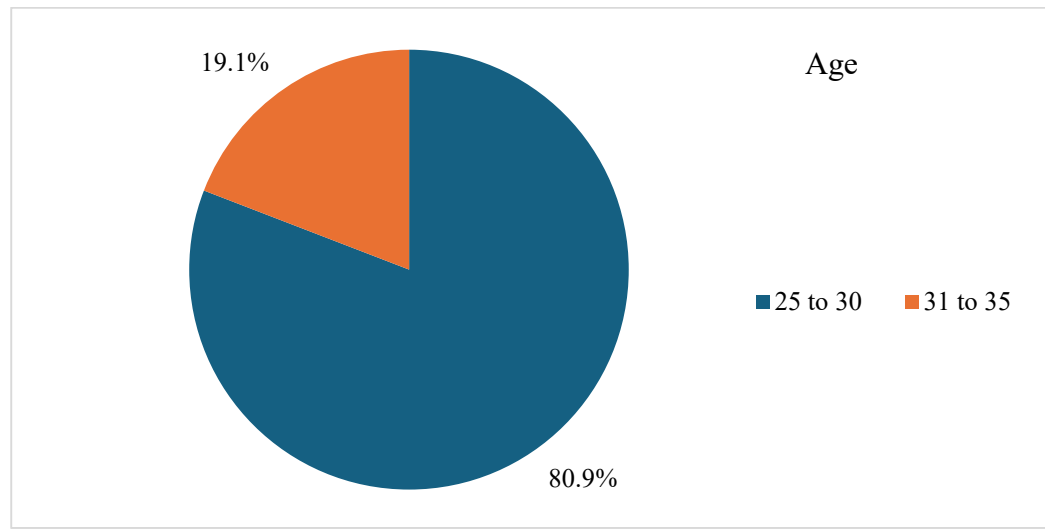


Figure 1: Descriptive analysis of Age

Table 2: Descriptive analysis of Gender in the study population (N=183)

Gender	Frequency	Percentages
Male	105	57.38%
Female	78	42.62%

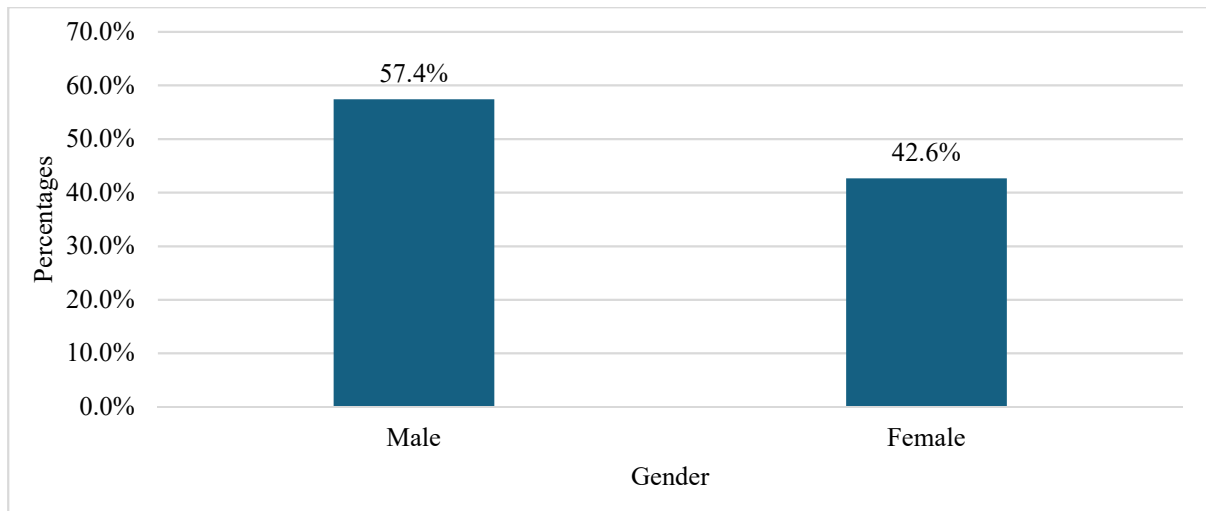


Figure 2: Descriptive analysis of Gender in the study population

Table 3: Descriptive analysis of Education in the study population (N=183)

Education	Frequency	Percentages
UG	97	53.01%
PG	86	46.99%

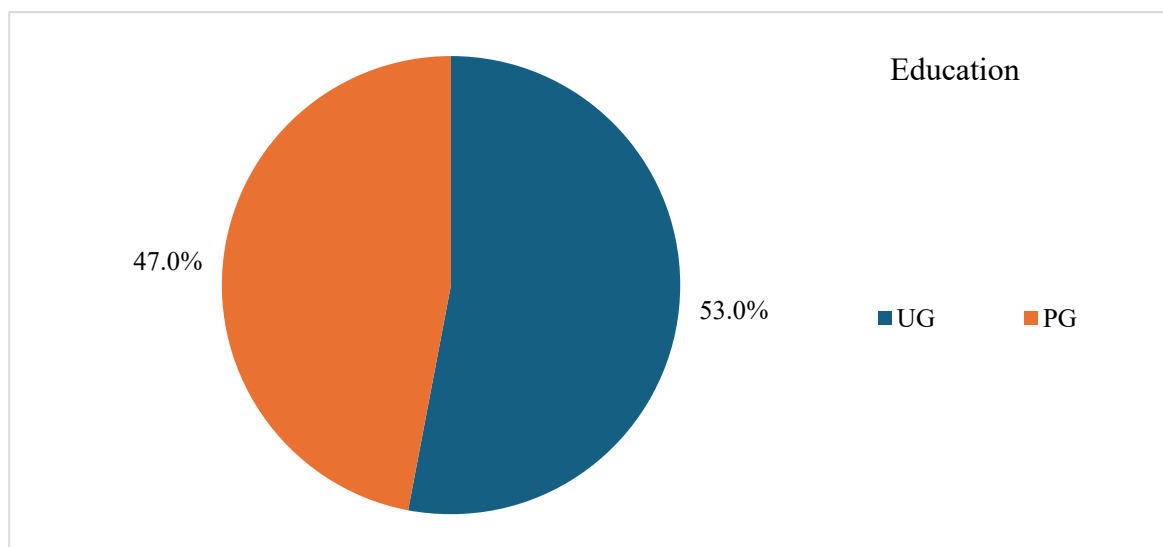


Figure 3: Descriptive analysis of Education in the study population

Table 4: Descriptive analysis of weight in the study population (N=183)

Weight	Frequency	Percentages
Less than 70 kg	101	55.19%
71-75 kg	43	23.50%

Above 76 kg	39	21.31%
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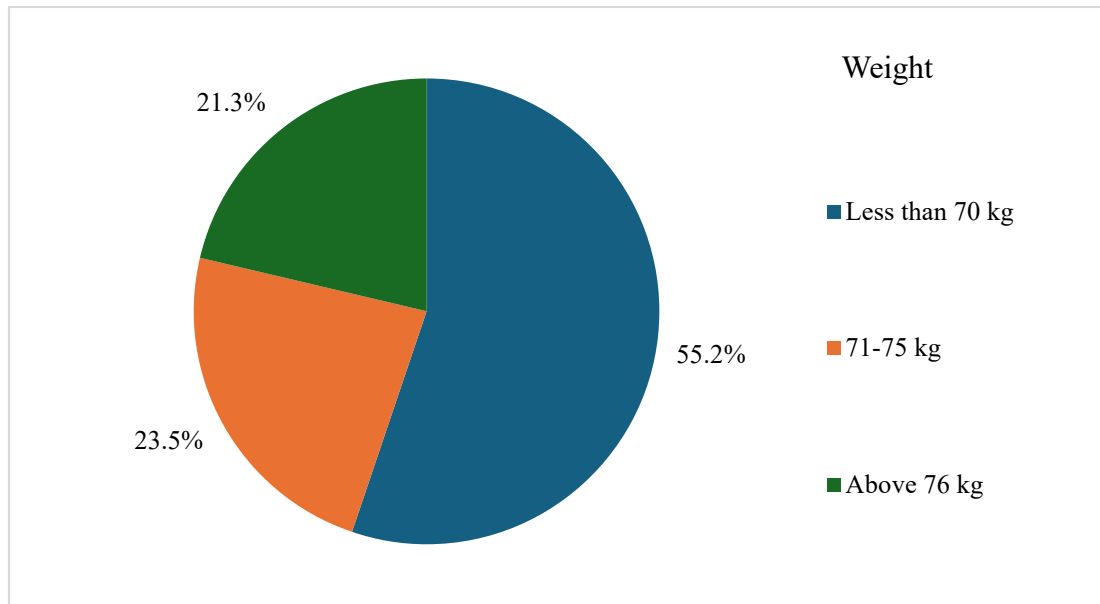


Figure 4: Descriptive analysis of weight in the study population

Table 5: Descriptive analysis of Height in the study population (N=183)

Height	Frequency	Percentages
Less than 5 feet 7 inches	106	57.92%
5feet 8 inches to 5 feet 9 inches	44	24.04%
Above 5 feet 9 inches	33	18.03%

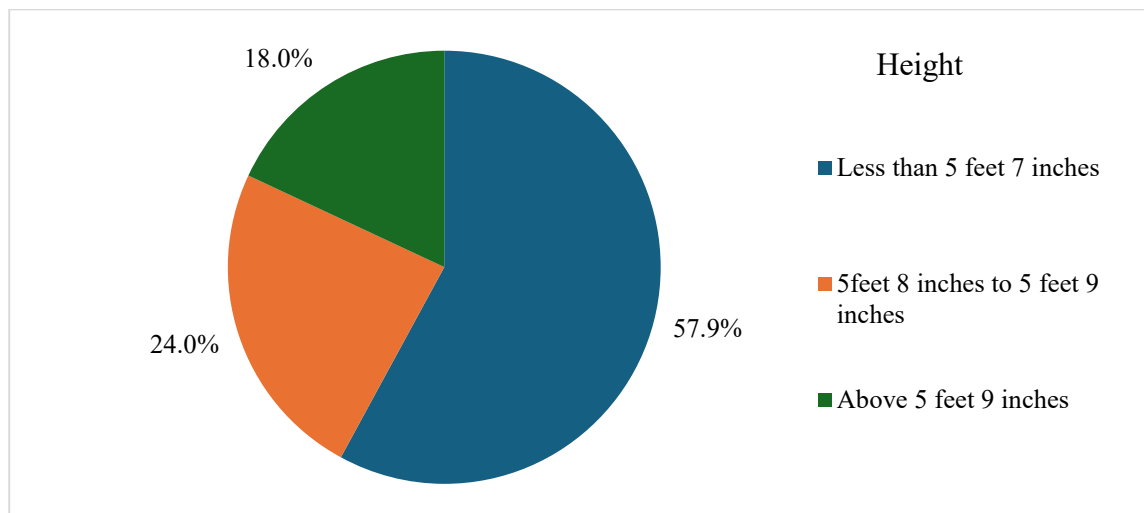


Figure 5: Descriptive analysis of Height in the study population

Table 6: Descriptive analysis of Eating Habit variables in the study population (N=183)

Eating Habit Questionnaire	Frequency	Percentage s
Are You A Vegetarian Or Non- Vegetarian		
Vegetarian	56	30.6%
Non- vegetarian	127	69.4%
How Many Meals Do You Usually Eat Per Day?		
One	3	1.6%
Two	53	29.0%
Three	114	62.3%
Four	6	3.3%
Above four	7	3.8%
Where Do You Mainly Have A Meal?		
At home	152	83.1%
At Work	30	16.4%
At Restaurant	1	0.5%
Which Kind Of Food Do You Prefer?		
Chinese	2	1.1%
Indian	180	98.4%
Italian	1	0.5%
Are You Interested In Following Good Dietary Habits?		

Extremely Interested	64	35.0%
very Interested	62	33.9%
Somewhat Interested	50	27.3%
Slightly Interested	7	3.8%
Do You Take Any Supplements On A Daily Basis?		
Yes	23	12.6%
No	160	87.4%
What Meal Would You Consider To Be Your Main Meal Of The Day?		
Breakfast	27	14.8%
Lunch	132	72.1%
Dinner	23	12.6%
Other	1	0.5%
What Type Of Meal Do You Prefer?		
Freshly home cooked meal	179	97.8%
Restaurant meal	4	2.2%
Have You Been Avoiding Some Foods For Any Health Reasons?		
Yes	55	30.1%
No	128	69.9%
Do You Have Any Particular Food Allergies?		
Yes	28	15.3%
No	155	84.7%
How Many Teaspoons Of Sugar Do You Add To Your Beverages Or Food Each Day?		
One teaspoon	92	50.3%
Two teaspoons	67	36.6%
Three teaspoons	17	9.3%
Four teaspoons	7	3.8%
How Often Do You Eat The Fried Foods And Fast Foods?		
Daily	3	1.6%
Once a week	120	65.6%
One to three times per week	53	29.0%
Four to six times per week	7	3.8%

How Much Coffee/Tea Do You Drink A Day?		
One to two cups a day	87	47.5%
Three to four cups a day	15	8.2%
Five to six cups a day	1	0.5%
None	80	43.7%
How Often Do You Eat In A Restaurant?		
None	55	30.1%
One to two times per week	108	59.0%
Three to four times per week	17	9.3%
Five to six times per week	2	1.1%
More than the six times per week	1	0.5%
Do You Normally Struggling With Food Cravings?		
Yes often	46	25.1%
Sometimes its depend	95	51.9%
No rarely	42	23.0%
How Often Do You Skip Meals Or Purposely Go A Long Time Without Eating?		
Almost always	19	10.4%
Sometimes	94	51.4%
Often	13	7.1%
Rarely	57	31.1%
How Often Do You Eat Fruits?		
Daily	42	23.0%
Once in a week	73	39.9%
Twice in a week	33	18.0%
More than twice in a week	35	19.1%
How Often Do You Include The Green Leafy Vegetables In Your Meals?		
Daily	32	17.5%
Once in a week	65	35.5%
Twice in a week	43	23.5%
More than twice in a week	43	23.5%

Figure 6: Descriptive analysis of Eating Habit variables in the study population**Table 7: Descriptive analysis of Pittsburgh sleep quality variables in the study population (N=183)**

Pittsburgh sleep quality variables	Frequenc y	Percentage s
During The Past Month, What Time Have You Usually Gone To Bed At Night?		
9-10 pm	19	10.4%
10-11 pm	55	30.1%
11-12 pm	54	29.5%
12-1am	55	30.1%
During The Past Month, How Long (In Minutes) Has It Usually Takes You To Fall Asleep Each Night?		
<15 minutes	59	32.2%
16-30 minutes	81	44.3%
31-60 minutes	24	13.1%
>60 minutes	19	10.4%
During The Past Month, What Time Have You Usually Gotten Up In The Morning?		
6-7 am	80	43.7%
7-8 am	52	28.4%
8-9 am	18	9.8%
9-10 am	19	10.4%
>10 am	14	7.7%
During The Past Month, How Many Hours Of Actual Sleep Did You Get At Night?		
<5 hours	17	9.3%
5-6 hours	38	20.8%
6-7 hours	81	44.3%
>7 hours	47	25.7%

Table 8: Descriptive analysis of Pittsburgh sleep quality variables in the study population (N=183)

During the past month, how often have you had trouble in sleeping because you	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
Cannot get to sleep within 30 minutes	71 (38.8%)	43 (23.5%)	30 (16.39%)	39 (21.31%)
Wake up in the middle of the night or early morning	71 (38.8%)	50 (27.32%)	35 (19.13%)	27 (14.75%)
Have to get up to use the bathroom	63 (34.43%)	50 (27.32%)	44 (24.04%)	26 (14.21%)
Cannot breathe comfortably	130 (71.04%)	32 (17.49%)	11 (6.01%)	10 (5.46%)
Cough or snore loudly	120 (65.57%)	31 (16.94%)	21 (11.48%)	11 (6.01%)
Had bad dreams	96 (52.46%)	55 (30.05%)	21 (11.48%)	11 (6.01%)
Have pain	98 (53.55%)	46 (25.14%)	26 (14.21%)	13 (7.1%)
Feel too cold or too hot	111 (60.66%)	36 (19.67%)	24 (13.11%)	12 (6.56%)

Table 9: Descriptive analysis of Pittsburgh sleep quality variables in the study population (N=183)

Variables	Frequency	Percentages
During The Past Month, How Would You Rate Your Sleep Quality Overall?		
Very good	38	20.8%
Fairly good	134	73.2%
Fairly bad	10	5.5%

Very bad	1	0.5%
During The Past Month, How Often Have You Taken Medicine To Help You Sleep?		
Not during the past month	160	87.4%
Less than once a week	13	7.1%
Once or twice a week	7	3.8%
Three or more times a week	3	1.6%
During The Past Month, How Often Have You Had Trouble Staying Awake While Driving, Eating Meals, Or Engaging In Any Social Activity?		
No problem at all	109	59.6%
Only a very slight problem	53	29.0%
Somewhat of a problem	19	10.4%
A very big problem	2	1.1%
During The Past Month, How Much Of A Problem Has It Been For You To Keep Up Enough Enthusiasm To Get Things Done?		
No problem at all	101	55.2%
Only a very slight problem	54	29.5%
Somewhat of a problem	26	14.2%
A very big problem	2	1.1%

Table 10: Descriptive analysis of Pittsburgh sleep quality variables in the study population (N=183)

If you have a roommate or bed partner, ask him/her how often in the past month you have had	Not during the past month	Less than once a week	Once or twice a week	Three or more times a week
Loud snoring	139 (75.96%)	19 (10.38%)	14 (7.65%)	11 (6.01%)
Long pauses between breaths while asleep	139 (75.96%)	31 (16.94%)	8 (4.37%)	5 (2.73%)
Legs twitching or jerking while you sleep	136 (74.32%)	31 (16.94%)	12 (6.56%)	4 (2.19%)

Episodes of disorientation or confusion during sleep	135 (73.77%)	27 (14.75%)	13 (7.1%)	8 (4.37%)
Other restlessness while you sleep, please describe	123 (67.21%)	30 (16.39%)	21 (11.48%)	9 (4.92%)

Table 11: Descriptive analysis of PSQI Overall score in the study population (N=183)

Parameter	Mean $\pm$ SD	Median	Minimum	Maximum	95% CI	
					Lower	Upper
PSQI (Overall score)	6.63 $\pm$ 3.15	6.00	0.00	16.00	6.17	7.09

Table 12: Comparison between Weight and PSQI Overall score in the study population (N=183)

Weight	PSQI (Overall score)	P-value (One-way ANOVA)
	(Mean $\pm$ SD)	
Less than 70 kg (n=101)	6.38 $\pm$ 3.04	0.018
71-75 kg (n=43)	6.09 $\pm$ 2.81	
Above 76 kg (n=39)	7.87 $\pm$ 3.55	

Table 13: Comparison between Dietary habits and weight in the study population (N=183)

Dietary Habit variables	Weight			P value
	Less than 70 kg	71-75 kg	Above 76 kg	
Are You A Vegetarian Or Non- Vegetarian				
Vegetarian (N=56)	32 (57.14%)	16 (28.57%)	8 (14.29%)	0.246
Non- Vegetarian (N=127)	69 (54.33%)	27 (21.26%)	31 (24.41%)	
How Many Meals Do You Usually Eat Per Day?				

One (N=3)	2 (66.67%)	1 (33.33%)	0 (0%)	0.021
Two (N=53)	30 (56.6%)	10 (18.87%)	13 (24.53%)	
Three (N=114)	66 (57.89%)	23 (20.18%)	25 (21.93%)	
Four (N=6)	2 (33.33%)	4 (66.67%)	0 (0%)	
Above Four (N=7)	1 (14.29%)	5 (71.43%)	1 (14.29%)	
Where Do You Mainly Have A Meal?				
At Home (N=152)	83 (54.61%)	39 (25.66%)	30 (19.74%)	0.449
At Restaurant (N=1)	1 (100%)	0 (0%)	0 (0%)	
At Work (N=30)	17 (56.67%)	4 (13.33%)	9 (30%)	
Which Kind of Food Do You Prefer?				
Chinese (N=2)	2 (100%)	0 (0%)	0 (0%)	0.649
Indian (N=180)	98 (54.44%)	43 (23.89%)	39 (21.67%)	
Italian (N=1)	1 (100%)	0 (0%)	0 (0%)	
Do You Take Any Supplements on A Daily Basis?				
Yes (N=23)	12 (52.17%)	8 (34.78%)	3 (13.04%)	0.315
No (N=160)	89 (55.63%)	35 (21.88%)	36 (22.5%)	
What Type of Meal Do You Prefer?				
Freshly Home Cooked Meal (N=179)	99 (55.31%)	41 (22.91%)	39 (21.79%)	0.348
Restaurant Meal (N=4)	2 (50%)	2 (50%)	0 (0%)	
How Many Teaspoons of Sugar Do You Add To Your Beverages Or Food Each Day?				
One Teaspoon (N=92)	56 (60.87%)	22 (23.91%)	14 (15.22%)	0.439
Two Teaspoon (N=67)	34 (50.75%)	15 (22.39%)	18 (26.87%)	

Three Teaspoon (N=17)	8 (47.06%)	5 (29.41%)	4 (23.53%)
Four Teaspoon (N=7)	3 (42.86%)	1 (14.29%)	3 (42.86%)

DISCUSSION

The study was conducted in the Hyderabad city of Telangana. One eighty three (183) employees of both sexes participated in the study. Here, I evaluated the cross sectional assessment of dietary habits and sleep pattern. A total of 183 employees aged 25-35 years have been analyzed in a survey. Eating habit questionnaire (EHQ) was use to assessed their dietary habits and sleep pattern was assessed by Pittsburgh sleep quality index (PSQI) and self reported weight and height and BMI was taken out. There are no such studies conducted on MNC employees especially in Hyderabad city. It is essential to their diet and sleep pattern in them because they are only the causes of many disorders in humans.

A study by Farris ME, et.al 2023 found that 498 students who ate late-night snacks, skipped breakfast, and substituted snacks for meals had a 1.20 times, 1.24 times, and 1.25 times increased risk of poor sleep quality, with skipping breakfast and snacking having the strongest independent associations.

The study reveals that 69.4% of employees are non-vegetarian, with 66.6% eating fried and fast foods. Food cravings and skipping meals increase the risk of poor sleep quality. Vegetarians have good sleep

quality, with only 16 participants struggling to fall asleep within 30 minutes. Sleep quality is a major factor in performance and quality of life, with a low quality rating for some participants.

The study found that many individuals go to bed late, take 30 minutes to fall asleep, and only get 6-7 hours of actual sleep. Dietary habits can disrupt sleep quality. A meta-analysis found that a high-quality diet and healthy foods are linked to better sleep quality, while processed and sugar-rich foods are linked to worse sleep quality.

CONCLUSION

The study discovered that a sizable portion of workers in multinational corporations (MNCs) reported insufficient sleep duration, poor quality, and frequent disturbances. These findings were connected to unhealthy eating patterns like eating processed foods, sugar, and irregular meal timings, indicating a possible interaction between sleep and eating patterns.

The study found a link between poor sleep patterns, unhealthy dietary habits, and higher body weight among employees, highlighting the need for workplace health promotion initiatives. It suggests adopting healthier sleep patterns, regular meal timings, and nutritious food choices can improve employee well-being and productivity.

MNCs should implement interventions like sleep education programs, flexible work schedules, and healthy food options to improve employee health. Physical activity and stress management techniques

can also enhance well-being. Further research is needed to understand the long-term effects of sleep patterns and dietary habits on body weight among hybrid work mode employees.

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AUTHORS' CONTRIBUTION

_____ designed the research, developed the research plan, and provided study oversight. _____ conducted the research, including experiments and data collection. _____ analysed the data and performed the statistical analysis. _____ wrote the manuscript and had primary responsibility for its final content. _____ and _____ provided guidance and assistance throughout the project. All authors have read and approved the final manuscript.

ABBREVIATIONS

MNC: Multi National Company

PSQI: Pittsburgh sleep quality index

EHQ: Eating habit questionnaire

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