

NUTRITIONAL HEALTH CHALLENGES AND LIFESTYLE PATTERNS AMONG NURSES IN THIRUVANANTHAPURAM, KERALA

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ABSTRACT

This research conducted in 2019-20, aimed to assess the lifestyle patterns and nutritional status of nurses using a crosssectional, comparative approach with purposive sampling. The study included 500 registered female nurses, aged 25–45 years, from government and private hospitals in rural and urban regions of Thiruvananthapuram city. Findings revealed unhealthy lifestyle habits among nurses in both sectors, including insufficient physical activity (72% in government hospitals; 78% in private hospitals), inadequate sleep (51% and 56%, respectively), insufficient work breaks and difficulty in managing worklife balance. Underweight conditions were observed in 41% of government and 47% of private hospital nurses, together with poor dietary practices (40% and 70%, respectively). Biochemical analyses revealed high prevalence rates of anemia (50% in both sectors), diabetes (33% and 25%) and hypercholesterolemia (42% in both). These findings underscore critical gaps in nurses' health and lifestyles, calling for urgent staff development initiatives and training programs by hospital authorities and policymakers to improve nurses' well-being and care quality.

Keywords: Dietary habits, Lifestyle patterns, Nutritional status, Work-life balance

INTRODUCTION

Nurses often face challenges in maintaining healthy lifestyles and dietary habits due to their demanding schedules. A key factor affecting health is lifestyle and as frontline health professionals, nurses play a vital role in combating various diseases. However, this also exposes them to a higher risk of developing health issues and related complications. The study seeks to examine lifestyle patterns and contributing factors

among nurses working shifts in hospitals across Thiruvananthapuram.

A study by Kumar *et al.*, (2023) highlights that lifestyle related disorders, including irregular sleep patterns, poor eating habits, meal skipping and lack of physical activity are strongly associated with shift work, contributing to deteriorating health. The demanding work environment and unpredictable nature of nursing tasks expose nurses to numerous work related risks, which can have long term health consequences.

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Additionally, healthcare workers, particularly nurses, have played a critical role in managing the COVID-19 pandemic. As frontline workers, nurses are at higher risk of exposure to the virus, with both the illness and its lingering effects posing significant health challenges (Cheng *et al.*, 2024).

The global COVID-19 pandemic has significantly impacted healthcare workers, with nurses facing a higher incidence of illness due to their frontline roles. Despite the growing concerns surrounding the health and wellbeing of nurses, a thorough examination of their lifestyle patterns and nutritional status remains underexplored. Given the critical role nurses play in healthcare systems, this study aims to assess the lifestyle behaviors, dietary habits and overall nutritional status of nurses in Thiruvananthapuram, in light of the ongoing challenges they face in their demanding profession.

MATERIAL AND METHODS

This study employed a cross-sectional, comparative design, utilizing a purposive sampling method. The sample consisted of 500 registered female nurses, aged 25–45 years, working in both government and private hospitals located in rural and urban areas of Thiruvananthapuram city, Kerala, India.

Data collection took place over a span of more than one and a half years which is from February, 2019- August 2020, across government and private hospitals in both rural and urban settings within Thiruvananthapuram, Kerala. After obtaining necessary permissions from relevant authorities, the investigator personally contacted participants, coordinating with the Nursing Superintendent of the respective hospitals to schedule a convenient time for data collection. The study purpose was explained to the nurses and interviews were conducted at their workplaces towards the end of shifts to minimize disruption. A structured

interview schedule assessed lifestyle patterns, including physical activity (exercise habits, types and duration), sleep (duration, quality, satisfaction and improvement methods) and social/family relationships.

Physical activity scores were derived based on participants' responses regarding their exercise habits, including the type of exercise and its duration. Since the physical activity parameters could not be converted into a continuous scale, each question was categorized accordingly. Sleep scores were calculated based on the duration of sleep, sleep quality, and the time taken to fall asleep, with individual scores assigned to each variable and the overall score reflecting the individual's sleep pattern. Additionally, thirteen statements, considered significant by experts, were identified concerning social relationships, leisure activities, child upbringing and interactions with family and friends. Participants' responses to these statements were recorded on a 3-point scale (yes/no/sometimes), with scores allotted for each response and a compounded score was then calculated. Nutritional status was evaluated using anthropometric (height, weight, waist/hip circumference, BMI, WHR), biochemical (hemoglobin, total cholesterol, HbA1c), dietary and clinical assessments.

The clinical symptoms experienced by shift workers were compiled from relevant literature (Belczak *et al.*, 2018) and validated with input from medical experts. The schedule included a range of measurement parameters, organized as a checklist. To assess the health status of the participants, blood pressure readings were taken using an automated digital blood pressure monitor.

RESULTS AND DISCUSSION

The study encompassed 500 nurses working in government and private hospitals across Thiruvananthapuram. A summary of the

Table 1. Demographic details of the respondents

n=500

Particulars	Government hospitals (n=250)			Private hospitals (n=250)		
	Rural n=125	Urban n=125	Total	Rural n=125	Urban n=125	Total
Age(yrs)						
25-30	26(10.4)	16(6.4)	42(16.8)	38(15.2)	45(18.0)	83(33.2)
31-35	27(10.8)	58(23.2)	85(34.0)	64(25.6)	61(24.4)	125(50.0)
36-40	20(8.0)	16(6.4)	36(14.4)	17(6.8)	14(5.6)	31(12.4)
41-45	52(20.8)	35(14.0)	87(34.8)	6(2.4)	5(2.0)	11(4.4)
Religion						
Hinduism	79(31.6)	94(37.6)	173(69.2)	97(38.8)	94(37.6)	191(76.4)
Christianity	26(10.4)	17(6.8)	43(17.2)	25(10.0)	31(12.4)	56(22.4)
Islam	20(8.0)	14(5.6)	34(13.6)	3(1.2)	0(0.0)	3(1.2)
Years of Experience						
Up to 5yrs	36(14.4)	47(18.8)	83(33.2)	19(7.6)	24(9.6)	43(17.2)
>5-10years	34(13.6)	47(18.8)	81(32.4)	71(28.4)	85(34.0)	156(62.4)
>10-15 years	18(7.2)	14(5.6)	32(12.8)	26(10.4)	16(6.4)	42(16.8)
>15 years	37(14.8)	17(6.8)	54(21.6)	9(3.6)	0(0.0)	9(3.6)
Occupational status						
Head Nurse	20(8.0)	11(4.4)	31(12.4)	16(6.4)	36(14.4)	52(20.8)
Staff nurse grade1/ Senior SN	25(10.0)	12(4.8)	37(14.8)	13(5.2)	0(0.0)	13(5.2)
Staff nurse grade 2/ Junior SN	80(32.0)	102(40.8)	182(72.8)	96(38.4)	89(35.6)	185(74.0)
Marital status						
Married	114(45.6)	94(37.6)	208(83.2)	115(46.0)	106(42.4)	221(88.4)
Unmarried	9(3.6)	31(12.4)	40(16.0)	8(3.2)	19(7.6)	27(10.8)
Widowed	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
Divorced	2(0.8)	0(0.0)	2(0.8)	0(0.0)	0(0.0)	0(0.0)
Separated	0(0.0)	0(0.0)	0(0.0)	2(0.8)	0(0.0)	2(0.8)
Bonded agreement in job						
Yes	35(14.0)	33(13.2)	68(27.2)	1(0.4)	15(6.0)	16(6.4)
No	90(36.0)	92(36.8)	182(72.8)	124(49.6)	110(44.0)	234(93.6)

Particulars	Government hospitals (n=250)			Private hospitals (n=250)		
	Rural n=125	Urban n=125	Total	Rural n=125	Urban n=125	Total
Type of family						
Nuclear	105(42.0)	115(46.0)	220(88.0)	110(44.0)	109(43.6)	219(87.6)
Joint	20(8.0)	10(4.0)	30(12.0)	13(5.2)	15(6.0)	28(11.2)
Extended	(0.00)	(0.00)	(0.00)	2(0.8)	1(0.4)	3(1.2)
Monthly Salary(Rs.)						
5000-10000	3(1.2)	6(2.4)	9(3.6)	0(0.00)	0(0.00)	0(0.00)
10000-15000	25(10.0)	8(3.2)	33(13.3)	3(1.2)	4(1.6)	7(2.8)
150001-20000	3(1.2)	13(5.2)	16(6.4)	29(11.6)	17(6.8)	46(18.4)
20001-30000	29(11.6)	19(7.6)	48(19.3)	93(37.2)	104(41.6)	197(78.8)
30001-40000	30(11.6)	52(20.9)	82(32.5)	0(0.00)	0(0.00)	0(0.00)
Above 40000	35(14.1)	27(10.8)	62(24.9)	0(0.00)	0(0.00)	0(0.00)

Number in parenthesis indicates percentage

demographic characteristics of the nurses is presented in Table 1. Demographic profiles provide insights into the diverse characteristics of a specific population, enabling a generalized understanding of the study group.

As observed in Table 1, 34.8% of respondents in government hospitals fell within the age category of 40-45 years, while in the private sector, nearly half (50%) of the participants were from the 30-35 years age group. The majority of respondents in both government (69.2%) and private hospitals (76.4%) belong to the Hindu religion.

In terms of job roles, most respondents in government hospitals (72.8%) were classified under the 'Staff Nurse Grade 2' category, whereas in private hospitals (74%) they were categorized as 'Junior Staff Nurses.' Marital status data revealed that the majority of participants were married, with 83.2% in government hospitals and 88.4% in private hospitals.

Regarding employment agreements, a significant proportion of respondents in government hospitals (72.8%) and private hospitals (93.6%) were not bound by any bonded agreements with their employers. Family structure analysis showed that most respondents were from nuclear families, comprising 88% in government hospitals and 87.6% in private hospitals.

In terms of income levels, 32.5% of government hospital respondents earned between Rs. 30,001 and Rs. 40,000 per month, while the majority of private hospital respondents (78.8%) fell into the salary range of Rs.20,001 to Rs.30,000 per month.

As per the table 2, the findings revealed that the majority of nurses in both private hospitals (78%) and government hospitals (72%) did not engage in any form of exercise. Among those who participated in physical activity, walking emerged as the most preferred choice, with 18% of nurses in government

Table 2. Physical activities of the respondents

n=500

Particulars	Government hospitals (n=250)			Private hospitals (n=250)		
	Rural n=125	Urban n=125	Total	Rural n=125	Urban n=125	Total
Frequency of Exercise						
Regularly	43(17.2)	24(9.6)	67(26.8)	18(7.2)	27(10.8)	45(18.0)
Never	82(32.8)	98(39.2)	180(72.0)	100(40.0)	95(38.0)	195(78.0)
Sometimes	-	3(1.2)	3(1.2)	7(2.8)	3(1.2)	10(4.0)
Total	125(50.0)	125(50.0)	250(100.0)	125(50.0)	125(50.0)	250(100.0)
Type of exercise						
Aerobic	-	5(2.0)	5(2.0)	1(0.4)	1(0.4)	2(0.8)
Dancing	-	2(0.8)	2(0.8)	-	-	-
Physical exercise	6(2.4)	3(1.2)	9(3.6)	8(3.2)	7(2.8)	15(6.0)
Walking	35(14.0)	10(4.0)	45(18.0)	14(5.6)	19(7.6)	33(13.2)
Yoga	2(0.8)	7(2.8)	9(3.6)	2(0.8)	3(1.2)	5(2.0)
Total	43(17.2)	27(10.8)	70(28.0)	25(10.0)	30(12.0)	55(22.0)
Duration of involvement per day						
<1hr	27(10.8)	13(5.2)	40(16.0)	22(8.8)	23(9.2)	45(18.0)
1-2hrs	10(4.0)	11(4.4)	21(8.4)	3(1.2)	7(2.8)	10(4.0)
2-3 hrs	6(2.4)	3(1.2)	9(3.6)	-	-	-
Total	43(17.2)	27(10.8)	70(28.0)	25(10.0)	30(12.0)	55(22.0)

Number in parenthesis indicates percentage

hospitals and 13% in private hospitals opting for it. Similarly, a recent study by Zhao *et al.*, (2022) highlighted that healthcare workers, particularly shift workers, often reported walking as their primary form of physical activity, but their involvement in other types of exercise or sports activities remained minimal.

Additionally, the duration of exercise among nurses was generally short, with most respondents in government hospitals (16%) and private hospitals (18%) exercising for less than an hour per session. These findings

underscore that physical activity levels among nurses are relatively low, which may have implications for their overall health and wellbeing.

According to table 3, 20 percent of nurses from government hospitals and 22 percent from private hospitals, reported sleeping for less than 5 hours. This inadequate sleep duration adversely impacts their health. Sleep deprivation and resulting fatigue were prevalent among these healthcare professionals, affecting their decision-making

Table 3. Sleeping pattern of the respondents

n=500

Particulars	Government hospitals (n=250)			Private hospitals (n=250)		
	Rural n=125	Urban n=125	Total	Rural n=125	Urban n=125	Total
Sleep						
<5hrs	35(14.0)	16(6.4)	51(20.4)	21(8.4)	35(14.0)	56(22.4)
5 to 7 hrs	88(35.2)	94(37.6)	182(72.8)	95(38.0)	74(29.6)	169(67.6)
Irregular sleep duration	2(0.8)	15(6.0)	17(6.8)	9(3.6)	16(6.4)	25(10.0)
Total	125(50.0)	125(50.0)	250(100.0)	125(50.0)	125(50.0)	250(100.0)
Time taken to fall asleep						
Sudden sleep	67(26.8)	87(34.8)	154(61.6)	101(40)	65(26.0)	166(66.4)
1/2 an hr	41(16.4)	23(9.2)	64(25.6)	21(8.4)	31(12.4)	52(20.8)
1hr	12(4.8)	15(6.0)	27(10.8)	3(1.2)	22(8.8)	25(10.0)
2hrs	-	-	-	-	7(2.8)	7(2.8)
3 or more hrs	5(2.0)	-	5(2.0)	-	-	-
Total	125(50.0)	125(50.0)	250(100.0)	125(50.0)	125(50.0)	250(100.0)
Sound sleep						
Yes	64(26)	82(32.8)	146(58.4)	68(27.2)	58(23.2)	126(50.4)
No	58(23)	31(12.4)	89(35.6)	38(15.2)	42(16.8)	80(32.0)
Sometimes	3(1.2)	12(4.8)	15(6.0)	19(7.6)	25(10.0)	44(17.6)
Total	125(50.0)	125(50.0)	250(100.0)	125(50.0)	125(50.0)	250(100.0)

Number in parenthesis indicates percentage

abilities, planning skills and alertness. A small proportion of nurses in government (6.8%) and private (10%) hospitals reported irregular sleep patterns.

Research has shown that insufficient sleep is linked to cognitive impairments, mood disturbances, diminished job performance, reduced motivation, increased safety risks and physiological changes. Consecutive night shifts were found to significantly increase fatigue among nurses. Additionally, sleep disturbances and the effects of aging are

common challenges faced by shift workers (Suh *et al.*, 2023).

The majority of nurses in both government (62%) and private hospitals (66%) reported falling asleep quickly once they went to bed, likely due to the long working hours and exhaustion. Furthermore, 58% of government and 50% of private hospital nurses indicated that they experienced sound sleep. However, these findings contrast with other research studies. For instance, Patel *et al.*, (2023) examined sleep patterns among nurses and identified that shift work and irregular

schedules were associated with a high prevalence of sleep disturbances and poor sleep quality among healthcare workers.

This study highlights that the impact of shift work on sleep among nurses in Thiruvananthapuram, in both government and private sectors, was not acknowledged as a significant issue by many respondents.

Table 4 provides an overview of the quality of social and family relationships among nurses in both government and private sectors. A significant proportion of nurses, 51.2% in government hospitals and 57.6% in private hospitals, reported being unable to share family meals together most of the time. The nature of shift work significantly impacted their social relationships, with many respondents acknowledging feelings of social isolation from friends. For some, the only way to maintain connections was through social media platforms.

In this study, 46% of nurses in government hospitals and 16.8% in private hospitals reported that their social relationships had deteriorated. Many nurses in the government sector experienced a noticeable decline in their interactions with family members, relatives and friends.

Other common challenges faced by nurses in both sectors included difficulties in managing responsibilities such as their children's education, addressing health concerns, handling house repairs and attending to other domestic duties. A key issue raised by many was the lack of time to spend with their children and family. As most nurses were married, they expressed concerns about their husbands and children, particularly during night shifts.

A small percentage of nurses in both government and private hospitals stated that their husbands did not fully understand the

stress caused by their work schedules. However, some nurses felt fortunate to have support from relatives to manage certain family responsibilities. The burden of shift work was especially pronounced for those whose family members were also engaged in shift based jobs.

The quality of social relationships was found to directly impact both mental and physical well-being. Nurses who lacked a regular routine faced greater difficulties in maintaining stable social and family connections.

To evaluate the potential association between shift work and the lifestyle activities of nurses, parameters such as physical activity scores, sleep scores and social and family relationship quality scores were analyzed. Based on the mean scores for sleep and social relationship quality, nurses from both sectors were categorized into three groups: low scores (below mean - S.D.), medium scores (from mean - S.D. to mean + S.D.) and high scores (above mean + S.D.).

The shift related variables considered for analysis included the number of shift changes per month, the number of night shifts per month and total work experience. These variables were assessed in relation to lifestyle parameters and the findings are presented in Table 5.

The data from table 5, indicates that 48 percent of nurses in government and those who had more than 6 hours of daily shift changes in a month had low physical activity score. Statistically significant difference was found between the scores and number of shifts ($p < .01$). In private hospitals 49 percent of nurses who had shifts of more than 6 shift changes in a month had low score but statistically no significant difference was found ($p = 0.01$). Fifty one percent of nurses in government hospitals and sixty percent of

Table 4. Status on social relationship of respondents**n=500**

Statements	Government hospitals (n=250)				Private hospitals (n=250)			
	Yes	No	Some- times	Total	Yes	No	Some- times	Total
Decline in social interactions and connectedness	115 (46)	47 (18.8)	88 (35.2)	250 (100)	42 (16.8)	65 (26)	143 (57.2)	250 (100)
Recreational and leisure activities is impaired	76 (30.4)	67 (26.8)	108 (43.2)	250 (100)	27 (10.8)	67 (26.8)	156 (62.4)	250 (100)
Decline in the maintenance of close relationship with family members and friends	100 (40)	63 (25.2)	87 (34.8)	250 (100)	42 (16.8)	74 (29.6)	134 (53.6)	250 (100)
Withdrawal and isolation from social gathering	71 (28.4)	89 (35.6)	90 (36)	250 (100)	27 (10.8)	93 (37.2)	130 (52)	250 (100)
Work pattern affected the child rearing and caring practices	27 (10.8)	62 (24.8)	113 (45.2)	202 (80.8)	18 (7.2)	53 (21.2)	118 (47.2)	189 (75.6)
Difficult to maintain balance between childcare and work	24 (9.6)	61 (24.4)	115 (46)	200 (80)	15 (6.0)	75 (30.0)	103 (41.2)	192 (77.2)
Unable to eat together with family	128 (51.2)	67 (27.8)	55 (22.0)	250 (100)	144 (57.6)	63 (25.2)	43 (17.2)	250 (100)
Forced to give up social gatherings even if invited or expected to attend	49 (19)	144 (57.6)	57 (22.8)	250 (100)	28 (11.2)	146 (58.4)	76 (30.4)	250 (100)
The stress inherent in nursing job is understood by spouse	12 (4.8)	36 (14)	201 (80.4)	249 (99.6)	11 (4.4)	30 (1.2)	208 (83.2)	249 (99.6)
Able to keep contact with old friends /distant relatives	22 (8.8)	116 (46.4)	112 (44.8)	250 (100)	28 (11.2)	134 (53.6)	88 (35.2)	250 (100)

Number in parenthesis indicates percentage

Table 5. Association of physical activity score and shift work n=500

Shift Variables	Govt. hospitals-Physical activity scores n=250			Private hospitals-Physical activity scores n=250		
	Low	Average	Good	Low	Average	Good
No. of monthly shifts change/month						
1-3	2(0.8)	10(4.0)	1(0.4)	19(7.6)	11(4.4)	1(0.4)
4-6	7(2.8)	15(6.0)	4(1.6)	53(21.2)	19(7.6)	3(1.2)
>6	121(48.4)	82(32.8)	8(3.2)	123(49.2)	20(8.0)	1(0.4)
Total	130(52.0)	107(42.8)	13(5.2)	195(52.0)	50(42.8)	5(5.2)
Chi square(p-value)	19.45(<.01) **					
No: night shift rotation/month						
2	127(50.8)	104(41.6)	13(5.2)	150(60.0)	40(16.0)	4(1.6)
3	3(1.2)	3(1.2)	0(0.00)	45(18.0)	10(4.0)	1(0.4)
Total	130(52.0)	107(42.8)	13(5.2)	195(78.0)	50(20.0)	5(2.0)
Chi square(p-value)	0.40(0.82)					
Years of experience						
Up to 10yrs	93(37.2)	63(25.2)	8(3.2)	155(62.0)	39(15.6)	5(2.0)
>10Yrs	37(14.8)	44(17.6)	5(2.0)	40(16.0)	11(4.4)	0(0.00)
Total	130(52.0)	107(42.8)	13(5.2)	195(78.0)	50(20.0)	2(2.0)
Chi square(p-value)	11.4(<.05) *					
Chi square(p-value)	4.3(0.12) 1.36(0.51)					

No. in parenthesis indicates percentage

* significant at 5% level of significance

**significant at 1% level of significance

Table 6. Association of sleep scores and shift work

n=500

Shift Variables	Govt. hospitals-Physical activity scores n=250			Private hospitals-Physical activity scores n=250		
	Low	Average	Good	Low	Average	Good
No. of monthly shiftschange/month						
1-3	4(1.6)	6(2.4)	3(1.2)	8(3.2)	14(5.6)	9(3.6)
4-6	7(2.8)	12(4.8)	7(2.8)	19(7.5)	22(8.8)	34(13.6)
>6	39(15.6)	69(27.6)	103(41.2)	15(6.0)	78(31.2)	51(20.4)
Total	50(20.0)	87(34.8)	113(45.2)	42(16.8)	114(45.6)	94(37.6)
Chi square (p-value)	7.3(0.122)			16.9(<.01) **		
No. of night shift rotation /month2						
3	1(0.4)	3(1.2)	2(0.8)	10(4.0)	31(12.4)	15(6.0)
Total	50(20.0)	87(34.8)	113(45.2)	42(16.8)	114(45.6)	94(37.6)
Chi square (p-value)	0.634(0.73)			4.6(0.13)		
Years of experience						
Up to 10yrs	39(15.6)	50(20.0)	75(30.0)	36(14.4)	96(38.4)	67(26.8)
>10yrs	11(4.4)	37(14.8)	38(15.2)	6(2.4)	18(7.2)	27(10.8)
Total	50(20.0)	87(34.8)	113(45.2)	42(16.8)	114(45.6)	94(37.6)
Chi square (p-value)	5.99 (<.05)*			6.47 (<.05)*		

Number in parenthesis indicates percentage

* significant at 5% level of significance

Table 7: Association of quality of social and family relations score with respect to shift work n=500

Shift Variables	Govt. hospitals-Quality of social and family relations scores n=250			Private hospitals-Quality of social and family relations scores n=250				
	Not affected	Moderately impaired	Highly impaired	Total	Not affected	Moderately impaired	Highly impaired	Total
No. of shifts change 1-3	1(0.4)	6(2.4)	6(2.4)	13(2.5)	7(2.8)	20(8.0)	4(1.6)	31(12.4)
4-6	1(0.4)	22(8.8)	3(1.2)	26(10.4)	19(7.6)	51(20.4)	5(2.0)	75(30.0)
>6	29(11.6)	157(62.8)	25(10.0)	211(84.4)	37(14.8)	96(38.4)	11(4.4)	144(57.6)
Total	31(12.4)	185(74.0)	34(13.6)	250(100.0)	63(25.2)	167(66.8)	20(8.0)	250(100.0)
<i>Chi square (p-value)</i>								
14.5(<.01) **								
No: of night shift rotation /month2	30(12.0)	181(72.4)	33(13.2)	244(97.6)	52(20.8)	126(50.4)	16(6.4)	194(77.6)
3	1(0.4)	4(1.6)	1(0.4)	6(2.4)	11(4.4)	41(16.4)	4(1.6)	56(22.4)
Total	31(12.4)	184(73.6)	34(13.6)	250(100.0)	63(25.2)	167(66.8)	20(8.0)	250(100.0)
<i>Chi square(p- value)</i>								
0.18(.92)								
Years of experience Up to 10yrs	21(8.4)	124(49.6)	19(7.6)	164(65.6)	53(21.2)	132(52.8)	14(5.6)	199(79.6)
>10yrs	10(4.0)	61(24.4)	15(6.0)	86(34.4)	10(4.0)	35(14.0)	6(2.4)	51(20.4)
Total	31(12.4)	185(74.0)	34(13.6)	250(100.0)	63(25.2)	137(54.8)	20(8.0)	250(100.0)
<i>Chi square(p- value)</i>								
1.65(.44)								

Number in parenthesis indicates percentage

* significant at 5% level of significance

** significant at 1% level of significance

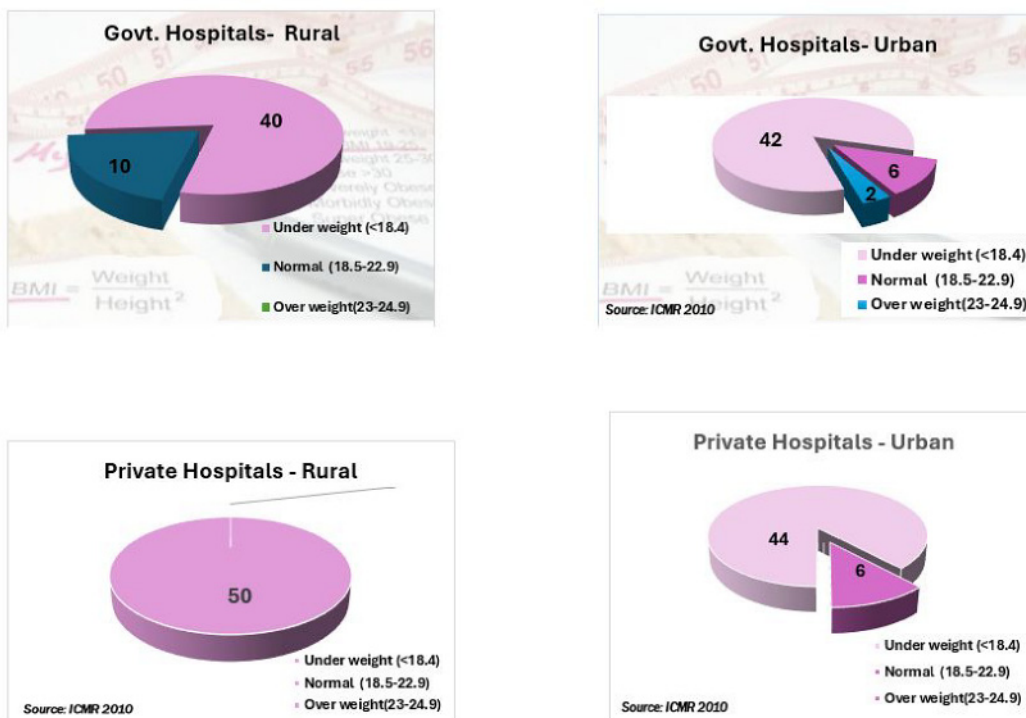


Fig.1. Distribution of respondents according to Body Mass Index (BMI)

nurses in private hospitals who took 2 night rotations in a month had low score. In government hospital no significant association was found ($p = 0.82$) between night shift and physical activity score but in private the difference in night rotation and score were significant at 5 % level of significance. Thirty seven percent of nurses in government and 62 percent of nurses in private hospitals who had 10 years' experience had low scores in this regard. No statistical significant difference were found between scores and the years of experience ($p = 0.12$; $p = 0.51$).

From the table 6, the significant association was found between shift change and sleep score of respondents from private hospitals ($p < 0.01$). The average sleep scores mostly belong to the 4-6 category of having shift change in a month. There was no significant association between frequency of night shift rotation and sleep scores, this could be because of the representation of

respondents of both categories were not equal. Experience of nurses had significant association with sleep score of respondents of both government ($p < 0.05$) and private ($p < 0.05$) hospitals. Thirty percent of nurses in government who had 10 years of experience had good sleep score and 38 percent of nurses in private sector, who completed 10 years of experience had only average sleep score. From the sleep scores of both sectors, it was found that nurses in government hospitals had good sleep scores and in private hospital nurses had average sleep scores.

The study highlights that shift changes and work experience significantly influenced the sleep quality of nurses, with government hospital nurses reporting better sleep scores compared to those in private hospitals. The absence of a significant association between night shift rotations and sleep scores may be due to unequal representation across categories. Differences between government

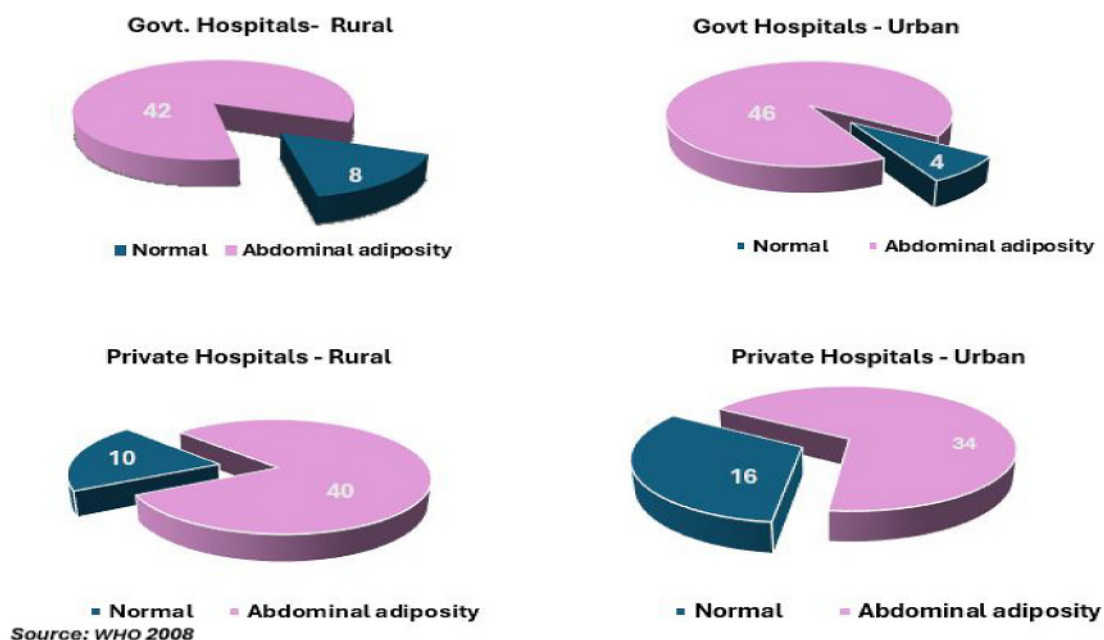


Fig. 2. Distribution of respondents according to WHR

and private sectors could reflect variations in workload, job stability and organizational support, with private hospital nurses experiencing higher stress and workload pressures that may impair sleep (Chung *et al.*,

2021). These findings emphasize the need for workplace interventions such as limiting frequent shift changes and promoting sleep

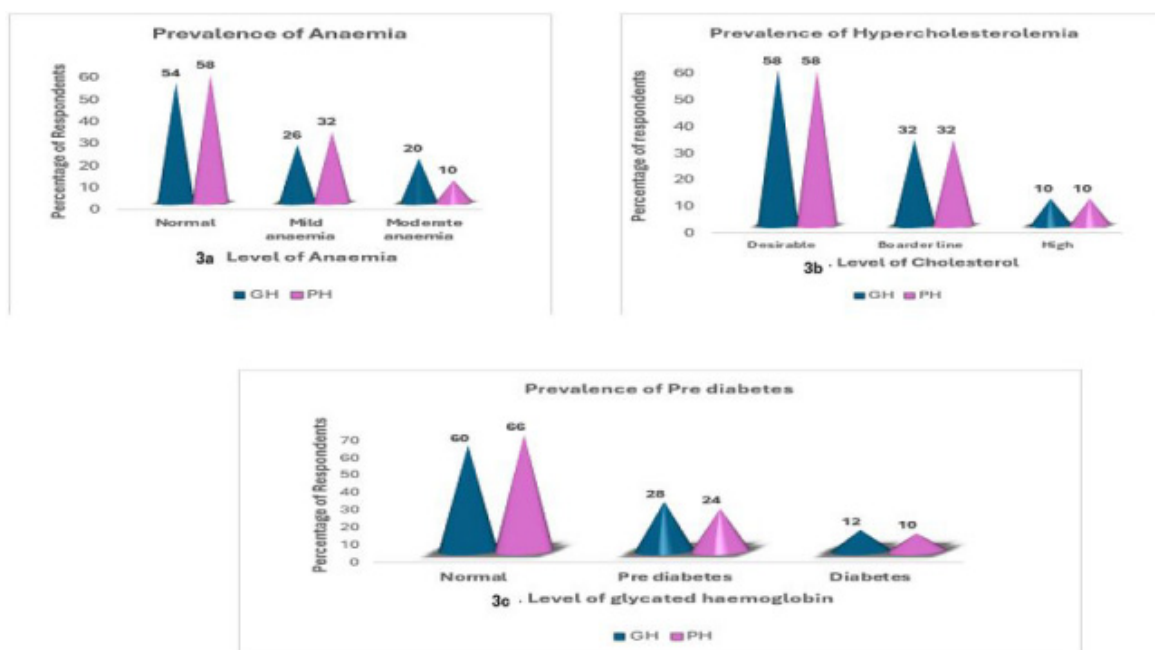


Fig. 3. Distribution of respondents based on biochemical parameters

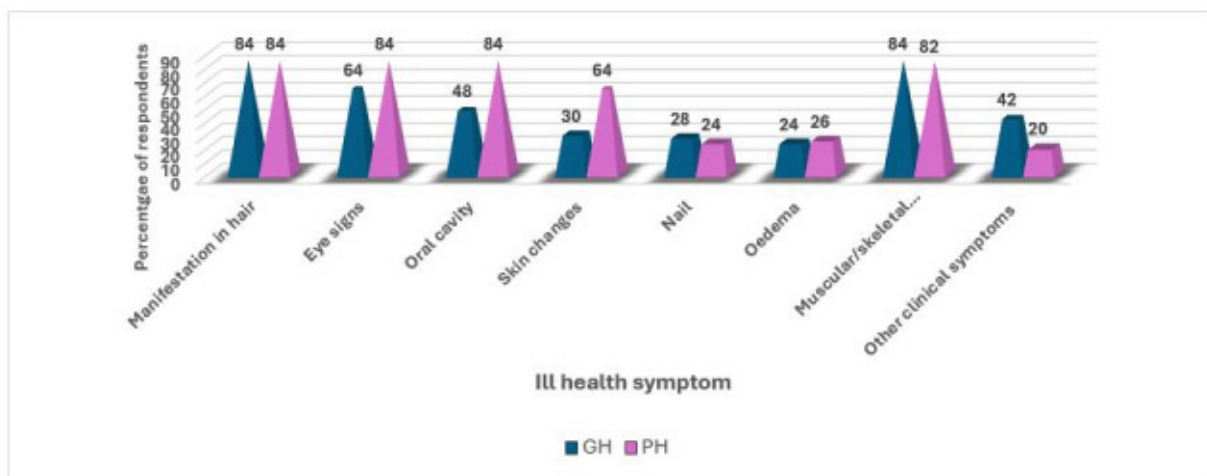


Fig.4. Distribution of respondents based on the clinical examination

hygiene to improve the well-being and performance of nurses (WHO, 2019).

Table 7 shows the significant association between quality of social and family relations with frequency of shift change among the respondents of government hospitals, moderately impaired relationship was seen in 62.8% of respondents who had more than 6 shift change per month in government

hospitals ($p < .01$). No significant association was observed among respondents from private hospitals ($p = .868$). Night shift rotation had significant association with quality of social and family relationships score among the respondents of private hospitals ($p \text{ value} < .05$). Fifty percent of nurses in private hospitals who took 2 night shift rotation had moderately impaired relations. But no

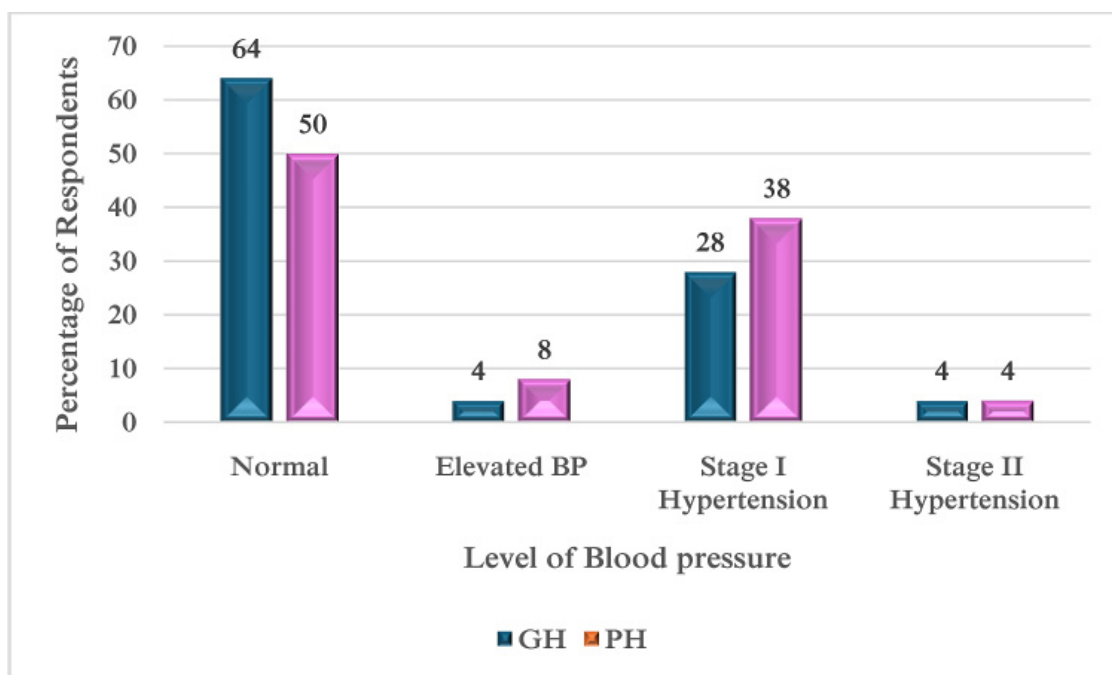


Fig. 5. Distribution of respondents based on blood pressure level

association was found in government hospitals ($p = .92$). No significant association is found between quality of social and family relations score and years of experience in government ($p = .438$) and private hospitals ($p = .38$). Based on family relation score, nurses from both government and private hospitals had moderately impaired relation scores.

The results indicate that frequent shift changes negatively affect social and family relationships among nurses in government hospitals, as shown by the higher proportion (62.8%) of respondents with moderately impaired relationships when exposed to more than six shift changes per month. This supports existing evidence that irregular shifts disrupt work life balance and contribute to social isolation and strained family interactions. In contrast, no such association was observed among private hospital nurses, possibly due to differences in organizational structures and coping mechanisms. However, night shift rotation significantly influenced the quality of social and family relationships among private

hospital nurses, with half of those working two-night shifts per rotation reporting moderate impairment. Years of experience did not show a significant relationship with family or social interactions in either group, suggesting that the impact of shift work on relationships may persist regardless of professional experience. Overall, these findings highlight the importance of organizational policies that minimize excessive shift changes and rotations to support nurses' social and family wellbeing (WHO, 2019).

The weight, height, waist and hip circumference of respondents were measured and tabulated for analysis. The BMI were calculated from the measurement of heights and weights of the respondents which is depicted below, based on BMI according to ICMR (2010).

Majority of respondents from both government (82%) and private hospitals (94%) were under weight. There were respondents with normal weight in government (16%) and

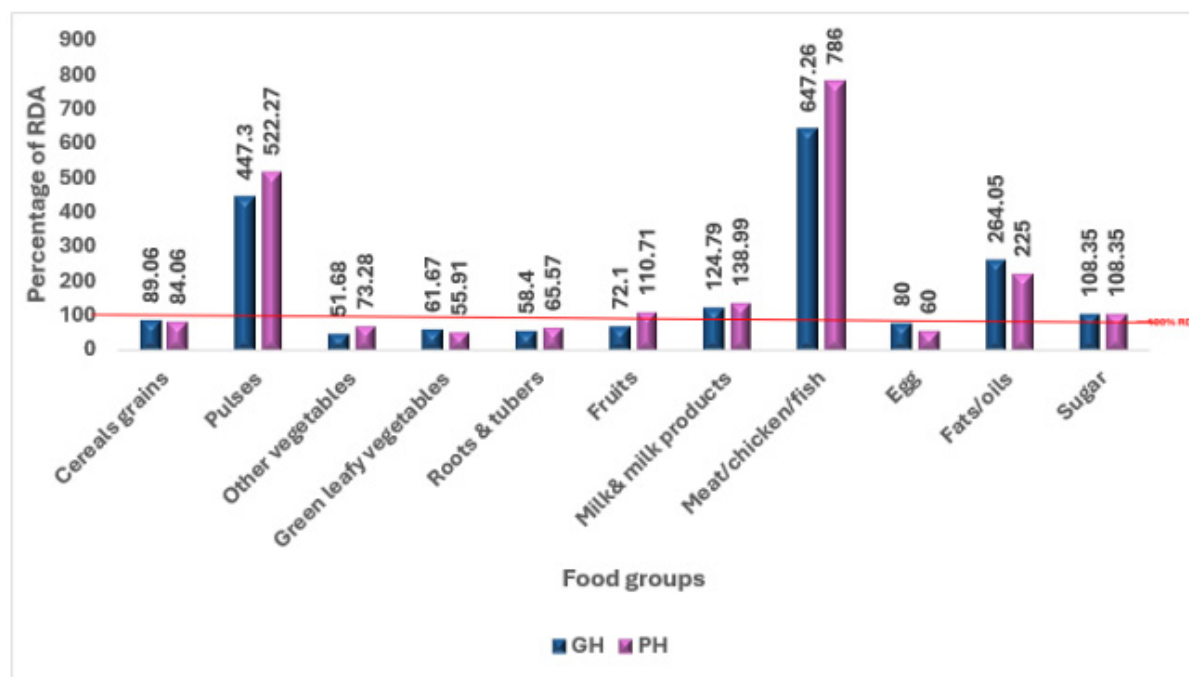


Fig.6. Percentage adequacy of food groups consumed compared to RDA

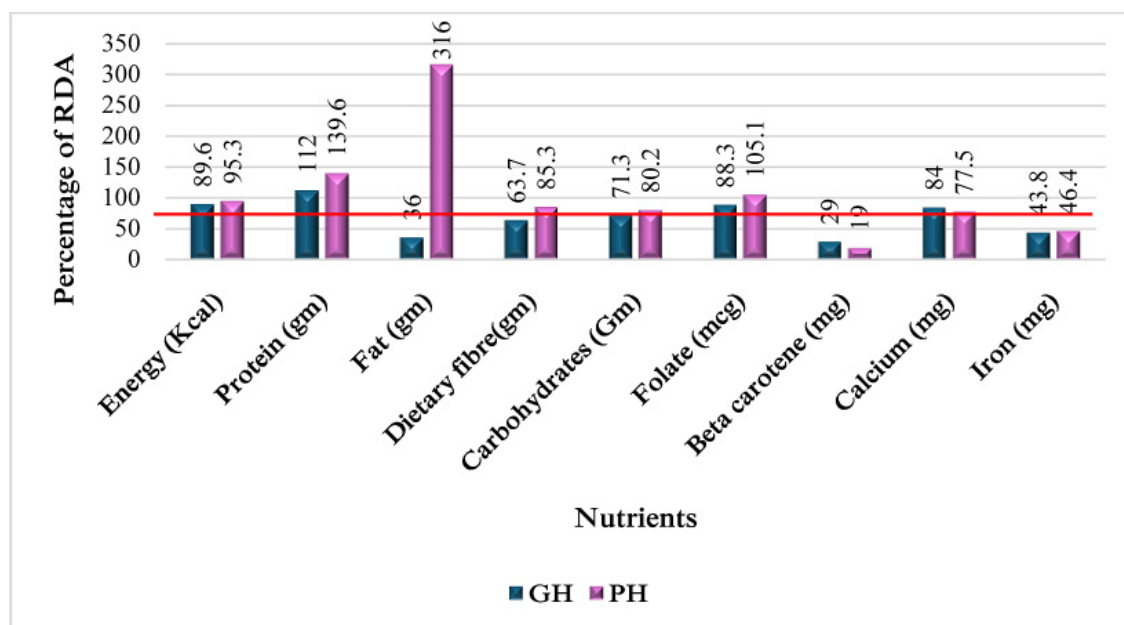


Fig. 7. Percentage adequacy of nutrients compared to RDA

private (6%) hospitals. Only two overweight respondents were found in government urban hospital. Statistically the association of BMI of respondents and hospital type was not found to be significant.

The majority of nurses in government hospitals (88%) and private hospitals (74%) exhibited abdominal obesity, as their waist-to-hip ratio was equal to or greater than 0.85. The proportion of nurses with a normal waist-to-hip ratio in both sectors is relatively low, with 12% in government hospitals and 26% in private hospitals. These findings highlight that a significant number of nurses showed signs of abdominal obesity, even among those classified as underweight.

The biochemical analysis revealed that approximately half of the nurses from both sectors were anemic, with severity ranging from mild to moderate, as depicted in Figure 3(a). Regarding cholesterol levels (Figure 3(b)), 42% of nurses across both sectors had levels classified as borderline to high. The HbA1C results, an indicator of diabetes, showed that nearly one-third of nurses in the

government sector and one-fourth in the private sector were in the prediabetic range. Additionally, nearly 10% of nurses in both sectors were found to have diabetes, as shown in Figure 3(c).

The high prevalence of anemia among nurses observed in this study is consistent with previous reports, where healthcare workers, particularly women, were found to have higher rates of anemia due to long working hours, irregular meals and nutritional inadequacies (Chaudhary *et al.*, 2021). Similarly, borderline to high cholesterol levels in nurses may be linked to occupational stress, sedentary work patterns, and shift-related dietary habits, which have been shown to increase the risk of dyslipidemia in health professionals (Sharma *et al.*, 2019). The proportion of nurses in the prediabetic and diabetic range aligns with earlier studies, which reported a higher prevalence of impaired glucose tolerance among shift workers due to circadian misalignment and disrupted metabolic regulation (Hulsege *et al.*, 2016). These findings highlight the dual burden faced by

nurses, where the demands of their profession contribute to both occupational stress and heightened metabolic risks.

Figure 4 illustrates the findings from the clinical examination, revealing that three-fourths of the nurses experienced hair-related issues such as hair loss, thinning, sparse hair and dandruff. Eye-related conditions, including dark circles, photophobia, pale conjunctiva and even night blindness, were also observed among the respondents. Additionally, disorders of the oral cavity, such as stomatitis, fluorosis, oral ulcers and bleeding gums, were more prominent among nurses across both sectors.

The blood pressure levels of nurses indicate that over one-third of the population is affected by high blood pressure, classified as Stage I and II hypertension. This is likely attributed to the stress and irregular schedules associated with their job. According to Chauhan and Sharma (2019), workplace stress significantly contributes to health issues such as hypertension among nurses. In the present study, a notable proportion of nurses in government (64%) and private (50%) hospitals had normal blood pressure. However, 4% of respondents in government hospitals and 8% in private hospitals had elevated blood pressure levels. About 42% of nurses working in private hospitals and 32% in government hospitals were found to be hypertensive. These findings suggest that hypertension is prevalent in nurses from the early stages of their careers, primarily due to job-related stress and unhealthy time schedules, as supported by the literature on the subject.

Several studies have similarly reported a high prevalence of hypertension among nurses, emphasizing the role of occupational stress and irregular schedules (Chauhan and Sharma, 2019). These findings further validate the present study, highlighting that

hypertension often develops early in nurses' careers due to the demanding nature of their work.

Figure 6 highlights the food items consumed below 100% of the Recommended Dietary Allowance (RDA). The RDA compared here is for sedentary female worker, as per the National Institute of Nutrition classification given (Gopalan *et.al*, 2021). These include cereals and grains, pulses, other vegetables, green leafy vegetables, roots and tubers, fruits, milk & milk products, meat/chicken/fish, eggs, fats/oils, as well sugar.

The list of food items consumed in quantities exceeding the 100% Recommended Dietary Allowance (RDA), including fats/oils, milk and milk products, meat/chicken/fish, fruits, pulses, and sugar. This indicates a significant deficit in the intake of foods from all major food groups. Nutritional intake was assessed using the 24 hour recall method and the results are showed in Figure 7.

The data revealed a significant nutrient deficiency in the diet of nurses in both sectors, as shown in Figure 7. Their intake of several key nutrients, including calories, fibre, carbohydrates, folate, beta-carotene, calcium and iron, falls below the Recommended Dietary Allowances (RDA). Interestingly, both groups exceeded the RDA for fat, which could contribute to dyslipidaemia. The inadequate intake of iron and folate likely explains the high prevalence of anaemia, a widespread concern in India, where 53% of women are reported to suffer from anaemia, as per the National Family Health Survey (NFHS-5, 2019-2021), a similar finding to the NFHS-4 that reported 53% of women affected by anaemia (NFHS-5, 2019-2021). This issue is also highlighted in the Ministry of Health and Family Welfare's National Health Policy (2017).

Furthermore, the insufficient calcium intake could lead to osteoporosis later in life.

The study found that calorie intake was insufficient in both sectors, primarily due to low carbohydrate consumption. However, fat intake was notably high, constituting 276-300% of the RDA. A common eating habit among this population is skipping breakfast and consuming fried snacks, which are the primary options available at hospital canteens. These findings align with a recent study by Yulyani and Safitri (2022), which reported a similar trend of low calorie and carbohydrate intake among adolescents, though fat intake was high. The study also observed poor nutritional knowledge among participants, which may exacerbate these dietary issues. Highlighting this trend, the NFHS-5 (2019-2021) further reports that 63% of Indian women have an inadequate intake of calcium, which could have implications for bone health in the long term. Similarly, 35% of women and 19% of men are found to have insufficient dietary iron intake, reinforcing the data from the study and raising concerns about iron deficiency anaemia.

By addressing these nutritional gaps, particularly the high fat intake and deficiencies in key micronutrients, targeted interventions can help improve the health outcomes for nurses in both sectors.

CONCLUSION

The study highlighted critical health and lifestyle concerns among nurses in Thiruvananthapuram. A large proportion of respondents reported insufficient physical activity, with 72% of government and 78% of private hospital nurses not engaging in regular exercise; among those who did, walking (17% in government and 13% in private hospitals) was the most common form. Sleep deprivation was prevalent, as 51% of nurses in government hospitals and 56% in private hospitals reported inadequate sleep, with 6.8% and 10%, respectively, having irregular sleep patterns. Social and family relationships were also

affected, with 46% of government nurses and 16.8% of private nurses reporting deterioration in their interactions.

Nutritional analysis showed that 41% of government and 47% of private hospital nurses were underweight, while dietary practices revealed poor habits - 40% in government and 70% in private hospitals skipped meals regularly. Biochemical analysis indicated a high prevalence of health issues: 50% of nurses were anemic, 42% had borderline to high cholesterol, and 33% in government and 25% in private hospitals were in the prediabetic range, with nearly 10% diagnosed with diabetes. Blood pressure analysis revealed that 32% of government and 42% of private nurses were hypertensive, highlighting the burden of cardiovascular risk.

These quantitative findings underscore the urgent need for targeted workplace interventions focusing on structured physical activity programs, improved sleep hygiene, stress reduction strategies and nutrition education to address anemia, metabolic risks, and lifestyle-related disorders, thereby enhancing the overall health and productivity of nurses.

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