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Health status of nurses in Kerala: A cross sectional study

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Abstract
Background: The nursing population is very vulnerable to problems related to physical and mental health, occupation, nutrition. Most of the times nurses work in challenging work environments, where they have to deal with a great amount of stress both professionally and personally. The objective of this study is to assess the stress level and various hazards nurses faced in their daily work life and also to ascertain the health status of these professionals.
Methods: This is a cross sectional, comparative study, using purposive sampling technique. The sample consisted of registered female nurses (N=500) aged 25-45years working in government and private hospitals selected from rural and urban areas of Thiruvananthapuram city. Nursing stress scale were used to assess the level of stress. The various occupational hazards exposed by the respondents were studied. Reproductive health profile of nurses were also studied. Anthropometry, biochemical, dietary and clinical assessment methods were used to elicit their nutritional status. Two major criteria for the selection of sample were 1) minimum of 5 years of experience 2) nurses working on shift bases.
Results: Stress of nurses were observed to be moderate to high, in both sectors. They were also exposed to various occupational hazards. PCOD and fibroid were the most reported reproductive health problems among them. The nurses had poor dietary practices along with high prevalence of underweight and abdominal obesity. Biochemical analysis of blood samples indicated the prevalence of anemia, diabetes, hypercholesterolemia and hypertension.
Conclusion: This study has identified there is a large lacuna in the health profile of nurses. There is an urgent need by hospital managements and policy makers to ensure quality nursing service through staff development and training programs. A more congenial work environment will be more cost-effective in the long term.

Keywords: Female nurses, health status, stress, occupational hazards

Introduction
Patient safety is important, but at the same time, the safety of nurses who take care of patients is also crucial. Workplace safety is must for nurses. But in our Indian hospital there is no assurance about the safeties they get. Nurses are exposed to various hazards such as biological, physical and chemicals. Izadi and Piruznia (2017) [2] concluded that, the nurses have potential exposure to many occupational hazards which put them at risk of different injuries and disorders. The researchers from the University of Southampton in UK, found that, women who worked in different shifts had an increased risk of menstrual disruptions, subfertility and miscarriages (Condon, 2013) [3]. Shift work negatively impacted on health and nutritional status of workforces (Amani and Gill, 2013) [1] found that.
The nursing population is very vulnerable to problems related to physical and mental health, occupation, nutrition. The dual burden of workplace and home are seen to affect their family and life style. Most of the times nurses work in challenging work environments, where they have to deal with a great amount of stress both professionally and personally.

Objective
- To assess the stress level of these professionals
- To identify the various hazards nurses faced in their daily work life
- To assess the health profile of the subjects with reference to the anthropometric measurements, biochemical studies, clinical-dietary investigations and also the reproductive profile of nurses

Working Hypothesis

Nursing is a highly demanding profession. In their daily life they are facing occupational stress and various hazards from their working environment which adversely influence their dietary practice and nutritional status.

Methodology

Study design and sample

The study was designed as a cross sectional comparative study using purposive sampling technique. The sample population consisted of registered nurses working in government and private hospitals of Thiruvananthapuram city, Kerala. Uniform sample size of 250 respondents were drawn from government and private hospitals of Thiruvananthapuram district to form a population size of 500. Only female nurses who had a minimum of five years of experience and those who belonged to the age group between 25-45yrs were included in the study. All the respondents selected for the study were working on shift from the day of joining their duty, which was also a criteria for selection. Information regarding demographic characteristics and other personal details were collected by face to face interview by the investigator using a pretested schedule. Ethical clearance from the Ethics committee was obtained (Approval no:11/IEC/GTKA). Written informed consent was obtained from the respondents prior to the start of the interview.

Assessment tools

The level of occupational stress of the respondents were assessed with the help of the Nursing Stress Scale (NSS) which is an adapted version developed by Gray-Toft and Anderson (1981). This helps to understand the level of occupational stress with in a variety of work settings. The investigator identified the different physical, chemical and biological risks at the various units that the nurses were expose. The nature of these risks were also recorded in the developed schedule. Details regarding the menstrual history of respondents such as regularity of menstrual periods, duration and interval of menstruation cycles, dysmenorrhoea, nature of discomfort and medication during menstruation time were collected with the help of a pretested schedule. The nutrient intake information were obtained by recording 24 hour dietary recall method. Anthropometric measurements were taken for the assessment of nutritional status. Height, weight and waist- hip circumference were measured using standardised techniques.

Statistical analysis

Descriptive and inferential statistical methods were used for analysing the variables. Compounded NSS-S and NSS-F scores of respondents were calculated to understand the severity and frequency of stress they experienced. Using the mean scores, the nurses in both sectors were divided in to 3 groups: mild (less than mean- S.D), moderate (mean-SD to mean+ S.D) and severe (greater than mean+ S.D). The association of different NSS scores with number of shift changes /month was statistically analysed using Pearson chi square test. Percentile analysis were used for assessing the data regarding nutritional assessment, reproductive health profile and various hazards.

Findings and Discussion

Majority of the respondents of government hospitals (35%) belonged to the age group 40-45 years while in private sector, majority of the respondents (50%) belonged to the age group 30-35 years. Majority of the respondents in government hospital (83.2%) and private hospitals (88%) were married. Thirty three percentage of respondents in government hospitals had an experience below 5 years while in private hospitals, majority of the respondents (62%) had 5 to 10 years of experience. Majority of the respondents of government hospitals (33%) belonged to the salary package between Rs 30001-40000/- while in private sector, majority of the respondents (79%) belonged to the salary package between Rs 20001-30000/-.

Association of stress scores and number of shift change per month were checked. In government hospitals, the NSS-S score and frequency of shift change showed no significant association (p=0.63).But in private hospitals, there was significant association (p=<0.01) between NSS-S score and number of shift change per month. The nurses who took more than 6 shift changes in a month were more affected.

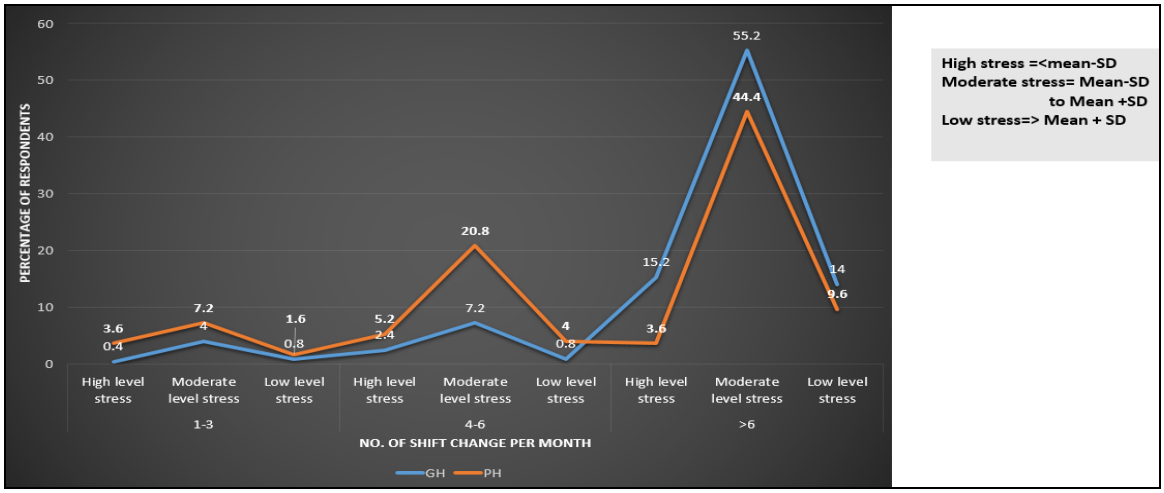

Fig 1: Association of NSS-S and number of shift change per month

The figure 1 indicates that there was significance association between NSS-F and number of shift change per month in government *(p=<0.05)* and private *(p=<0.01)*. The table indicates that the frequency of stress is more among nurses who took more than 6 shift changes in a month. Length of time the nurses spent in work place is also a cause along with daily rotation shift.

When the government and private hospitals were compared based on scores, the stress frequency was more among private hospitals (20%) than government hospitals (9%).

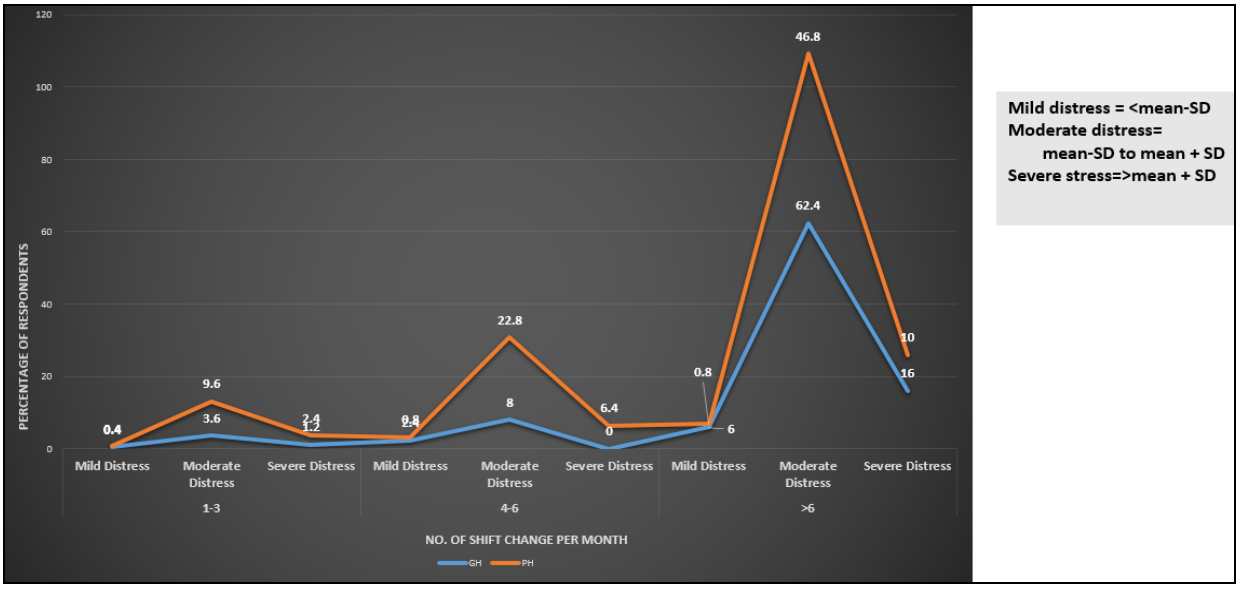

Fig 2: Association of NSS-F and number of shift change per month

Working environment and nature of duties expose nurses to face numerous occupational hazards. Such hazards are divided into physical, chemical and biological hazards. The details of hazards faced by the respondents are discussed below.

The majority of nurses from government (39.6%) and private (70.8%) suffered from strenuous static posture. As a part of their duty, postures like prolonged standing, sitting and stooping positions are common in nurse's daily job, which found physically strenuous for them. Most of the nurses in the government (28.8%) and private (43.2%) hospitals encountered needle stick injuries which is a common problem faced by nurses especially during their initial stages of work. These hazards were followed by muscle tear, few of the nurses suffered from back injuries due to falls in government (2.8%) and private hospitals (19.2%).

With respect to biological hazards, majority of nurses in government (44%) and private (52.8%) hospitals got infections from the patients in hospitals. In government hospitals, the above hazard was incurred by handling contaminated needle/surgical instruments (37.2%), which was followed by blood borne diseases (31.6%), vector borne diseases (12%), direct contact with contaminated specimen (8%) and cuts/ lacerations (6%). In private hospitals the second major biological hazard faced was direct contact with contaminated specimens (34.8%), followed by the handling of contaminated surgical instruments (26%), blood borne pathogen diseases (17.6%), cuts or lacerations (13.2%) and vector borne diseases (10%). As nurses come in direct contact with patients, there is greater risk of the above problems, and they are thus exposed to many communicable diseases.

In government hospitals, majority of nurses (34.4%) handled formaldehyde. Formaldehyde is used in hospitals as a disinfectant and as a fixative and preservative of anatomical specimens. When it contact with mucous membranes (eyes, nose and throat) can cause irritation, and many exposed individuals also develop allergic sensitizations resulting in dermatitis and rashes (Sheriff, 2018).

Formaldehyde was followed by sterilants (30%), glutaraldehyde is the commonly used sterilant in hospitals and exposure to it causes irritation to eye, skin and respiration; 13.6 percent of nurses reported that they were exposed to anaesthetic gases which was likely from labour rooms, operating rooms and recovering rooms. This was followed by latex allergy (6%), antineoplastic drugs (4%), and carbonic solution (2%).Among nurses in private hospitals, majority of nurses (38%) reported that, they were exposed to sterilants which was followed by formaldehyde (24.8%), phenol (14.8%), latex allergy (12%), anaesthetic gases (7.6%), antineoplastic drugs (2.4%) carbonic solution (0.8%) and hypochorlates (0.4%). Phenols and hypochlorates were used as disinfectants. Carbonic lotion were used for skin treatment.

Majority of nurses in government (74%) and private (84.8%) hospitals had regular periods, while sixteen percent of nurses in government and fifteen percent of nurses in private were having irregular periods. Majority of respondents in government (76%) and private (89%) hospitals had the bleeding duration between 1-5days which is normal. Eighty two percent in government and 84 percent in private hospitals nurses had normal bleeding. Fourteen percent of nurses in government and 17 percent of nurses in private hospitals had dysmenorrhoea. Majority of respondents in government (15%) and private (12%) hospitals were taking medicines for relief from pain during menstruation.

The various reproductive health problems faced by the respondents were viewed. Reproductive health problems were categorised into 5 main problems- Fertility, hysterectomy (surgical removal of uterus), Cancer (breast and ovarian cancers), menstrual problems (irregular periods, early menopause, bleeding problems) and other gynec problems (fibroids, ovarian cyst, PCOD). in government (19%) and private (15%) hospitals faced gynec problems like fibroid and PCOD. This was followed menstrual problems, where in 12 percent nurses in government and 7 percent nurses in private hospitals faced this problem. These health problems were followed by fertility problem among 6% percent of respondents in government and 8 percent of respondents in private hospitals. Two percent of respondents in government and 1 percent nurses of private hospitals underwent hysterectomy, ie the surgical removal of complete uterus due to the various problems such as heavy bleeding, uterine prolapse, fibroids which caused severe pain etc. One percent of respondents of private hospitals reported to have cancer.

Anthropometric profile of the nurses indicated that underweight was wide spread in both sectors. Only small proportion of them were normal and two percent were found over weight in government sector. Details are shown in figure 3.

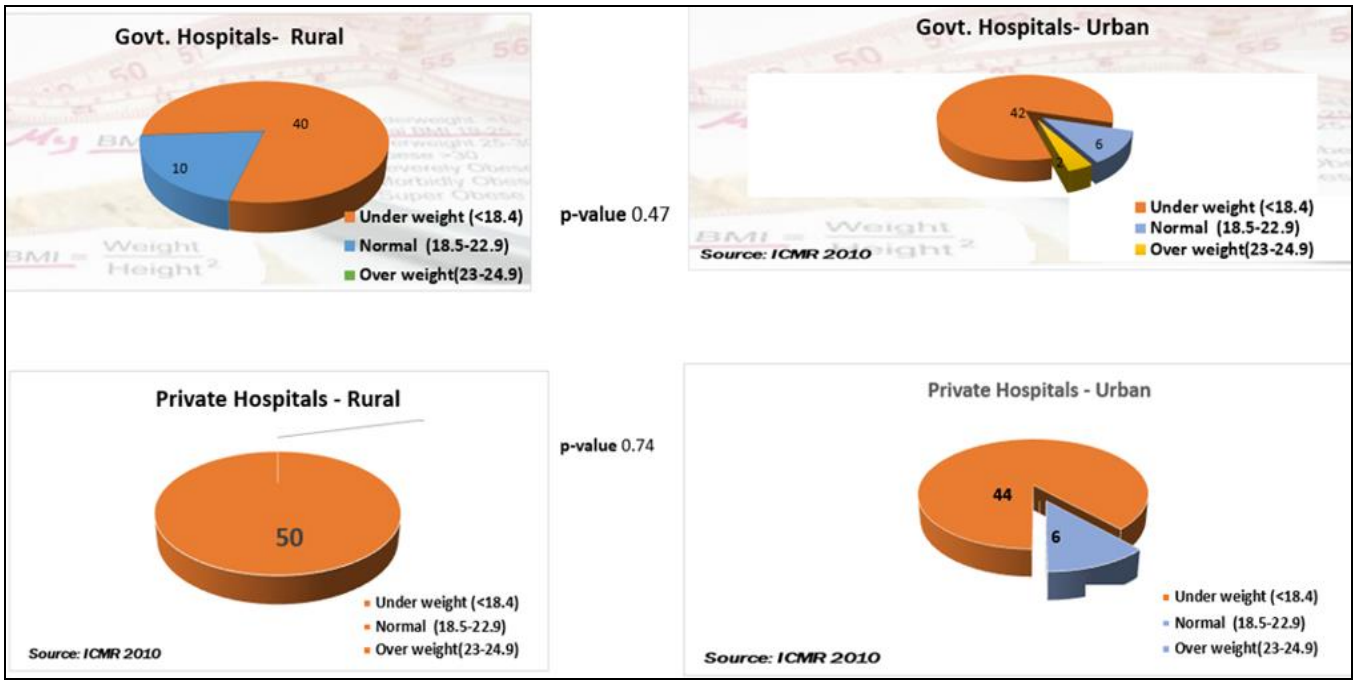

Fig 3: Distribution of respondents according to Body Mass Index (BMI)

Data of waist-hip ratio showed that majority of them exhibited abdominal obesity in spite of the underweight (Figure 4).

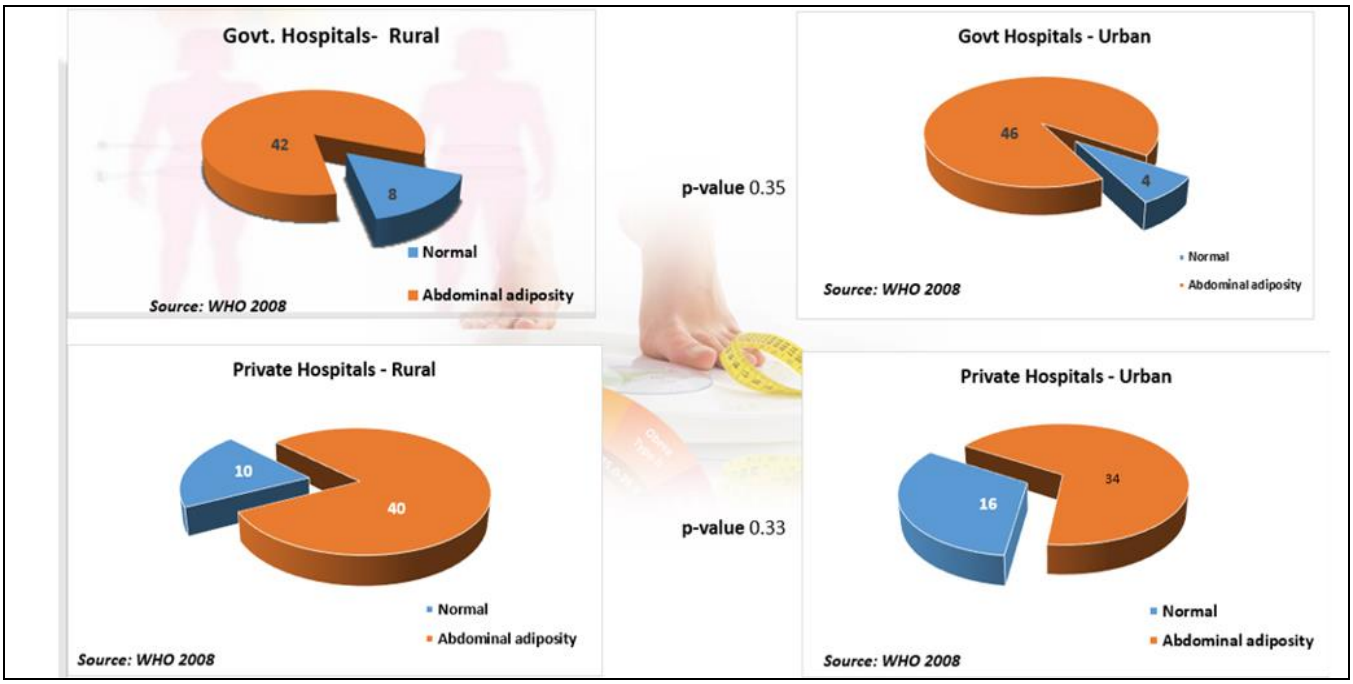

Fig 4: Distribution of respondents according to waist hip ratio (WHR)

The biochemical parameters shows that nearly half of nurses from both sectors had anaemia ranging from mild to moderate. With regard to cholesterol, 42 percent of nurses in both sectors have boarder line to high cholesterol level. The HbA1C, which is an indicator of diabetes. Nearly one-third of the nurse in government and one-fourth of nurses in private sector exhibited pre diabetes. Nearly 10% of nurses had diabetes in both sectors.

Clinical examination done by a medical profession. More than three- fourth of them have hair problems like dandruff, hair loss and thin sparse hair. Eye signs and oral cavity disorders are more evident in the nurses in private hospitals.

Regarding the measurement of blood pressure of nurses from both sectors, about one-third of nurses had high blood pressure which is classified as stage I hypertension. It found that it was associated with night shift rotation.

The below graph shows the percentage distribution of RDA with respect to the nutrient intake of nurses in both government and private sectors. The figure 10 revealed that, there is a gross deficit of macro and micro nutrients in the diet of nurses in both sectors. It was found that the intake of calories, fibre, carbohydrates, folate, beta carotene, calcium and iron was less than RDA in both sectors. Intake of fat in both the group was higher than the RDA, this would explain their dyslipidaemia. The low intake of iron and folate is responsible for the anaemic condition among them.

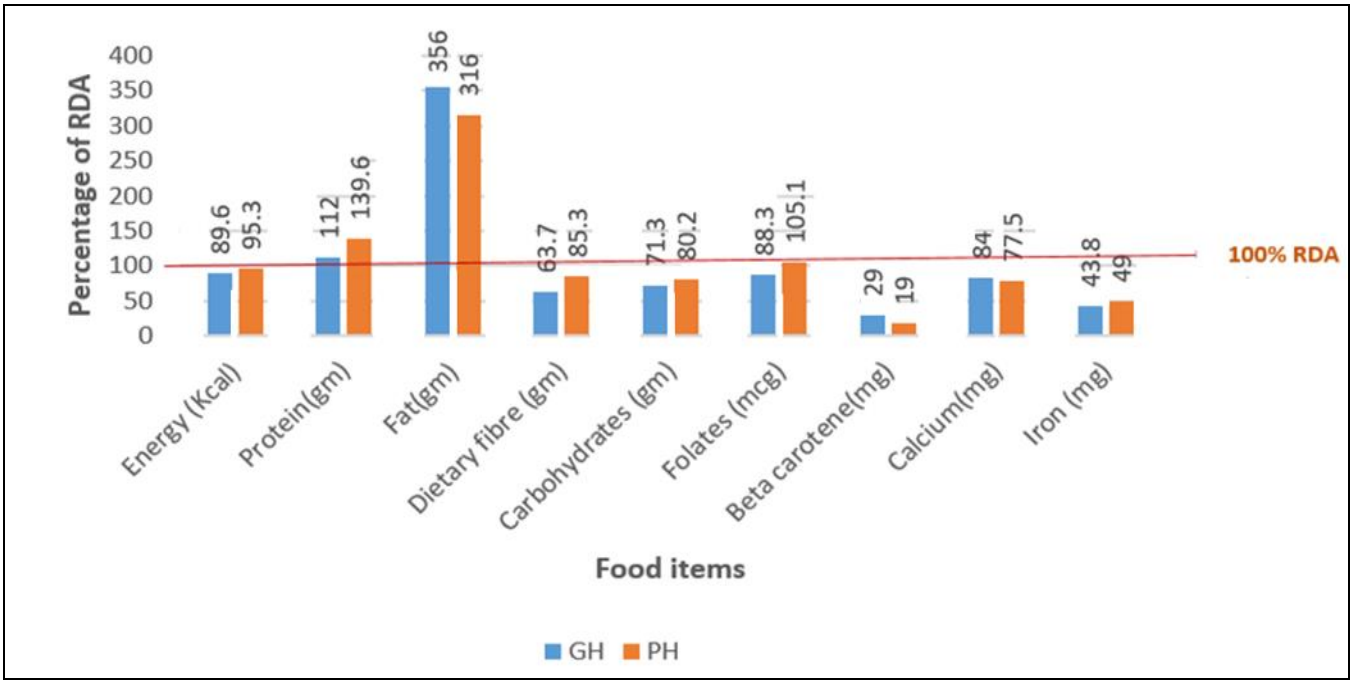

Fig 5: Percentage distribution of RDA with respect to the nutrient intake

It was interesting to note that the intake of total calories was inadequate in both the sectors. The inadequate calorie intake can be explained by the low intake of carbohydrates. However, this population had a very high intake of fat (more than 276-300% of RDA). Most of the nurses ate fried snacks as this was the only available item in the hospital canteens. This eating habit of skipping breakfast and munching on fried snacks is very popular amongst this population. Similar findings were observed among the adolescent girls in the study conducted by Gopinathan *et.al* (2018), which reported that their energy intake was below RDA, where the level of fat and protein intake found higher than the RDA.

Summary and Conclusion

The present study contributed to highlight the stress in work place, dietary intake, reproductive health and other problems encountered by nurses working on shift in hospitals. The results revealed, health problems and hazards in work places, which in turn affected their overall health. The current study indicated that nurses had poor dietary practices and deficits in their nutrient intake along with high prevalence of underweight and abdominal obesity. Biochemical analysis of blood samples indicated the prevalence of anemia, diabetes hypercholesterolemia along with high blood pressure and clinical deficiencies amongst younger nurses.

This study has identified there is a large lacuna in the health profile of nurses. There is an urgent need by hospital managements and policy makers to ensure quality nursing service through staff development and training programs. A more congenial work environment will be more cost-effective in the long term.

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