

Nutritional Status Screening of Doctors and Nurses of Selected Hospitals in Bengaluru

Aparna Nagendra^{1*}, Namratha Pramod², Sowmya Rao³, Premila C⁴ and Suneetha Rao⁴

¹Department of Nutrition and Dietetics, Bhagwan Mahaveer Jain Hospital, Girinagar, Bengaluru, India

²Department of Nutrition, Sports Authority of India, Bengaluru, India

³Manipal Academy of Higher Education, Dubai, UAE

⁴Department of Nutrition and Dietetics, NU-Hospitals, Bengaluru, India

***Corresponding Author:** Aparna Nagendra, Senior Dietician, Department of Nutrition and Dietetics, Bhagwan Mahaveer Jain Hospital, Girinagar, Bengaluru, India.

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Abstract

Food and physical activity mainly influences the nutritional status of the people. Taking improper amount of food results in malnutrition (i.e., overweight, obesity or under nutrition) which ultimately affects physical well-being of the people. Nutritional status of people is also closely linked with dietary fat intake. A medical doctor is one who is qualified to examine, diagnose and treat patients while nurses are supportive services which is a physically demanding profession, and both the professions have considerable mental stress at work which can influence the nutritional status and dietary habits. The practice of medicine in the modern era is beset with unprecedented challenges in virtually all cultures and societies. These challenges among doctors center on increasing imbalance between the legitimate needs of patients, the available resources to meet those needs, the increasing dependence on market forces to transform health care systems and the temptation for physicians to forsake their traditional commitment to the primacy of patient's. Similarly among nurses the shift timings involved in patient care also has a negative impact on the dietary pattern. Worksite wellness programs benefit from developing tailored interventions that consider employees' health-related knowledge and self-efficacy to change behavior. Therefore, aim of our study was to focus on the assessment of nutritional status and food intake of doctors and nurses working at different hospitals in Bengaluru.

Keywords: Dietary Intake; Micro and Macro Nutrients; 24 Hour Dietary Recall; RDA-Recommended Dietary Allowances; Physical Activity

Introduction

Throughout a lifespan, improper nutrition is associated with several chronic diseases which has great impact on morbidity, mortality and quality of life. Nutritional status of the people in a country is mainly influenced by the food they consume regularly [1]. Adequate nutrition is essential to a healthy life and healthy aging of an individual as well as on a societal level. However, there is moderate awareness about this issue worldwide and people must overcome the hurdle from awareness to action [2].

In many developing countries, the progression of nutritional transition has been detected, which is characterized by a reduction in the prevalence of nutritional deficiencies and the more expressive occurrence of overweight and obesity [1]. Nutrition transition over the past 40 years has resulted in about 7% decrease in energy derived from carbohydrates and 6% increase in energy derived from fats. The dynamic shift from traditional diets rich in grains,

fruits and vegetables to the modern diets which are rich in fat, sugar and salt has coupled with reduced physical activity which is mainly due to rapid urbanization [3]. Technological advancements have simplified the work and life of many health care professionals leading to reduction in their physical activity [4] by escalating the levels of obesity and thereby causing atherogenic dyslipidemia, metabolic syndrome, type 2 diabetes mellitus and CHD (coronary heart disease) [3].

Currently the medical profession is confronted by an explosion of technology, changing market forces and problems in health care delivery. Where, physicians find it increasingly tough to meet their responsibilities to patients and society [5]. Due to doctors busy work schedule and problems in health care delivery cause them to neglect their own health by devoting their time for the wellbeing of others. In the same way the nurses also play an important role in the medical community. The expertise of nurses in their profession

gives physical and emotional support to the patients and help in speedy recovery. Nursing is a round-the-clock profession and most nurse's work on weekends, during holidays, and perform variable shifts. They also report to have lack of time to prepare healthy meals due to long working hours and being overtired from work [6,7]. Various studies have showed that while performing their role, nurses face multiple occupational and personal stressors that may have an influence on their ability to perform regular exercise and maintain positive dietary habits [8].

Diet plays a major role for a wide range of life style-related chronic diseases. Contrary to other lifestyle risk factors like alcohol and smoking, dietary exposures are difficult to measure because all individuals consume food and though the amount and the kind of food consumed varies between subjects, they rarely perceive what and how much they eat [9]. The practice of medicine in the modern era is a hardship with unprecedented challenges in virtually all cultures and societies. Especially around a busy work schedule and growing health crisis, more attention needs to be given to eating healthy and staying active. Since 60% of our waking hours is spent at work, it stands to reason that the workplace is a good place to encourage healthy eating. Therefore, the scope of our study was to focus on the assessment of nutritional status and dietary intake of doctors and nurses working in different hospitals. To improve the awareness of nutritional status, life style factors that affect health and nutritional diagnosis to avoid risk of further chronic diseases.

Methodology

Study design

- **Sample Selection:** Study was carried out in two different hospitals of Bengaluru. 30 doctors (15 male, 15 female) and 30 nurses (female) were included based on their willingness to participate in the study. The participants were between the age group of 20-60 years located in Bengaluru. Somatic status, dietary pattern and physical activity were assessed. A detailed questionnaire was used, adopting the direct personal interview method. Approval was obtained from the management, before initiating the study and consent was taken from the participants.
- **Somatic Status:** Anthropometric Measurements - Height (cm), Weight (kg), Waist Circumference (cm), Hip Circumference (HC) (cm) Mid Upper Arm Circumference (MUAC) and Triceps Skinfold Thickness (TSF) was measured using standardized techniques for all the subjects. Height was measured using a stature meter (No 26SM model), which has a precision of up to 0.1 cm. The stature meter was suspended 2m high from the floor against a straight wall. The individual was asked to stand upright without shoes with his/her back against the vertical wall, heels together and

eyes directed forward. Height measurement as appeared in the read off area was then recorded. Weight was recorded with minimum clothing and without shoes using an adult weighing scale. A standard non elastic tape was used to measure the waist and hip circumferences and measured to the nearest 0.1cm. WC was taken horizontally at the midpoint between the lower margin of the last rib cage and the top of the iliac crest. HC was measured around the widest portion of the buttocks, using a measuring tape parallel to the floor [10]. Body mass index (BMI) was calculated using the formula (weight in kg)/(height in m²). Weight status was then classified in accordance to cut off values for BMI recommended by World Health Organization (WHO) for Asia Pacific Standard classification (2009) [11]. Waist-Hip-Ratio (WHR) was calculated as WC divided by HC [10]. MUAC was measured at the midpoint between the acromion and the olecranon using a non- stretchable measuring tape. TSF was measured using a skinfold calipers at the triceps region [12].

- **Personal History:** A preformed questionnaire was used to record the background information. Dietary intake of all the participants was collected by interviewing them in detail regarding- type of food consumed, regular meal timings, number of meals per day, skipping of meals, food consumption frequency and frequency consumption of junk foods, processed food, ready to eat food, sugar and salt were taken. With the help of household measures relevant to Indian cuisine models they were asked to quantify the portion size of the food that they consumed to construct the individuals 24 - hour dietary intake. Raw amounts for the cooked food items were derived by standardizing the preparatory methods of different menu items. The nutrient intake was then derived by the amount of food items included in the diet using the software.
- **Interpretation and Analysis of the data:** Keeping the objectives in mind, the data collected was compiled tabulated for the appropriateness of analysis. Diet soft software was used for the 24 hour dietary recall analysis. The nutrient intake of the subjects was computed against Recommended Dietary Allowances (RDA) for ensuring the appropriateness of intake derived based on Indian Council of Medical Research (ICMR, 2010) for age, gender and activity [13]. The data was then statistically analyzed using appropriate statistical tests of significance and results were then interpreted; appropriate conclusions were drawn.

Results and Discussion

Background information of the participants (Table 1) showed that the age distribution was highly skewed with 35% and 28% falling in the age group of 25 - 34 and 35 - 44 years respectively. There was an appraisal of marital status, with 58% married. An attempt was made to include equal number of doctors (15 male and

15 female) and nurses (30 female) in each group. Among the total participants 28% and 27% were post graduates and specialists respectively. Majority 40% of the study group had an income range of 2 - 3 lakh per month while about 27% had a spike of up to >5 lakh per annum. 12% of the participants were hypertensive and 7% were diabetic (Figure 1). 60% of the doctors and 74% nurses had a sedentary lifestyle being in the medical profession (Figure 2).

Characteristics	Male (n = 15) No (%)	Female (n = 45) No (%)	Total (n = 60) No (%)
Age (yrs.)			
25 - 34	5 (33)	22 (49)	27 (45)
35 - 44	5 (33)	12 (27)	17 (28)
45 - 54	1 (7)	9 (20)	10 (17)
≥55	4 (27)	2 (4)	6 (10)
Marital Status			
Married	8 (53)	27 (60)	35 (58)
Single	6 (40)	17 (38)	23 (39)
Divorced	1 (7)	1 (2)	2 (3)
Widow	-	-	-
Education			
Graduate	1 (7)	26 (58)	27 (45)
Postgraduate	6 (40)	11 (24)	17 (28)
Specialist	8 (53)	8 (18)	16 (27)
Occupation			
Duty doctor	6 (46)	8 (18)	14 (23)
Specialist	8 (46)	1 (2)	9 (15)
Anesthetist	-	5 (11)	5 (8)
Microbiologist	1 (8)	1 (2)	2 (3)
Senior nurse	-	3 (7)	3 (5)
Staff nurse	-	27 (60)	27 (45)
Family Income (Per annum)			
<1 Lakh	1 (7)	2 (4)	3 (5)
1 - 2 Lakh	2 (13)	5 (12)	7 (12)
2 - 3 Lakh	2 (13)	22 (48)	24 (40)
3 - 4 Lakh	6 (40)	4 (9)	10 (16)
>5 Lakh	4 (27)	12 (27)	16 (27)

Table 1: Background Information of the Participants.

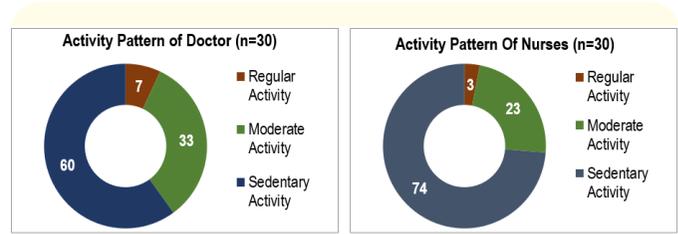


Figure 2: Activity Pattern of the Participants.

From figure 3, it was observed that as a part of their daily physical activity, the doctors followed regular exercise (60%) where 57% preferred walking, but on another hand 83% nurses never followed any activity regime except a few of them (7%). It was also found that 10% of the doctors performed pranayama for relaxation. A good sleep pattern of 6 - 7 hrs, (37% and 70% respectively) was observed among both doctors and nurses, but 7% still had a disturbed sleep of 5 - 6 hrs. Due to their hectic work schedule and patient care, it was noted that doctors (33%) and nurses (20%) skipped their meals and followed an irregular timing. 77% nurses followed a 3 meal pattern while doctors (46%) had a 4 meal pattern. Majority 60% doctors and 57% nurses were vegetarians (Figure 4).

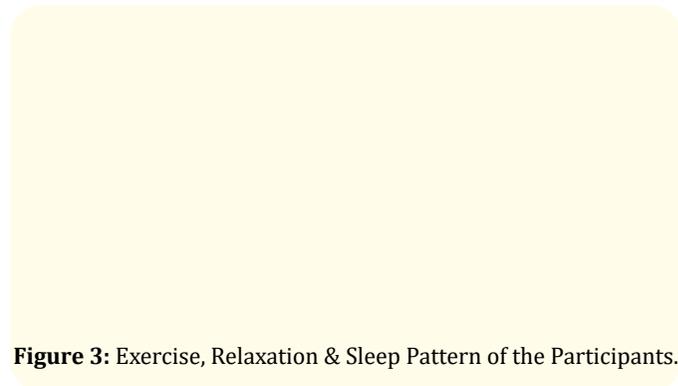


Figure 3: Exercise, Relaxation & Sleep Pattern of the Participants.

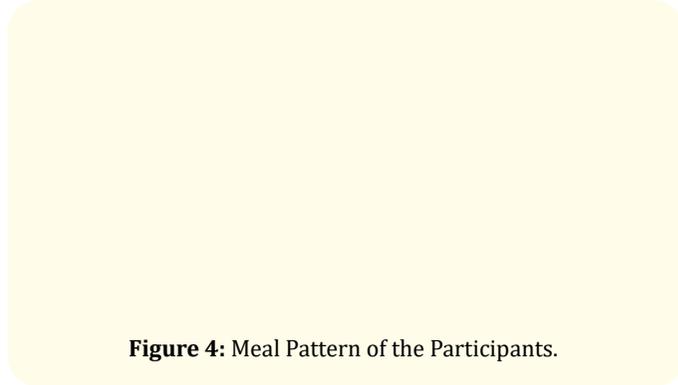


Figure 4: Meal Pattern of the Participants.

Anthropometry is a basic method for estimation of patient's body parameters. This method is one of the oldest methods used in evaluation of human body parameters. It covers a wide variety of measurements such as: body size, structure, and composition. It is very important to be aware of these parameters and to be able to

Figure 1: Associated Health Problems of Doctors and Nurses.

measure them during time differences of persons life (depending on actual observations) [14]. Table 2 presented the somatic status of the study group, where mean weight (70 ± 10.8) of the doctors, irrespective of their age group was higher compared to nurses (57 ± 10.1). The body mass index was calculated using Quetelet index. According to Asian Indian Standard classification the mean BMI, showed that the doctors were obese and had a higher BMI of 25.3 ± 2.5 in comparison to nurses, who were found to be overweight (24 ± 4.6). And it was observed from figure 5A that 47% of the female doctors were obese when compared to male (27%) and although 37% nurses presented normal BMI, 7% were still under weight (Figure 5B). Figure 6 gives a picture of WHR where 27% of the doctors (both female and male) had a WHR >0.90 [Ref- M < 0.90 , F < 0.80] [11] indicating obesity, while among nurses it was only 17%. A comparison of WC and WHR (Table 3, 4) with the standards showed that male doctors had mean WC < 90 cm while, female doctors and nurses had a mean WC greater than the normal. [Ref: male: < 90 cm, female: < 80 cm] [11]. Mean WHR was almost similar among both doctors and nurses (0.88 ± 0.04 , 0.85 ± 0.06). Mid Upper Arm Circumference (MUAC) (28.5) and Triceps Skinfold Thickness (TSF) (21.7) was higher among doctors in comparison with the nurses. Generally, education shapes a person’s knowledge of health, good nutrition and physical activity. In the study group it was seen that, as age increased the doctors became more conscious about their health and nutrition. When somatic status and qualification of doctors was statistically analyzed, irrespective of their age and gender it was found that BMI, WHR and MUAC, were all high indicating an association with their qualification (Figure 7). According to the WHO estimates, the undernourished population in the world has declined and is roughly around 1.2 billion, whereas the over nourished population has increased to 1.2 billion [15]. A study on the prevalence of overweight and obesity among women by Sangeetha G., *et al.* (2016), found 12.7% to be overweight and 29.6% obese. Most of the overweight or obese women belonged to the age group of 40-60 years and prevalence increased with increase in age [16]. A study by Nitin Nahar, *et al.* (2012), on obesity a proven indicator for diabetes, hypertension and dyslipidemia. Showed “association of selected established anthropometric indices of obesity viz BMI, WC and WHR with diabetes, hypertension and dyslipidemia in non-Caucasian population of central India” throws light on the fact that the WC was associated with hypertension, diabetes and dyslipidemia in male and female. Waist-hip ratio showed association with dyslipidemia in female while BMI with hypertension (male) and dyslipidemia (female) [17].

Figure 8 provides the consumption of various food items among the study group which showed that consumption of cereals and pulses was almost 100% and was commonly used on a daily basis. Among the vegetable group other vegetables and roots and tubers were mostly used by the doctors and nurses. 93% doctors used

Anthropometric Measurements and Indices	Mean \pm SD Doctors (n = 30)	Mean \pm SD Nurses (n = 30)
Weight (kg)	70 \pm 10.8	57 \pm 10.1
Height (cm)	167 \pm 10.4	154 \pm 5.9
BMI (kg/m ²)	25.3 \pm 2.5	24 \pm 4.6
IBW (kg)	62 \pm 7.5	52 \pm 4.0
Waist Circumference(cm)	88 \pm 8	83.2 \pm 11
Hip Circumference (cm)	99 \pm 6	97.5 \pm 9.6
WHR	0.88 \pm 0.04	0.85 \pm 0.06
MUAC (cm)	28.5 \pm 2.5	23 \pm 2.0
TSF (mm)	21.7 \pm 5.2	18.2 \pm 4.2
BMR	1459 \pm 155.3	1331 \pm 92

Table 2: Mean \pm SD Anthropometric Measurements and Indices of the Participants.

Figure 5A: Classification of BMI According to Asian Indian Standards Among Doctors.

Figure 5B: Classification of BMI According to Asian Indian Standards Among Nurses.

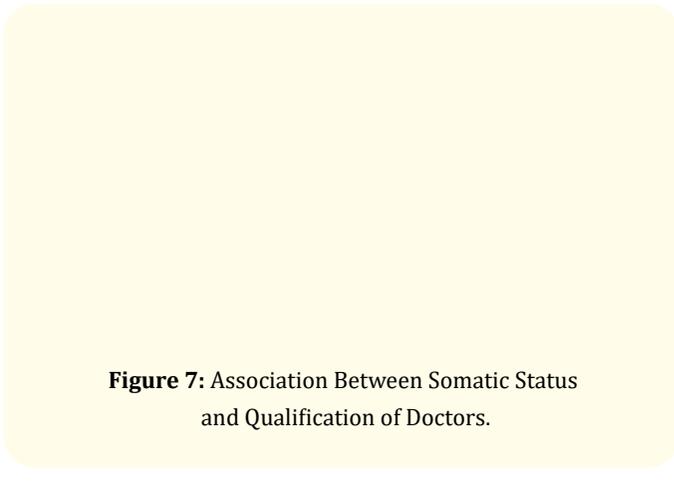
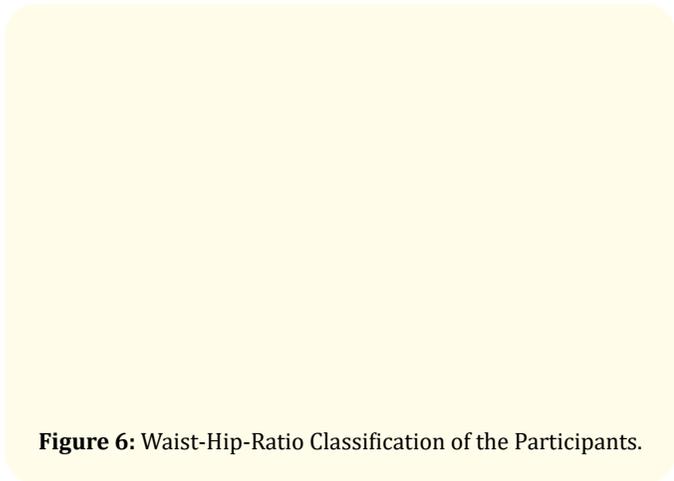


Figure 6: Waist-Hip-Ratio Classification of the Participants.

Figure 7: Association Between Somatic Status and Qualification of Doctors.

Characteristics Doctors	Reference Values	Male (n = 15)			Reference Values	Female (n = 15)		
		Mean	± SD	T-test		Mean	± SD	T-test
Waist Circumference (cm)	< 90	88.7	9.6	0.7 ^{NS}	< 80	87	6.07	6.30*
WHR (Waist-Hip-Ratio)	< 0.90	0.88	0.85	1.2 ^{NS}	< 0.80	0.88	0.03	14.7*

Table 3: Comparison of Doctors Waist Circumference and Waist-Hip- Ratio with Standards.

*Significant at 5% Level; NS: Non Significant.

Characteristics Nurses	Reference Values	Nurses (n=30)		
		Mean	± SD	T- test
Waist Circumference (cm)	<80	88.7	9.6	0.50 ^{NS}
WHR (Waist-Hip-Ratio)	< 0.80	0.88	0.85	1.70 ^{NS}

Table 4: Comparison of Nurses Waist Circumference and Waist-Hip- Ratio with Standards. NS: Non Significant.

fruits daily when compared to nurses which was only 53%. Most of the doctors and nurses took milk and its products regularly, 90% and 87% respectively. As majority of the study group were vegetarians so consumption of egg, chicken, fish and meat was on a lower side. 60% consumed egg or chicken. Only 33% doctors and 30% nurses used fish. Fats and oils and salt showed 100% usage among both the groups daily. It was also good to know that the doctors were using combination of oils rather than single oil in their diet. Fast foods, bakery products and fried foods are weekly consumption by most of the doctors and nurses with a higher percentage seen among the nurses group. 87% nurses used sweets regularly.

The information on mean nutrient intake and adequacy in comparison with the RDA presented in figure 9A and 9B respectively which reveals that among the macro nutrients of doctors the average energy (Male-54%, Female-75%) and protein intake (Male-62%, Female-79%) was less than the RDA except for fat intake which was negatively high with 180% and 260% in male and female doctors respectively and it was statistically significant. Similar results was seen among the nursing group also with energy (62%) and protein (53%) intake being less than the RDA and higher consumption of fat (106%). Most of the micro nutrients were also less than the RDA in both the groups (doctors and nurses). Few nutrients like calcium, sodium and vitamin B1, B2 and C was surprisingly more than the requirement among doctors but it was inadequate among the nurses. Especially female doctors exhibited an adequate intake of vitamin B1 and B2, while calcium (108%), sodium (174%) and vitamin- C (190%) was more than the requirement. Whereas, amongst male doctors vitamins and minerals seemed to be quite low when compared to the RDA except for sodium (145%), phosphorous (167%) and vitamin C (212%). But the scenario of nurses was completely different from doctors where except for calcium (86%), sodium (80%) and magnesium (84%), all the other micro nutrients were very low when compared with the RDA. Iron intake showed an adequacy of 77% in male and 68% in

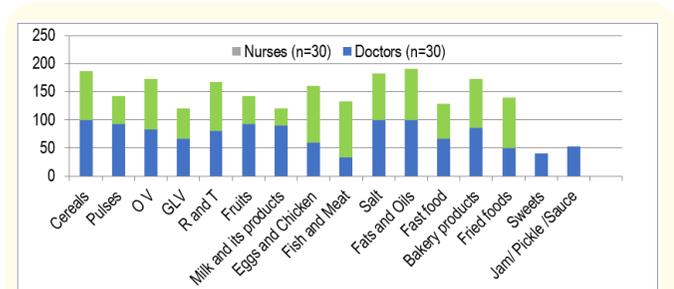


Figure 8: Consumption of Food Stuff.

OV: Other Vegetables; GLV: Green Leafy Vegetable; R and T: Roots and Tuber.

female doctors which shows that they had a deficit of iron in their diet. The mean vitamin B6 was also low among both doctors and nurses (6%). These findings are in consonance with a study by Kalavani AC., *et al.* (2016), who found that nutrition transition over the past 40 years is understood to have resulted in 7% decrease in energy derived from carbohydrates and 6% increase in energy derived from fats [18]. Another study by Sukphal Kaur., *et al.* (2007), observed that where improvement in the standards of living, decrease in physical activities, dependence of men on machine, dietary changes and other life style changes have lead people putting on extra weight.10 In a study by Shobha, (2001) The individual is stated to be under physiological stress only when the body's homeostatic limits are crossed. Thus, in a normal individual, shifting to a high fat diet and lower physical activity is liable to disturb the body's homeostasis leading to a risk of increased body fat and related adult diseases subsequently [19]. Thus there is an urgent need to target education and create awareness to improve the diet and exercise habits of doctors and nursing professionals.

Figure 9A: Mean Macro and Micro Nutrient Adequacy of Doctors in Comparison With the RDA.

Figure 9B: Mean Macro and Micro Nutrient Adequacy of Nurses in Comparison With the RDA.

Recommendations

A balanced tasteful food gives rise to exhilaration, physical strength and vigor, mental competence, nourishment, energy, satisfaction and pleasure. Therefore wholesome diet with cereal combination, importance of vegetables and fruits, meal timings, proper cooking methods to follow was recommended which leads to improved nutrition which in turn triggers off a series of secondary attributes like ageing, promotion of longevity, promotion of immunity against disease, increased vitality and luster of the body. Despite the well-known importance of physical activity for the management and prevention of chronic diseases most of the doctors

and nurses did not increase their physical activity. This illustrates a need for tailored interventions to enhance physical activity and to develop an active lifestyle. Indian population is passing through a transition phase where subsistence conditions are being replaced by plentiful food but reduced physical work and therefore, an understanding of the changing nutritional scene is critical. Healthy food and physical activity provides protection from the health risks of obesity. Thus, nutrition and exercise habits remain key components to promote healthy behaviors among all age groups

Conclusion

The present study concluded that the nutrient intake of doctors and nurses was inadequate and not on par with the RDA except for a few nutrients and most micronutrients seemed to be deficient in the diet. Fat intake was more than the RDA. Obesity was prevalent as indicated by the BMI and WHR. There was no significant difference in the nutrient intake or activity pattern of doctors and nurses. The medical field is facing a hard time with lot of challenges, physically and mentally which may be a cause for following an improper dietary pattern and having a sedentary lifestyle. Therefore, more attention needs to be given to eating healthy and staying active. Making the right food choices is the key factor for medical professionals to prevent chronic diseases and maintain health conditions in their hectic schedules. Eating for good health can, not only reduce the impact of stressors on the body but have a positive influence on their health. Thereby allowing them to care better for patients and themselves.

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