



Dietary Practices of Health Professionals during Working Hours in a Tertiary Referral Teaching Hospital In Ghana: A Neglected Vulnerable Group

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aim: Generally, it is assumed that health professionals are knowledgeable about healthy eating and as such studies aimed at assessing their dietary practices and the factors that influence these practices have been largely neglected. These studies are important because the dietary habits of healthcare professionals (HCPs) can have an impact on their well-being, health status and even their work output. Largely, there is a dearth of information about the dietary practices of HCPs during working hours. This study was aimed at assessing the dietary practices of HCPs during working hours at a referral teaching hospital in Ghana.

Study Design: This was a cross-sectional study in which a questionnaire was administered to 320 HCPs.

Methodology: A questionnaire was administered to the HCPs in the hospital after obtaining informed consent (written) from the HCPs. The questionnaire solicited information about their socio-demographics, dietary practices and nutritional knowledge. Descriptive statistics were summarized as frequencies and proportions.

Results: Approximately 13.1%, 47.5% and 39.4% were underweight, normal weight and

overweight respectively. Carbonated beverages, baked foods and fried foods were consumed four (4) or more times in a week by more than half of the HCPs because they were regarded as convenience foods which could be eaten while working. About 76.9%, 52.8% and 58.4% skipped their breakfast, lunch and supper meal respectively at least once in the past one (1) week before the study.

Conclusions: The findings reveal concerns about the unhealthy dietary habits and basic nutrition knowledge gaps among the surveyed HCPs. Most HCPs skipped breakfast and ate a lot of unhealthy foods such as carbonated beverages, baked foods and fried foods frequently during working hours. Recommendations made include the need for hospital management to provide canteens that serve healthy meals for HCPs at their job sites. There is also the need for management to organize the work-schedules of HCPs in order to manage their workloads in a manner that enables them have adequate breaktimes to access and eat healthy foods while at work.

Keywords: Dietary practices; nutritional knowledge; healthcare professionals; working hours.

1. INTRODUCTION

The working demands of Healthcare professionals (HCPs) poses particular challenges and stressors which can impact on their lifestyle, health and nutritional status. This is because, most employees consume about a third of their total calories during working hours. As such the workplace environment can influence employees' eating behaviours, ultimately affects their well-being and quality of life [1]. In the case of HCPs who fall in the category of shift-workers, they may be engaged in work schedules that can possibly alter their eating patterns. Healthcare professionals (HCPs) may be faced with challenges on deciding on what, when and even where to eat during working hours [2]. Considering the high prevalence of burnout among HCPs as a result of their heavy workloads, and length of work-shifts, recommendations have been made on the need to assess their dietary intakes and nutritional status which can affect their work performance [3]. Monaghan et al. [4] asserted that HCPs are at a higher risk of having unhealthy eating practices because of their workloads and tendencies to prioritize patient care over their own self-care needs, hence their inability to take breaks for meals. For instance, a study reported that more than one-third of nurses rarely or never took meal breaks during their shifts [5]. Consequently, most HCPs are likely not to pay attention to their dietary intakes, but often rely on high-fat, sugary foods and convenience foods rather than consuming the recommended amounts of fruits and vegetables daily [6]. These poor dietary practices among HCPs predisposes them to serious health conditions such as metabolic syndrome, type 2 diabetes, increased risk of cardiovascular diseases and obesity [7].

For example, a study among nurses and midwives in Ghana showed that the prevalence of overweight and obesity among the study participants was 31.8% and 28.9% was attributed to poor dietary practices such as eating late in the night [8].

A study assessing Supervisors' support for nurses' meal breaks and mental health reported that some of the factors that led to unhealthy eating were the failure to take meal breaks during working hours, the absence of healthy foods and lack of advice on healthy eating [9]. Therefore, not allocating periods for meal breaks and the absence of appropriate conditions for meal breaks are barriers to healthy eating which contributes to low job satisfaction [2]. For example, in a study that was undertaken among physicians in Canada, it was revealed that difficulties in accessing adequate nutrition at work was associated with emotional problems (being irritable and frustrated), experiencing tiredness, having difficulty concentrating on tasks given and making poor decisions [10, 11].

Although, health professionals are assumed to be knowledgeable about healthy eating, studies aimed at assessing their dietary practices and the factors that influence these practices have been largely neglected [12]. The scarcity in studies evaluating the dietary practices among HCPs can also be partly attributed to the usual tendency of HCPs and medical students to feel that they are somehow always healthy and immune to illness [13, 14]. However, this perception is not entirely true as it seems and HCPs cannot be considered healthier than their patients [13]. It has been indicated that one way for health professionals to enhance their health

promotion activities among the general population is to follow a healthy lifestyle themselves [12]. Studies have reported that HCPs who engage in healthy dietary practices such as consuming fruits and vegetables daily are more likely to have a positive attitude toward nutrition counseling and have a higher tendency to talk to their patients about these healthy dietary practices [15-18]. When HCPs engage in healthy eating practices, it boosts their confidence level and enables them offer nutrition guidance to their patients, given the higher likelihood that they might have already experienced and applied the principles in their own lives.

However, given the nature of the work of HCPs and the kind of interactions that they make, they are often regarded by the public as healthy role models [19-21]. It is expected that as role models, HCPs should lead by example in matters of healthy lifestyle practices so that the general population may be encouraged and motivated to adhere to the same healthy guidelines. They also play an integral role in providing nutrition-related information to patients and their caregivers after they are discharged from hospitals [21]. By virtue of their role model designation, their health-related dietary practices during working hours may particularly influence that of patients and their caregivers and other people who visit the hospital. This is largely because patients are more inclined to become cognizant of the dietary and health *practices of their health professionals* [21]. Additionally, HCPs are regarded as repositories of credible health information and healthy lifestyles which includes dietary intakes [22].

Due to the fact that HCPs are major actors in promoting healthy lifestyles among population (such as patients), studies are needed to evaluate and monitor the dietary practices of HCPs particularly during working hours when they are in the public domain. The assessment of dietary practices of HCPs during working hours may shed light on some probable external and modifiable workplace factors that affect their ability to eat healthy and its possible consequential health outcomes. A study of this nature will also guide in the planning and implementation of achievable and sustainable interventions for shift-workers like HCPs. Hence, this study was conducted among various categories of HCPs in one major referral and teaching hospital in Ghana to assess their dietary practices during working hours. The study also

assessed the barriers to healthy eating during working hours in the hospital.

2. MATERIALS AND METHODS

2.1 Study Design and Setting

This was a cross-sectional study in which HCPs responded to a questionnaire that was administered at a Major Referral Teaching Hospital in the Southern part of Ghana. This hospital was selected because it offers referral healthcare services to two regions in Ghana and has various departments to cater for varying healthcare needs. It also serves as a teaching hospital where Medical, Nursing and Allied health students are trained.

2.2 Study Participants

The study population consisted of all HCPs who were full-time workers and had worked for at least one(1) year at the referral teaching hospital (RTH). Convenience sampling technique was used to recruit participants for each category of HCP in various departments in the hospital from Monday to Friday. The categories of HCPs that participated in the study included doctors, nurses, midwives, physiotherapists, pharmacists, dieticians, radiographers, sonographers, audiologists and paramedics. A total of 337 HCPs participated in a survey from 9th to 13th November, 2020. Questionnaires were collected from 326 HCPs and 6 questionnaires that were poorly written and not completed in most sections were excluded from the study, thus 320 (response rate of 94.9%) were finally used for the data analysis.

2.3 Questionnaire Development and Validation

A self-administered questionnaire was distributed to the HCPs at a Referral Teaching Hospital in Ghana and was completed by 320 HCPs. Literature and other questionnaire tools guided the development of the questionnaire for this study. The questionnaire that was administered to the HCPs was a modified version of previous related studies on eating practices of HCPs and shift workers that were conducted in Australia [2], Mexico [12], Saudi Arabia [7] and South Africa [23]. To verify the questionnaire, experts (registered dieticians and nutritionists) were consulted and the instrument was pretested using 15 HCPs working in a University hospital.

After this approach was conducted, a final version of questionnaire was created. The questionnaire included the following: participants' demographic profile section, which included gender, age, race, profession, highest level of education attained, work experience, whether they had attended seminars related to Nutrition or were taking any nutritional supplement at the time of the study. The second section of the questionnaire assessed their nutritional knowledge levels and dietary practices during working hours for a period of one(1) week prior to the day of data collection.

2.4 Data Collection

A pilot sample of 15 HCPs in a University Hospital were used to test the validity of questions in the questionnaire before administering the final questionnaire. The results from the pretest confirmed the adequate comprehensibility and clarity of the survey. The reliability of the questionnaire was assessed on the basis of responses from the 15 HCPs during pretesting of the instrument. This enabled the researchers to determine how the items relate to each other. The test-retest method was used to assess the reliability of the instrument. A Cronbach's alpha coefficient value of 0.92 was obtained for the pretested instrument. On the basis of using a scale from 0.00 (very unreliable) to 1.00 (very reliable) [24], the questionnaire was considered to have a high *internal consistency* of the *items* measured and hence was considered reliable. The questionnaires were hand distributed by the researchers to participants at their various departments in the hospital and collected back on the same day after completion.

2.5 Assessment of Nutritional Knowledge

The nutritional knowledge of the health workers was assessed with a questionnaire. The questionnaire had fifteen (15) closed-ended questions with four answer options for each question of which participants were required to select one option as the right answer for each question.

2.6 Dietary Assessment

The questionnaire explored participants dietary practices by presenting a list of food groups (Grains, roots and tubers, Legumes and nuts, Dairy products, Flesh foods/ Processed meats, Eggs, Fruits, Vegetables, Vitamin A-rich foods and vegetables, sweet foods, carbonated

beverages with sugar, tea, coffee, alcoholic beverages, fruit juices and fast foods. Participants were asked to indicate whether they consumed these foods rarely (1- 3 times a week), frequently (4 or more in a week) or never consumed it within the past one week prior to the study. The questionnaire also inquired from participants whether they brought food from the house to the workplace, bought food from the hospital canteen or ordered food to be delivered to them from restaurants. Participants also reported the frequency of breakfast, lunch and supper intake in the past one (1) week before the study.

2.7 Opinions about Food at Workplace

The questionnaire had a list of food items that were usually sold at the hospital premises by food vendors (dairy foods, baked foods/pastries, fried food, carbonated beverages /soft drinks/minerals, alcoholic beverages, meat products, fruit juices). Study participants were asked to indicate the number of times (1-5 times or more) that they consumed those food items in the previous week before data collection. Participants were also asked to indicate whether their preferences with respect to the foods sold at the hospital premises. Participants were also required to indicate whether foods sold at the hospital canteen was expensive or cheaper compared to buying out of the hospital or cooking one's own meal for work.

2.8 Definition of Unhealthy Dietary Practices Applied to Study

Unhealthy dietary practices were assessed in accordance with the guidelines given by the World Health Organization [25]. The guidelines generally entail (i) having a consistent scheduled eating time during working hours; (ii) food composition (reducing intake of foods high in calories, fat, sugars and salt, eating enough fruits, vegetables; (iii) the WHO(2018) [25] emphasizes that a healthy diet balances calorie consumption with energy expenditure and should emphasize a balance of protein, fibre-rich carbohydrates and unsaturated fats, with no trans-fats and limited intakes of free sugars, saturated fats and salt.

2.9 Anthropometric Assessment

The height and weight of the HCPs were taken using a stadiometer and a weighing scale

respectively. The weight (kg) was divided by the square of the height (m²) to estimate the Body Mass Index (BMI) of each participant.

2.10 Statistical Analysis

The data were entered on a Microsoft Excel spreadsheet. The Excel files were cleaned by identifying and deleting inaccurate and incomplete data and was subsequently exported to the Statistical Package for Social Sciences (SPSS, version 20) – for descriptive and inferential analysis. Descriptive statistics were run to summarize the data collected; and the results were displayed in frequencies and percentages for the variables being investigated. Pearson's correlations were calculated to assess the relationship between some dietary practices and the demographic variables. A statistical significance level of ($p < 0.05$) was applied in this study.

3. RESULTS

3.1 Socio-Demographic Characteristics and Nutritional Status of the Healthcare Professionals

The socio-demographic characteristics and the nutritional status (assessed using the BMI anthropometric indicator) of the participant are summarized in Table 1. Majority (80.0%) of the study participants fell within the age group of 21-30 years indicating that our study sample were largely in the youthful stage of life. Most (42.5%) of the respondents had attained education to the

Bachelors degree level. A higher proportion (88.1%) of the respondents had working experience of between 1 and 5 years. Most(55.0%) of the study participants were nurses who form the highest proportion of healthcare professionals in the world [26]. Table 1 indicates that majority (88.4%) had not attended any workshop or seminar on Nutrition suggestive that the area of Nutrition is generally not given the needed attention or priority among HCPs.

With respect to the nutritional status of the respondents, Table 1 indicates that 13.1%, 47.5% and 39.4% were underweight, normal weight and overweight respectively.

3.2 Nutritional Knowledge Levels of Respondents

The HCPs were presented with 15 questions that sought to assess their nutritional knowledge in basic nutrition. Each question had 4 answer options and respondents were required to choose only one option for each question. The findings regarding the nutritional knowledge of the HCPs is presented in Table 2. The results in Table 2 show that for 12 questions, less than half of the respondents provided the correct answer. It is only for three questions that more than 50% of the HCPs knew that fruits and vegetables have preventive effect on various types of cancer, deficiency of iron could lead to anaemia and high intake of sodium could lead to high blood pressure/hypertension.

Table 1. Socio-demographic and nutritional status information of respondents

Variable	Options	Frequency	%
Gender	Male	148	46.25
	Female	172	53.75
Age	21-30	256	80.0
	31-40	56	17.5
	41-50	8	2.5
Educational Level	Certificate	32	10.0
	Diploma	108	33.7
	Post Diploma	8	2.5
	Bachelor's degree	136	42.5
Work experience	Master's Degree	36	11.3
	1 to 5 years	282	88.1
	6 to 10 years	26	8.1
	11 to 15 years	12	3.8
Profession	Doctor	38	11.8

Variable	Options	Frequency	%
Nutritional Status (BMI)	Midwife	28	8.8
	Nurse	176	55.0
	Physiotherapist	18	5.6
	Pharmacist	16	5.0
	Lab. Technician	32	10.0
	Dietitian/Nutritionist	12	3.8
Attendance to Nutrition Workshop	Underweight	42	13.1
	Normal	152	47.5
	Overweight	126	39.4
Studied at least one(1) nutrition course during training	Yes	37	11.6
	No	283	88.4
Studied at least one(1) nutrition course during training	Yes	297	92.8
	No	23	7.2

Table 2. Nutritional knowledge of respondents

Shortened Question	Correct Answer	Percentage (%) answered correctly
Dietary recommendations for salt intake per day	5g	14.6
Nutrient required for regulating and maintaining normal blood pressure	potassium	29.3
Two rich food sources for regulating and maintaining normal blood pressure	banana and coconut water	28.3
Food group has preventive effect on various types of cancer	fruits and vegetables	53.3
Foods containing this dietary substance can help regulate blood sugar level	fiber	26.4
Nutrient associated with the prevention of neural tube defect	folic acid	46.7
Body Mass Index (BMI) value that indicates Obesity	30kgm ⁻²	37.0
Healthiest type of fat	Unsaturated fatty acid	24.5
Example of food item with healthiest type of fat	avocado pear	28.5
Two rich food sources of folic acid	cooked black-eyed beans and spinach	20.4
Deficiency of nutrient could lead to anaemia	Iron	67.3
Deficiency of nutrient could lead to poor concentration and becoming easily tired when working	Iron	32.5
Nutrient can help in iron absorption	Vitamin C	18.6
High intake could lead to high blood pressure/hypertension	Sodium	62.4
Two rich food sources of Zinc	red meat and eggs	39.2

3.3 Frequency of Consumption of Foods Groups by Respondents

Using a scale of rarely consumed (between 1 and 3 times in a week), frequently eaten (4 or more times in a week) or not consumed in past one week, the HCPs were required to indicate the frequency of consuming food items under 12 food groups that were presented to them. The dietary intake of the participants in the previous

one week prior to data collection is presented in Fig. 1. It is evident from Fig. 1 that the food groups frequently consumed by more than 50% of the HCPs were carbonated beverages, baked foods (pastries), fried foods. Contrary, more than half of the HCPs rarely consumed fruits and vegetables. Again, a higher proportion (60.3%) of the HCPs reported that they never consumed any dairy food product in the past week prior to the study. Fig. 1 shows that a higher proportion

of the HCPs reported that they frequently (4 or more times per week) consumed baked foods(pastries), fried foods, carbonated beverages (soft drinks) and fruit juices. However, majority of the HCPs indicated that they rarely (1-3 times per week) consumed fruits or vegetables in the past one week before the study. In the case of dairy foods and alcoholic beverages, most of the HCPs indicated that they did not consume them in the past one week prior to the study.

3.4 Information on Dietary Practices of Healthcare Professionals

The dietary practices of the respondents in the past one(1) week prior to data collection are presented in Table 4. The results indicate that majority (76.9%) of the HCPs skipped their breakfast meals at least once in the past week prior to the study with the main reason being rushing to work on a morning shift. Similarly, more than half -52.8% and 58.4% - of the HCP indicated that they missed their lunch or dinner meal at least once respectively in the past week before the study. The major reason given by

those who skipped either their lunch or supper meal was that they were busy at work and therefore unable to eat or had an emergency to attend to at work. Majority (79.1%) of the HCPs reported that they ate a snack daily in the past week before data collection. The three most preferred snack food items as indicated by the HCPs were soft drinks/carbonated beverages (39.4%) pastries (21.0%) and roasted plantain with groundnuts (13.1%). During the past week before the study the three major types of snacks there were consumed 4 or more times during working hours by the HCPs were soft drinks/carbonated beverages (44.7%) pastries (19.6%) and fruit juice (10.6%). The result from Table 3 shows that a little over half (50.3%) of the HCPs indicated that they drank between 4 and 6 sachets(2000ml-3000ml) of water daily. The major factor that informed the choice of a snack during working hours was convenience and how easily it can be eaten while working at the same time. The responses of the HCPs revealed that assessing the healthiness of the food item as a snack was the factor least considered before choices were made.

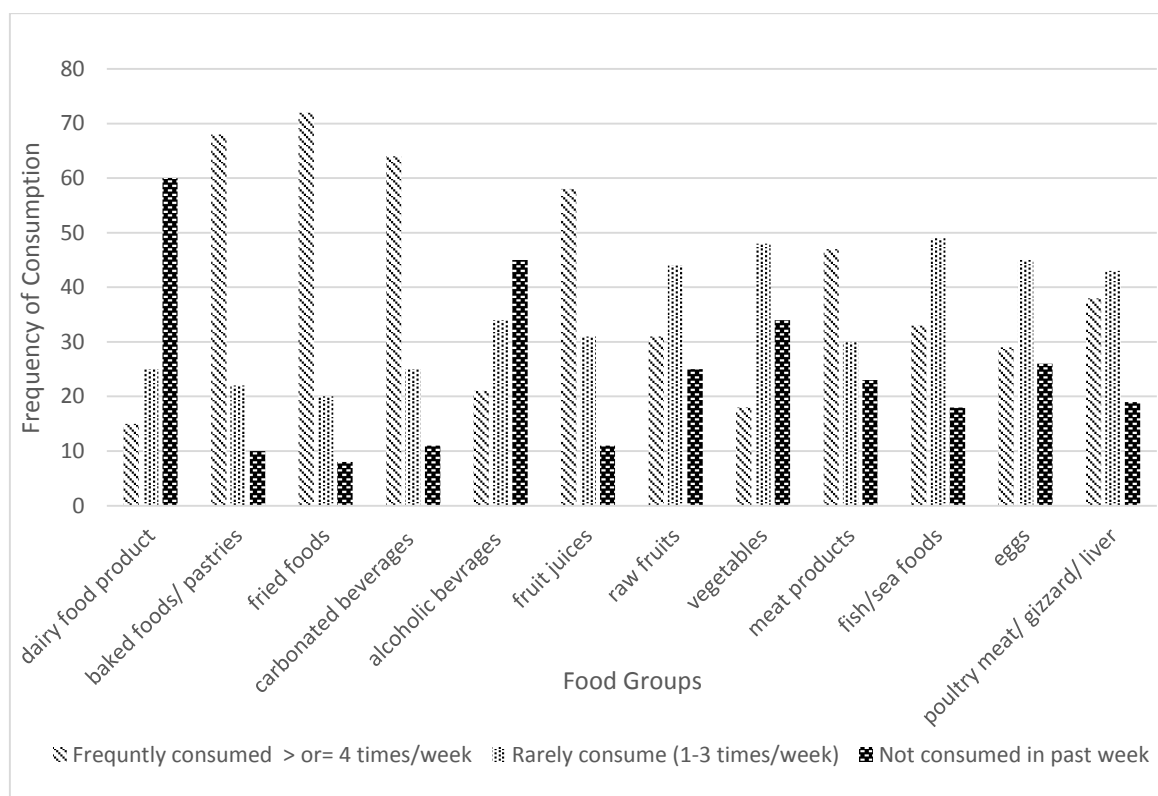


Fig. 1. Frequency of intake of food groups by study participants

Table 3. Dietary practices of healthcare professionals

Shortened Question	Frequency	Percentage
Breakfast intake frequency/week		
Daily	53	16.6
<7	246	76.9
Never ate breakfast entire week	21	6.5
Major reason for skipping breakfast (n= 267)		
Rushing to work (morning shift).	93	34.8
worked during the night to early morning shift	77	28.8
Had to attend to an emergency at work	56	21.0
Did not eat breakfast early, but ate a heavy meal between 11- 12pm (Brunch)	41	15.4
Lunch intake frequency/week		
Daily	140	43.8
<7	169	52.8
Never ate lunch entire week	11	3.4
Main reason for skipping lunch (n=180)		
Busy at work and unable to eat/ had emergency to attend to at work	102	56.7
Hurrying up for afternoon shift	45	25.0
Meal preferred was not available	33	18.3
Supper/Dinner intake frequency/week		
Daily	124	38.8
<7	187	58.4
Never ate supper entire week	9	2.8
Main reason for skipping dinner/supper (n=196)		
Busy at work and unable to eat/Had emergency to attend to at work	99	50.5
Hurrying up for night shift	67	34.2
Didn't get time to cook and eat before evening work	30	15.3
Frequency of snack intake/ per week		
Daily	253	79.1
<7	49	15.3
None	18	5.6
Type of snack usually preferred during working hours		
Soft drinks (alvaro, malt, sprite, coke)	126	39.4
Pastries (meat pie, cake, doughnut)	67	21.0
Roasted plantain	42	13.1
Ice cream/yoghurt	34	10.6
Fruit juice	31	9.7
Fruits (pineapple, banana, water melon)	20	6.3
Type of snack consumed (>4 times) during working hours in past 1 week		
Soft drinks (alvaro, fanta, sprite, coke)	143	44.7
Pastries (meat pie, cake, doughnut)	63	19.6
Fruit juice	34	10.6
Roasted plantain	24	7.5
Ice cream/yoghurt	21	6.6
Fruits (pineapple, banana, water melon)	21	6.6
Fried gizzard keebab	14	4.4
Major factor that informs choice of snack while working		
Convenience /can be eaten while working	183	57.2
Readily available	81	25.3
Healthiness of food	56	17.5
Consumed energy drink in past week		
Yes	216	67.5
No	104	32.5

Shortened Question	Frequency	Percentage
Bottles of Energy Drink consumed in past 1 week (n=216)		
(350ml per bottle)		
<i>1-2 bottles</i>	64	29.7
<i>3-4 bottles</i>	107	49.5
<i>>4 bottles</i>	45	20.8
Volume of water usually consumed during working hours (sachet or bottled water/ 500ml)		
<i>1- 3 sachets (500ml-1500ml)</i>	121	37.8
<i>4 - 6 sachets (2000ml-3000ml)</i>	161	50.3
<i>>6 sachets (>3000ml)</i>	38	11.9
Frequency of fast-food intake per week.		
<i>Daily</i>	169	52.8
<i><7 times</i>	82	25.6
<i>None</i>	69	21.6
Where lunch meal is usually obtained/bought from when at work?		
<i>Restaurant near hospital</i>	103	32.2
<i>Hospital restaurant</i>	91	28.4
<i>Delivery from restaurant more than 5km away from hospital</i>	52	16.3
<i>Bring packed food from home when coming to work</i>	74	23.1
Impression about food bought during working hours (n=246)		
<i>Expensive</i>	127	51.6
<i>Preferred dishes often run out quickly</i>	52	21.2
<i>Portion sizes served does not satisfy one's hunger</i>	35	14.2
<i>Preferred dishes are not cooked daily</i>	32	13.0
Policy on taking breaks to eat during working hours in department		
<i>Yes</i>	74	23.1
<i>No</i>	246	76.9
Recommendations to improve dietary intakes of HCP during working hours		
<i>Provide meals for staff at hospital canteen at subsidized prices</i>	193	60.3
<i>Nutrition education for staff on healthy dietary lifestyles</i>	78	24.4
<i>Hospital management must give priority to dietary intakes of staff</i>	49	15.3

The results also revealed that a higher proportion (67.5%) of the HCPs reported that they had consumed energy drink in the past week prior to the study. Approximately 70% of those who had drank an energy drink indicated that they consumed at least 3 bottles (1050ml) during the week. With respect to water intake, about half of the participants (50.3%) reported that they drank between 4 and 6 sachet of filtered water equivalent to between 2000ml and 3000ml respectively.

The HCPs mainly bought lunch meals either from restaurants away from the hospital's premises or from the hospital's canteen. However, majority (51.6%) of those who bought lunch meals during working hours indicated that foods sold were expensive. Additionally, more than half of the respondents (60.3%) recommended that to ensure that HCPs eat healthy during working

hours, meals should be prepared at the hospital canteen specifically for staff and sold at a subsidized price during working hours.

3.5 Relationship between Dietary Practices and Demographic Variables

Data collected on intake of breakfast, lunch, supper, snacks and fast foods over the past seven(7) days before the study was re-categorized into two (≥ 5 times/week or < 5 times/week) to assess the frequency of consumption per week for the HCPs. Results of the Pearson's correlation test ran to assess the association between some dietary practices (frequency of consumption of three daily main meals, snack and fast-food intakes and some demographic variables are presented in Table 4.

Table 4. Relationship between dietary practices and demographic variables

Dietary Practices	Frequency of consumption per week	n(%)	Pearson's correlation and <i>p</i> -value			
			Gender	Age Group	Work Experience	Educational Level
Breakfast	≥5times/week	118(36.9)	$r = 0.972$,	$r = 0.923$,	$r = 0.073$,	$r = 0.064$,
	< 5 times/week	202(63.1)	$p = 0.243$	$p = 0.039^*$	$p = 0.382$	$p = 0.572$
Lunch	≥5times/week	218(68.1)	$r = -0.062$,	$r = 0.089$,	$r = -0.058$,	$r = -0.093$,
	< 5 times/week	102(31.9)	$p = 0.308$	$p = 0.514$	$p = 0.862$	$p = 0.438$
Supper/ dinner	≥5times/week	237(74.0)	$r = -0.026$,	$r = -0.082$,	$r = -0.007$,	$r = -0.052$,
	< 5 times/week	83 (26.0)	$p = 0.630$	$p = 0.638$	$p = 0.784$	$p = 0.727$
Snack intake	≥5times/week	228(71.3)	$r = 0.938$,	$r = 0.079$,	$r = 0.068$,	$r = 0.073$,
	< 5 times/week	92(28.7)	$p = 0.052$	$p = 0.613$	$p = 0.857$	$p = 0.542$
Fast-food intake	≥5times/week	231(72.2)	$r = 0.078$,	$r = 0.952$,	$r = 0.038$,	$r = 0.056$,
	< 5 times/week	89(27.8)	$p = 0.752$	$p = 0.035^*$	$p = 0.573$	$p = 0.862$

The results in Table 4 indicate that a high proportion of the study participants never ate or skipped breakfast (63.1%) up to four (4) times in the past one (1) before the study as compared with lunch (31.9%) and dinner (26.0%) meals. Age was found to be significantly and positively correlated with breakfast intake per week ($r = 0.923$, $p = 0.039$). The results indicate that as the age increased, the frequency of consuming breakfast meals also increased. Again, Age was found to be significantly and positively correlated with consumption of fast-foods per week ($r = 0.952$, $p = 0.035$). The results suggest that as the age increased, the frequency of consuming fast-food meals also increased.

4. DISCUSSION

This study examined the dietary practices of different categories of healthcare professionals during working hours at a Referral and Teaching Hospital in Ghana. The study results revealed that although 47.5% of the respondents had a normal BMI, more than a third (39.4%) were overweight. Similar high prevalence figures of overweight were reported in previous studies that were conducted among professional healthcare workers mainly nurses and midwives in Ghana - Kadjebi District (38.0%) [27], Hohoe Municipality (31.8%) [8] and Sefwi-Wiawso Municipal Hospital (38.39%) [28]. Generally, the prevalence of overweight among the surveyed HCPs can be described as high and of public health concern. From their responses with regard to their lifestyle and dietary practices, some of the contributory factors to this high prevalence of overweight could be as a result of skipping breakfast as indicated in a systematic review [29] and snacking on energy-dense, fatty and sugar-loaded foods [30]. The findings revealed that approximately 76.9% of the HCPs reported that

they skipped breakfast at least once in the past one(1) week prior to the study because they were rushing to work (morning shift), worked during the night to early morning shift or had to attend to an emergency in the morning at work. These reasons have been reported to be some of the major determining factors for unhealthy eating practices among HCPs at the workplace in other similar studies [4,7]. The implication of inconsistent meal patterns, especially skipping breakfast is that, it has a higher tendency of causing people to snack on high-calorie foods of poor quality [31] and eat more in large portion sizes during *lunch* [29].

Health workers in this study reported that they rarely consumed fruits and vegetables but frequently consumed carbonated soft drinks, pastries and fried foods because these were the only food items available for sale at the hospital's premises. These reports from the HCPs was also confirmed by an observation made by the researchers at the hospital's premises. The observations made by the researchers is supported by Monaghan's et al. [4] study among nurses who found out that one major factor that influenced the eating practices of HCPs was the presence of unhealthy food options within the hospital setting. In addition, these food items were consumed mainly as snacks during working hours because they were perceived by the HCPs as convenience foods which could be "*nibbled on*" while working. In a study among nurses, these foods were described as "quick", "eat on-the-run" or "eat on-the-fly" foods [4].

Again, findings from this study also revealed that the HCPs at the Referral Teaching Hospital generally had poor nutritional knowledge supported by other related studies [32-34]. The poor nutritional knowledge of the HCPs can be

attributed to the less opportunities given to HCPs to attend nutrition-related seminars, workshop and continuous professional development programmes. This is reflected in Table 1 where more than half (88.4%) of the respondents had not attended any nutrition-related seminars, workshop and continuous professional development programmes before. The implication of this poor nutritional knowledge level is that it may result in reduced involvement of HCPs in patients' nutritional care, insufficient nutritional practice among HCPs where they will not be in a better position to offer nutritional guidelines in the management of particularly chronic conditions such as hypertension, diabetes, chronic kidney diseases. Indeed, studies that were conducted among HCPs reported that one of the common causes of insufficient nutritional practice among health professionals was the lack of nutritional knowledge [32, 35, 36]. The study findings suggest that the HCPs lacked knowledge on the role of nutrients, food sources and dietary recommendations of nutrients as indicated in previous related studies [37, 38]. This finding therefore suggests the need to revise the course content of nutrition courses taught in health training institutions and also organize more continuous professional development programmes in Nutrition for HCPs while they work. The implication of this finding is that HCPs who work in facilities with no Dieticians/Nutritionists will not be in a better position to offer nutritional counselling and guidelines to hypertensive, diabetic, obese and pregnant women. In the case of the HCPs, their lack of knowledge about the role of iron in improving one's concentration level and reducing fatigue while working may affect their own work output and performance.

With regard to the dietary practices of the HCP, the results revealed that a greater proportion of the HCPs skipped breakfast more than lunch and supper meals supported by findings in a related study that was conducted among nurses in South Africa [23]. The implications of skipping breakfast include an increased susceptibility to cardiometabolic risk factors such as obesity, weight gain, high blood pressure, unfavorable lipid profiles, diabetes, and metabolic syndrome [39, 40]. In the case of health professionals who do not eat breakfast regularly, it may have an impact on their concentration and alertness level, short-term memory and cognitive functioning, which are precursors of low work productivity and efficiency [41]. Another consequence of skipping

breakfast regularly is its potential negative effects on mood behaviours, emotions and exacerbation of stress levels [42] which may "drive-away" clients or customers to health facilities. Besides, it is generally known that skipping meals slows down one's metabolism, which can cause weight gain or makes it harder to lose weight. It has been asserted that when one skips a meal or waits for a long time without eating, it forces the body to go into a survival mode. Ultimately, this results in triggering the craving sensations of the body for food which causes one to eat a lot [43].

According to Al Hazmi et al. [7], the availability of food items in terms of quality, accessibility, and affordability are some factors that influence health workers to maintain a healthy dietary habit during working hours. Therefore, it is not surprising that results from this study showed that majority of the HCPs described the food available at the hospital canteen as expensive and therefore were less preferred by them. Rather almost half of the HCPs bought food from restaurants that were either nearby or more than 5km away from the hospital. In the study by Al Hazmi et al. [7], they reported that high workload, inadequate break time and high prices of food sold at health facility canteens were the commonest reported barrier to healthy eating at work in our study. The implications of buying cooked food away from the hospital's premises is that HCPs may have to spend more time to travel to these restaurants and may not be within reach easily around the hospital to attend promptly to emergencies that may occur in the hospital while they are far away for a lunch break. Another implication of having to access lunch meals from locations far from the hospital rather than a ready source of workplace foodservice is the tendency to facilitate unhealthy eating practices such as skipping meals during working hours as found in this study population where more than half skipped lunch at least once in the week. This finding is confirmed by a related study where skipping of meals was significantly associated with not having access to workplace foodservices in a Korean adult workers population, after adjusting for all confounding factors [44]. Another implication of skipping lunch meals probably to attend to emergencies or due to work pressure demands is its tendency to result in reducing positive moods, increasing stress and hunger levels while working [45]. Although majority indicated that the main reason for skipping lunch was because they were busy at work or had an emergency and therefore were unable to eat, about 18.3% also indicated that

the food they preferred was not available at lunch time. This finding of not having access to one's meal preference during lunch time has implications on the need to ensure the availability of workplace foodservices for HCPs to enable them readily have their meal preferences which can potentially reduce poor eating behaviours such as skipping meals.

The findings revealed that generally, most of the HCPs consumed energy drinks corroborating with previous studies that were conducted among nurses [46, 47]. Although, in the current study, the participants were not asked to give reasons why they drank energy drinks, Dorrian et al. [46], found that nurses consumed energy drinks to help relieve excessive fatigue and stress associated with their work schedules. Higbee et al. [47], also reported that some nurses working long shifts consumed energy drinks because they had the perception that energy drinks boost energy levels quickly and also enabled them stay awake in the night to work. The implications of excessive consumption of energy drinks on HCPs was reported by Higbee et al. [47] who found out that nurses who consumed energy drinks had significantly poorer sleep quality, slept for fewer hours and reported increased levels of stress compared with non-energy drink consumers. Ample evidence from previous studies indicate that long-term poor sleep quality and *sleep deprivation* are strongly associated with reduced cognitive and psychomotor performance and impaired critical thinking among HCPs [48]. Reduced sleep quality as a result of frequent intake of energy drinks can lead to attention and alertness lapses thereby diminishing the quality of care provided by HCPs and has an impact on patient safety and workplace productivity [49-51].

The water consumption practices of the HCPs can generally be described as poor, since only about 11.9% reported that they drank more than 3000ml of water daily as compared to the recommended intake of 2700ml and 3700ml for males and females respectively. The low water intake practices of the HCPs are supported by related studies that were undertaken in Malaysia [52], Saudi Arabia [53] and United Kingdom [54]. There have been concerns that whereas health professionals ensure that their patients drink enough fluids, they do not care much about their own hydration status. The implications of inadequate water intake or dehydration on the work performance of HCPs include impairment in short-term memory and cognitive function, errors

in visual perception, reduced psychomotor ability, alteration in mood, fatigue, difficulty in concentrating, headaches, irritability and sleepiness [54, 55].

The HCPs who participated in this study proposed some important solutions to address problems associated with meeting their dietary needs during working hours. These solutions included allowing for adequate break times and providing more healthy foods and drinks options that should be readily available and within their reach at the various workstations in the hospital. Healthcare professionals in the Referral Teaching Hospital proposed that another solution that can help them adopt good dietary choices at the workplace is that foods sold at the hospital's canteen should be at subsidized and affordable prices. According to Banwat et al. [56] a health facility canteen is expected to provide a varied selection of fresh and healthy foods in ideal settings therefore stakeholders and management of the facility should see to it that healthy foods which includes cooked foods are provided at the hospital canteen at a reasonable price.

5. LIMITATIONS OF STUDY

The findings of this study have to be considered in light of some limitations. One limitation of this study is potential selection biases because only HCPs who were on duty during the day and not night for the five working days participated in the study. This makes it impossible to generalize the findings to the other HCPs who were on duty during the night or weekends. Again, another potential limitation is that the study relied on willing volunteers (self-selected participants). Self-selected participants may be conscious about their health and motivated to improve their health status as compared with those who do not respond to requests for participants, affecting the generalizability of study's results.

Another limitation associated with this study is the self-reports of the HCPs on their dietary intakes and usual eating practices. The self-reports of food intake by the HCPs can be biased by their tendency to provide responses consistent with expected norms (social approval bias) when in reality they might be doing otherwise (for example not eating fruits and vegetables daily).

Furthermore, information obtained from the HCPs on consumption of the different food groups, eating practices, consumption of snacks,

fast foods and usual intake of water on a daily basis were based on HCPs' memory recall, which might have introduced recall bias in this study.

Despite these limitations, in our view there are some notable strengths to this study. To the best of our knowledge, this is the first study to explore the eating practices of HCPs during working hours in a Referral teaching hospital setting in Ghana. The study also considered the various categories of HCPs to obtain their wide range of views. The study revealed barriers and challenges to healthy eating during working hours from the opinions of the HCPs. Hence, the findings can be valuable in guiding the design of appropriate interventions to promote healthy-eating among HCPs in hospital settings.

6. CONCLUSIONS

This study clearly demonstrates that a significant percentage of the HCPs adopt several unhealthy dietary practices at work. Most HCPs skipped breakfast meals and ate a lot of unhealthy foods. A higher proportion of the HCPs consumed carbonated beverages, baked foods and fried foods frequently – four (4) or more times in a week- mainly because they were regarded as convenience foods which could be eaten while working. Urgent nutrition education programmes and interventions are therefore required among HCPs to promote healthy eating practices during working hours. Hospital management may need to review and devise other strategies to improve the eating practices of HCPs during working hours. There is a need to ensure the availability of healthy foods and beverages options in hospital canteens for hospital staff which will contribute to decreasing the burden of overweight, obesity and other related health conditions among HCPs. Again, findings regarding the nutritional knowledge of the HCPs highlights the need for improvement in nutrition education among health students during their training and even while working.

7. RECOMMENDATIONS

On the basis of the study findings, the following recommendations were made to inform best practices of the Hospital's management and other stakeholders interested in promoting healthy dietary practices among HCPs during working hours.

1. The Hospital management can consider to facilitate the introduction of healthy food options at reasonable prices in the hospital's canteen and at different locations that are within easy-reach and access by staff at the hospital premises.
2. Management can collaborate with the Dietetic Department of the Hospital to organize nutritional continuous professional development workshops and seminars for the HCPs in order to increase their nutritional knowledge. There is also the need for Dietitians in the hospital to create awareness among HCPs on the importance of choosing healthy foods, ensuring optimal hydration and effects of excessive intake of energy drinks.
3. To Nutrition and Mental Health Researchers, further studies involving different practice settings and health professions is recommended to explore HCPs' dietary practices and its impact on their physical and mental well-being as well as their work performance.
4. A recommendation for further study is the need to assess whether HCP specialty/category determines or influences dietary practices during working hours.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

Written and signed informed consent was obtained from all study participants involved in the study.

ETHICAL APPROVAL

The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Cape Coast Teaching Hospital Human Research Ethics Committee (IRB number: CCTHERC/EC/2020/025)

DATA AVAILABILITY

The data presented in this study are available on request from the corresponding author pending ethical approval from the Cape Coast Teaching Hospital Human Research Ethics Committee. The data are not publicly available due to privacy restrictions.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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