

The mismatch between canteen guidelines and their implementation at canteens in medical institutions in Anuradhapura District

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(Index words: implementation, canteen, guidelines, medical-institutions, Anuradhapura)

Abstract

Introduction: The 'Guidelines for a healthy canteen in workplaces' (guidelines) was published in 2013 by the Ministry of Health to improve food choices and healthy eating of working community.

Objectives: To determine the extent of implementation of guidelines in canteens at medical institutions in Anuradhapura District.

Methods: A descriptive cross-sectional study was conducted on random working days in canteens providing all three main meals in medical institutions in Anuradhapura District in August and September 2018. Data were collected by observing the canteen and interviewing the canteen owners according to guidelines. Scoring was done according to a scoring system to obtain a percentage.

Results: Ten canteens were included in the study. The median number of customers per canteen was 200 (IQR 100-625). The highest and lowest scores by canteens for overall implementation were 41.8% and 14.1%, while the mean among all canteens was 29.2%. Average percentages for healthy carbohydrate, fruit, snacks, and oil options were 15.2%, 20.0%, 8.8%, and 28.2% respectively. Availability of healthy dairy and use of standard coconut oil was 0.0%. Safe drinking water and hand-washing with soap were available only in 6 and 4 canteens respectively. Implementation of food safety measures was 32.5%. None of the canteens had any posters/guides regarding healthy eating and none of the owners were aware of the guidelines.

Conclusions: The level of implementation of the canteen guidelines was highly unsatisfactory among the canteens in medical institutions in Anuradhapura District.

Introduction

Food is vital in the maintenance of health. Food-based interventions are used in both curative and preventive intentions. Evidence shows food reduces the risk of cancer, cardiovascular disease, hypertension, osteoporosis, inflammation, type II diabetes and dyslipidaemia [1].

Today 70% of deaths are due to non-communicable diseases (NCDs) worldwide and 25% die before 60 years [2]. Even in Sri Lanka, the prevalence of NCDs is rising. Deaths from NCDs contribute to 83% of deaths in Sri Lanka [3].

The prevalence of diabetes has risen from 2.5% in 1990 to 10.3% in 2005 [4]. The prevalence of hypertension is 23% in 2006 [5]. The prevalence of dyslipidaemia is 23% in 2015, and the prevalence of obesity (BMI >25 kg/m²) has risen from 20% in 2006 to 30% by 2015. More than 90% of the Sri Lankan adults were estimated to have at least one of the NCD risk factors [6,7]. Consumption of excessive carbohydrates and fats in contrast to fruits and vegetables are the main deficiencies in dietary habits which result in NCDs [8].

The WHO ranks the environmental hazards in the working environment among top risk factors for NCDs [9]. Creating healthy eating at workplaces is considered an important strategy to prevent NCDs [10].

The 'Guidelines for a healthy canteen in workplaces' (canteen guidelines) was published in 2013 by the Nutrition Division – Ministry of Health, Sri Lanka, in collaboration with the WHO. It has justified the need for such a guide as it has identified that canteens at workplaces are filled with unhealthy food items. However, there has been no follow-up study to identify the extent of implementation of the canteen guidelines [11].

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Health institutes and health staff are expected to be role models for other communities and institutes with regard to health initiatives [12].

We decided to conduct this as a pilot study to determine the extent of implementation of 'guidelines for the healthy canteen in workplaces' in health institutions of Anuradhapura District.

The findings can be utilized to obtain an idea about the extent of implementation of the said guidelines. The same methodology can be performed at all canteens at workplaces island-wide. The findings can be used to grade the canteens, improve the standards of the canteens, and monitor their progress.

Method

This was a descriptive cross-sectional study conducted in Anuradhapura District. The canteens run within hospital premises and other medical institutions, including medical faculties were the study population. Out of these, all the canteens which provided all three main meals were selected for the study. Canteens that were under repair and owners who denied consent in participation were excluded. It was conducted from March, 2018 to February, 2019 during which all data collection and analysis were completed.

The 'Guidelines for Healthy Canteens in Work Places' published by Ministry of Health, Sri Lanka in collaboration with the WHO in 2013 was taken as the baseline reference in assessing the conditions of the observed canteens. The objective was to assess the level of implementation of the above guidelines in the selected canteens.

The 'Data Collection Form', which was an interviewer-administered format, was designed by the research team, based on the canteen guidelines, pre-tested among two canteens in the same district, which didn't fall into the study and revised and re-tested through two separate data collectors to validate the findings.

Two of the research team performed the data collection after obtaining administrative clearance from the relevant hierarchy. Dates were determined randomly, out of working days, and visited the canteens without any prior notification.

After explaining and obtaining consent, the data collectors observed the location, structure, areas of pre-cooking, cooking and serving and other facilities while also observing the food items for the main meals, snacks and beverages. They then discussed with the canteen owner/ manager and workers on relevant issues, including the awareness about the canteen guidelines and any workshops done regarding food safety and nutrition quality while examining them.

Based on the canteen guidelines, the research team designed a scoring system as there was no available system to determine the level of implementation of the canteen guidelines. Then it was submitted to a regional panel for validation. The panel consisted of one medical officer of health, one medical officer of non-communicable diseases, one medical officer in nutrition, and one medical statistician. The scoring system was revised accordingly. In par with the canteen guidelines, this scoring system accounts for the availability of different food groups, availability of a selection, proportion of healthy options, food safety measures, measures taken to improve consumer awareness about the healthiness of foods and the awareness of the canteen owners regarding the canteen guidelines. Each member of the panel allotted marks on a scale from 1 to 10. The questions which received an average of less than five were removed or revised and new questions were allowed if they identified any deficiency to evaluate the canteen guidelines. Identification of food items being 'healthy' or 'unhealthy' was based upon the description given in the canteen guidelines. The scoring on food safety measures was based on the description given on the canteen guidelines and the food safety norms practiced by the public health inspectors. This scoring system, shown in Table 1, offers more weight for the components described in detail in the canteen guidelines.

The customer type was identified as 'doctors', 'medical staff', 'medical students', and 'visitors'. The number of average customers was inquired. The final score, 'The overall level of implementation', is calculated as a mean of the 14 main components and compared among the different canteens. The median, minimum and maximum percentages were calculated from all the canteens for each of the 14 components to identify which components had more or less implementation. In addition, a number of canteens that implemented 0% and 100% of each component were also analyzed.

Results

Out of forty six canteens, ten fell under the selection criteria. Administrative clearance and consent were obtained in all of them.

The daily approximate average number of customers each canteen had is shown in Table 2. The Median was 200 and the Interquartile range was 100-625. The canteen 'MAIN' had the most number of customers (1500), while Canteen 'PADA' had the least with (40).

Seven canteens were open for all consumers, while three were restricted to medical staff only, as shown in Table 2 below.

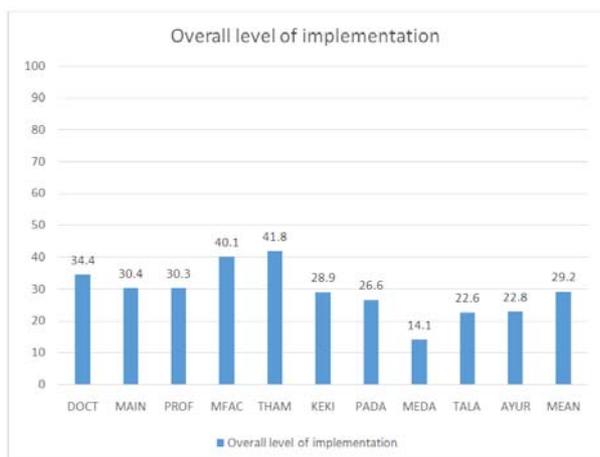
Table 1. Scoring System

SCORING SYSTEM		
Main Component (& sub-component)	Score Allocation	Maximum Score
1 Six Food Groups – availability	Percentage out of total 15	
<i>assess the availability of each Food Group according to its components considering the nutrients</i>		
Carbohydrates in all 3 main meals	presence in each meal	3
Vegetable in all 3 main meals	presence in each meal	3
Protein in all 3 main meals	presence in each meal	3
Milk as liquid/products	presence of each source	2
Oils unsaturated/saturated sources	presence of each source	2
Fruit to eat/drink	presence of each source	2
2 Healthy Carbohydrates	Percentage of $x/(x+y)$	
<i>'Carbohydrates' refers to the 1st Food Group cereals, yams, rice and flour products.</i>		
Healthy carbohydrate-based	each - 1	x
Unhealthy Carbohydrate based	each - 1	y
3 Healthy Fruit options	Percentage out of 2	
Fruits to eat	if any - 1	1
Fresh Fruit juice	if any - 1	1
4 Availability of Vegetables	Percentage out of 9	
Cooked vegetables in 3 meals	presence in each meal - 1	3
Tempered vegetables in 3 meals	presence in each meal - 1	3
Fresh vegetables in 3 meals	presence in each meal - 1	3
5 Availability of Protein options	Percentage out of 4	
Fish, Meat, Egg	each option - 1	3
Pulses	if any - 1	1
6 Healthy milk & its products	Percentage out of 2	
Liquid milk without sugar	if any - 1	1
Dairy product without sugar	if any - 1	1
7 Healthy oil options	Percentage of $p/(p+q)$	
Food with avocado, sesame, nuts	each - 1	p
All foods with added oils	each - 1	q
8 Use of standard coconut oil	0 or 100 %	
9 Other healthy options	Percentage of $t/(t+u)$	
Healthy alternatives	each - 1	t
All other alternatives	each - 1	u
10 Safe drinking water	0 or 100 %	
11 Selection of Menus	Percentage out of 9	
Carbohydrate options for each meal	>1 options in each meal - 1	3
Vegetable options for each meal	>1 options in each meal - 1	3
Protein options for each meal	>1 options in each meal - 1	3
12 Guides and Posters	Percentage out of 6	
13 Food safety measures	Percentage out of 28	
Infrastructure	each positive - 1	8
Functional activities	each positive - 1	13
Food handlers condition	each positive - 1	5
Handwashing facilities	each positive - 1	2
14 Awareness of owners	0 or 100 %	

Table 2. The daily average number of customers of each canteen, with their codes

Code	Approximate daily number	Type of customers
1 DOCT	200	Doctors, Students
2 MAIN	1500	All medical staff, Visitors
3 PROF	500	Doctors, Students
4 MFAC	1000	All medical staff, Students
5 THAM	300	All medical staff, Visitors
6 KEKI	200	All medical staff, Visitors
7 PADA	40	All medical staff, Visitors
8 MEDA	100	All medical staff, Visitors
9 TALA	100	All medical staff, Visitors
10 AYUR	100	All medical staff, Visitors

The Overall level of implementation of the canteen guidelines of each canteen was calculated using the above scoring system. As shown in Graph 1, the highest level was found with canteen 'THAM' at 41.8% followed up by 'MFAC' at 40.1%. The lowest level was found with 'MEDA' at 14.1%. The mean level of implementation was 29.2%, with five canteens falling above and below it. The overall implementation of each of the three canteens, which were restricted to medical staff, was above the mean.



Graph 1. Overall level of implementation of the guidelines by each canteen.

Out of all 14 main components, shown in Table 3, the corresponding values for the level of implementation as the median, minimum and maximum were 29.6%, 14.1% and 41.8%, respectively. 'Protein options', 'safe drinking water', 'selection of menus' and 'food safety measures' had the largest differences of over 70% between the maximum and minimum percentages of implementation.

Only 'protein options' and 'safe drinking water' had 100% implementation, among 5 and 4 canteens, respectively.

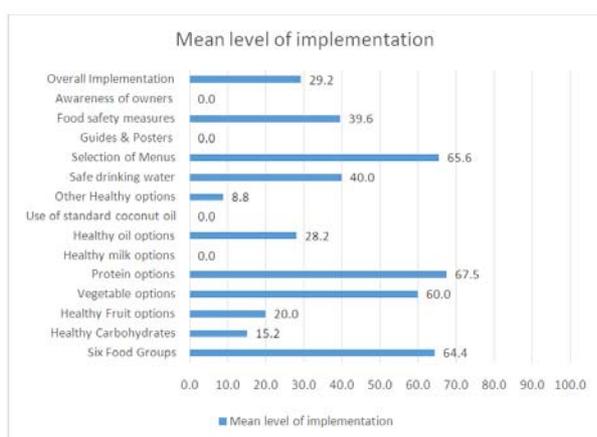
'Healthy milk options', 'Use of standard oil', 'Guides and posters' and 'Awareness of owners' were found to have zero implementation in all ten canteens. Besides them, even the maximum percentage implemented by any canteen was below 30% in 'healthy carbohydrates', 'other healthy options'.

'Healthy fruit options' and 'safe drinking water' was not available in 6 canteens each.

Only Selection of Menus, Six Food Groups, Protein options and Vegetable options had over 50% implementation but were less than 70%. Out of 14 components, nine had below 30%. Implementation of 'food safety measures' was 39.6%. Overall implementation was 29.2%, as shown in Graph 2.

Table 3. Implementation by each component

<i>Component</i>	<i>Median Percentage</i>	<i>Minimum Percentage</i>	<i>Maximum Percentage</i>	<i>No. with 0% Implementation</i>	<i>No. with 100% implementation</i>
Six Food Groups	63.9	44.4	77.8	0	0
Healthy Carbohydrates	13.9	0.0	30.0	2	0
Healthy Fruit options	0.0	0.0	50.0	6	0
Vegetable options	66.7	33.3	66.7	0	0
Protein options	75.0	0.0	100.0	1	5
Healthy milk options	0.0	0.0	0.0	10	0
Healthy oil options	33.3	0.0	50.0	2	0
Use of standard coconut oil	0.0	0.0	0.0	10	0
Other Healthy Options	5.5	0.0	29.4	2	0
Safe drinking water	0.0	0.0	100.0	6	4
Selection of Menus	72.2	11.1	88.9	0	0
Guides and Posters	0.0	0.0	0.0	10	0
Food safety measures	44.8	15.0	71.6	0	0
Awareness of owners	0.0	0.0	0.0	10	0
Overall	29.6	14.1	41.8		

**Graph 2. Mean level of implementation of each component of canteen guidelines.**

Discussion

Anuradhapura is situated in the dry zone, North Central Province of Sri Lanka. It is also the largest district in Sri Lanka, holding 10% of its population, with the 3rd largest hospital, the Teaching Hospital Anuradhapura, and 44 other hospitals, which cater to inward patients and, therefore, have resident medical staff to look after the patients [13].

Unhealthy diets are implicated as a major cause of the rising non-communicable diseases. The environment, food availability and cost also contribute to people's selection [14]. Besides NCDs, micronutrient deficiencies are also becoming common due to poor food habits [15].

Despite publishing these 'canteen guidelines at workplaces', the level of implementation has not been evaluated. There has been no publication about the improvement of the quality of food or standards in the canteen, in the least even among canteens in medical institutions. As the research team was primarily based in Anuradhapura, this study was carried out as a pilot prior to the proposed national-level study.

This study was done at all the canteens of medical institutions in Anuradhapura district, which provided all three main meals along with snacks for its employees as well as visitors. The canteen at the medical faculty was also included in the study as its customers were employees related to the health sector as academic or non-academic, in addition to the medical trainees. The canteens MFAC, DOCT, and PROF, were restricted to medical staff/ trainees only. These canteens are the closest, most available, and perhaps most affordable food selection for these people. Therefore the available food items at these canteens invariably become the predominant choice of food for these people.

Although the initial plan was to train two medical undergraduates for data collection, it could not be implemented due to circumstantial reasons. Therefore, two of the research team performed the data collection. When conducting this study at the national level, recruiting and training data collectors independent from the research team is advisable.

Out of all 46 medical institutions of Anuradhapura District, only ten were found to provide all three main meals.

Unfortunately, no other published records were evaluating the canteen guidelines. Few undergraduate surveys discussed customer satisfaction. Adherence to basic food safety measures was studied in schools in Western Province, which revealed majority had deficiencies [16]. No published articles were describing the nutritional qualities of food provided in canteens.

Considering the overall implementation of individual canteens, none had even 50%, which was highly unsatisfactory. Canteens 'THAM' at 41.8% and 'MFAC' at 40.1% had the highest overall implementation. 'THAM' caters to both medical staff and visitors, but 'MFAC' is restricted to its staff and students. Other canteens above the mean of 29.2% were 'DOCT' at 34.4%, 'MAIN' at 30.4%, and 'PROF' at 30.3%, which again show no common customer type. It shows that, even in canteens restricted to doctors, staff and students do not show a satisfactory level of implementation, although each of them is slightly above the mean level of implementation. The canteen 'MEDA' with the least level of implementation (14.1%) also serves food for medical staff.

The general Sri Lankan diet has a significant deficiency in protein and vegetable consumption [17,18]. The general micronutrient adequacy is in doubt overseeing the rates of micronutrient deficiencies identified in surveys conducted in selected groups [19,20]. The canteen guidelines have described on providing these options from the canteen meals through 'healthy food options' rich in proteins, micronutrients, and fiber. Therefore, attempting to adhere to the canteen guidelines may offer some solution to this dietary deficiency.

When assessing the 'healthy options' on Carbohydrates (15.2%), Fruits (20%), Milk (0%), Fats (28.2%) and other snack options (8.8%) the level of implementation is far below acceptable. The healthiness of the above food categories was determined according to the canteen guidelines. However, deciding whether a food item is healthy or not is subjective upon the criteria considered. A canteen that provides food items containing a minimal amount of nuts, sesame, or pulses in its food options may get a higher score compared to a canteen that provides a single food item but filled with a larger portion of nuts or

sesame or pulses. Also, when general fruit consumption is well below recommendation, a canteen which does not provide fruits in a 'healthy' manner but has several fruits may score lower than a canteen with just one fruit option [7].

The use of standard oil for cooking was not practiced in any of the canteens, although most canteen tenders have specifically mentioned doing so. Currently, Coconut oil is considered the safest for cooking purposes as Sri Lankan culinary practice predominates heating oils to higher temperatures than recommended for tempering when using other vegetable oils [21,22].

The provision of safe drinking water is considered an essential component in any food outlet. However, only 4 out of 10 canteens provided this.

Food safety is supposed to be closely monitored by the Public Health Inspectors according to the food act. But the level of food safety measures followed among ten canteens was merely 40% raising questions on negligence on the part of medical staff and food authorities. Availability of soap and water was included within this component, and it was found that some canteens did not have such facilities although they provided an 'eating area'. This should be considered a severe deficiency.

None of the canteens had any 'guides and posters' of any form to raise the customers' awareness. Also, none of the canteen owners declared that they were aware of the 'canteen guidelines'. None of them had participated in any awareness activities regarding food safety or nutrition. This is an impressive finding because all these canteens were in medical institutions and providing food primarily to medical staff. Yet, there has been no declared attempt to raise the awareness of either the customer or the food provider.

This study had several limitations. The scoring system should preferably be re-validated through a national expert panel to minimize potential bias further. Identification of a food item as healthy has its practical issues. A national-level study through random sampling would provide a broader picture of the implementation of the canteen guidelines.

Conclusion

The level of implementing the canteen guidelines was unsatisfactory. Health institutes do not appear to provide or demand healthy food or food safety measures as expected. The objectives of preparing the guidelines for the healthy canteen in workplaces have not reached the canteens nor its customers in Anuradhapura District. This highlights the need for a monitoring mechanism when publishing guidelines.

List of Tables/ Graphs

Table 1: Scoring system - short illustration

Table 2: The daily average number of customers of each canteen, with their codes.

Table 3: Implementation by each component.

Graph 1: Overall level of implementation of the guidelines, by each canteen.

Graph 2: Mean level of implementation of each component of canteen guidelines

Ethics approval

Ethical approval obtained from the Ethics Review Committee, Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka.

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Conflicts of interest

All authors declare to have no conflicts of interest.

Author contributions

While all authors were involved in all stages of the research, specific contributions were made as followed. APA and SKA handled research proposal, data collection, analysis and manuscript. ABP conceptualized the research. RJ edited the research proposal and the manuscript. JNW contributed to the analysis and editing of the manuscript.

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