



NUTRITIONAL REQUIREMENTS IN COVID-19 HEALTH CARE WORKERS – DO WE CATER?

Community Medicine

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ABSTRACT

Background: Health Care Workers (HCWs) involved in COVID-19 patients management while wearing PPEs, face physiological challenges. Maintaining optimal nutrition is crucial for supporting their immune system. Present study was planned to assess nutritional requirements in HCWs. **Methods:** A cross-sectional analytical study was carried out on HCWs with the experience of wearing PPE during management of COVID-19 patients. Data was collected online through a self-administered semi-structured pilot tested questionnaire using WhatsApp messages and emails. **Results:** 211 (88.3%) of study participants were clinicians, 24 (10%) administrative staff and 4 (1.7%) nursing staff. 71 (29.7%) felt hungry and two-thirds 188 (78.7%) felt stressed while wearing PPE. Nearly half (125; 52.3%) had an inclination to consume energy dense food items like chocolates/protein bars and (96; 40.2%) felt the need to consume extra diet. **Conclusion:** HCWs involved in COVID-19 patient management need energy dense foods and prefer liquid diet to alleviate various symptoms experienced while wearing PPE.

KEYWORDS

COVID-19, Health care workers, Nutrition

INTRODUCTION

Health Care Workers (HCWs) such as doctors, nurses, para-medics, housekeeping and other individuals involved directly in care and management of COVID-19 patients, are the first line responders during the pandemic. Being in direct contact with COVID-19 affected individuals, HCWs are at the highest risk of being exposed [1]. These workers are also at risk of being exposed to various occupational hazards such as psychological stress, emotional pressure and increased nutritional requirements [2-5]. This is because of long working hours requiring continuous shift of around 12 hours wearing of Personal Protective Equipment (PPE), staying away from home and families to prevent spread of infection in the community, alternate day duties, worry about their kith and kin, fear of contracting infection, inconvenience of wearing of diapers during duty hours etc. Mental and social pressures in HCWs had resulted in long term psychological and occupational effects during MERS and SARS outbreaks in past [6-7]. The same situation has surfaced again in an exponential form during the present times of global COVID-19 infection.

Working in such conditions of extreme stress results in high Basal Metabolic Rate, altered taste, appetite fluctuations, disturbed sleep and creates greater physiological demands.

To mitigate this stress, maintain health and fitness and to keep up high morale of HCWs, nutritional status is a critical component. COVID-19 HCWs are not able to consume heavy meals before long working hours as it creates a bloating sensation while wearing PPE. So, there is a requirement of intake of energy dense and protein rich snacks prior to duty shift for maintaining continuous energy supply. In addition, requirement of excess of proteins along with micronutrients as Vitamin B/A/C/E should be met.

There is paucity of studies that have assessed nutritional requirements in HCWs involved in COVID-19 patients management. Present study was hence planned to assess nutritional requirements in HCWs involved in management of COVID-19 patients while wearing PPEs.

METHODS

An online cross-sectional analytical study was carried out on HCWs involved in management of COVID-19 patients from May 2022 to Jul 2022. A structured questionnaire was prepared to assess nutritional requirements faced by HCWs while wearing PPE. This was pilot tested on twenty study participants and reviewed. Responses of pilot study

were not included in main study. Questionnaire was shared with participants using WhatsApp message, emails and personal contact. Consent was taken from participants and confidentiality of data was maintained. Sample size was calculated using formula assuming 50% of study participants have increased nutritional needs with precision of 5% and error of margin as 10%. Total sample size was calculated to be 196. However, total sample size taken for the study was 239. Snowball sampling strategy was used to include study participants. Statistical analysis was done using SPSS version 20.0 Armonk, NY: IBM Corp. Each variable was defined and numbers and percentages were calculated. Comparison of proportions was calculated using z test.

RESULTS

A total of 239 responses were received and results were analysed. Age and gender wise distribution of study participants is given in Table 1.

Table 1: Age And Gender Wise Distribution Of HCWs (n=239)

Age (in years)	Males n (%)	Females n (%)	Total n (%)
20-29	9 (52.9)	8 (47.1)	17 (7.1)
30-39	22 (21.4)	81 (78.6)	103 (43.1)
40-49	19 (23.5)	62 (76.5)	81 (33.9)
50-59	12 (34.3)	23 (65.7)	35 (14.6)
>60	1 (33.3)	2 (66.7)	3 (1.3)
Total n (%)	63 (26.4)	176 (73.6)	239 (100.0)

63 (26.4%) study participants were males and 176 (73.6%) females. Majority (211; 88.3%) were clinicians, 24 (10%) managerial/administrative staff and 4 (1.7%) nursing staff. 183 (76.6%) were working in Government sector, 53 (22.2%) in private sector and 3 (1.2%) in semi-government organisation. Majority (210; 87.9%) always used PPEs while managing COVID-19 patients and 29 (12.1%) used it sometimes. Few study participants (45; 18.8%) used general use non COVID area PPE with surgical gown/N-95 mask/goggles/gloves; 160 (66.9%) used coverall based PPE kit with coverall/hood/N-95 mask/goggles/gloves/long shoe covers and 34 (14.2%) used Tyvek/Tychem/Kimberley Clark A 30 coverall based PPE kit with coverall/N-95 mask/goggles/gloves/long shoe covers.

While wearing PPE, more than half participants experienced dehydration (151; 63.2%) due to excessive sweating, breathlessness (114; 47.7%) due to usage of facial masks, giddiness (78; 32.6%), claustrophobia (72; 30.1%) and blurred vision (4; 1.7%) due to fogging (Fig 1).

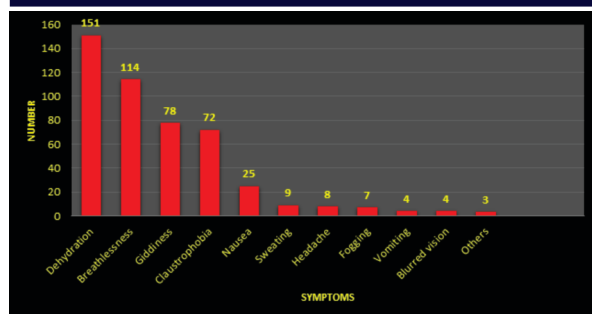


Fig. 1: Worst experiences among HCWs while wearing PPEs (n=239)

Proportion of study participants with giddiness and claustrophobia was significantly more in cases where duration of wearing PPE was more than 4 hours ($p < 0.05$) (Table 2).

Table 2: Symptom Wise Distribution And Longest Duration Of Wearing PPE (n=239)

Longest duration of wearing PPE (in hours)	Dehydration n(%)	Breathlessness n(%)	Giddiness n(%)	Claustrophobia n(%)
<4 h (n=124)	72 (58.0)	52 (41.9)	33 (26.6)	41 (33.0)
>4 h (n=115)	79 (68.6)	62 (53.9)	45 (39.1)	103 (89.5)
p	0.09	0.06	0.03	<0.0001

Before donning PPE, 201 (84.1%) study participants prepared themselves by drinking water, 37 (15.5%) consumed liquid diet, 33 (13.8%) fruits, 66 (27.6%) solids and 57 (23.8%) milk. After doffing, 169 (70.7%) preferred consuming liquid diet, 40 (16.7%) solid food and 30 (12.6%) did not feel like eating / drinking (Fig 2).

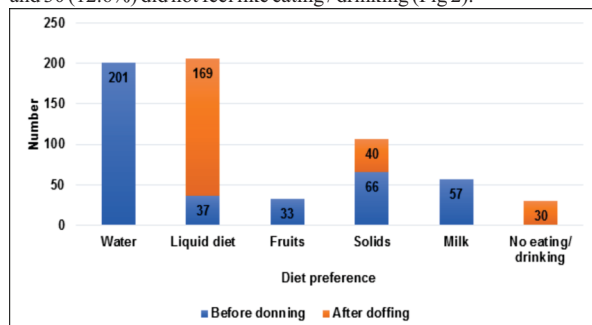


Fig. 2: Preferred diet consumption by HCWs before donning and after doffing PPE (n=239)

Unquantifiable weight loss was reported by 97 (40.6%) HCWs during COVID-19 duty tenure. One-third study participants 71 (29.7%) felt hungry and two-thirds 188 (78.7%) felt stressed while wearing PPE. There was a felt need among (96; 40.2%) HCWs to consume extra diet and half of them (125; 52.3%) had an inclination to consume energy dense food items like chocolates/protein bars. About 83 (34.7%) study participants took some form of health supplements on their own during COVID-19 duty tenure to cater for their felt nutritional deficiencies.

DISCUSSION

Management of COVID-19 patients and wearing of PPEs by the HCWs while working in HDU/ICU settings, is an extremely stressful situation and creates greater physiologic demands [8]. It is a known phenomenon that wearing of PPEs lead to elevated carbon di-oxide levels in the blood, hyperventilation and low blood sugar levels. Moreover, to ensure judicious and cost-effective use of PPEs, HCWs are required to wear PPEs for prolonged duration ranging from 8 to 12 hours especially in resource constrained settings [9]. This also in turn has an adverse impact on performance efficiency of HCWs. There is hence a requirement of providing nutrients to HCWs through nutritionally dense diet, foods which delay hunger reflux by stabilising blood sugar levels, assist in growth and tissue repair, curb levels of stress hormones while strengthening immune system and also help in recovering from stressful event quickly.

The stressful effects of wearing PPEs in HCWs can be alleviated by nutritional interventions such as by providing extra nutrients preferable energy dense items to HCWs wearing PPEs and working in HDU/ICU settings. These food items will not only meet their additional body requirements but will also boost up their morale to cope up with the stressful environment and may in turn improve their work efficiency [10]. This may be implemented by setting up a refreshment area in hospitals adjacent to donning and doffing site or at an easily accessible and convenient location. Guidelines for prevention of transmission of COVID-19 infection should be strictly adhered to while visiting these areas. Food Safety and Standards Authority of India (FSSAI) guidelines should be followed in preparation/transport and serving of food items. Microwave/ food warmers/refrigerators to keep hot things hot and cold items cold, should be provided. Water dispenser with hot and cold water should be available. Hot and cold drinks such as soup, milk shakes, fresh fruit juices and coconut water vending machine should be installed. Area should be well lit and a light soothing music in the background can be installed to alleviate mental stress of staff and create an ambience of wellbeing. Menu planning should be done based on food preferences of workers, availability of food items, cultural practices and market availability of seasonal fruits and vegetables. Items should be ready to eat, using straw for sucking in liquid food and involve minimum handling by HCWs to avoid contamination.

Sample menu with macronutrient composition has been prepared with the rationale that included food items should combat extreme conditions of physical and mental stress by providing adequate nutrient intake as well as delay hunger reflux without causing bloating (Table 3).

Table 3: Sample Menu

Items	Food preparations
Hot food snacks	Paneer fritters, Vadas, Chicken/vegetable cutlets, Boiled eggs, Cheese rolls
Cold snacks	Chicken/Veg/Cheese sandwiches, Ready plates with cut fruits
Drinks	Cold coffee, Mango shake, Flavoured milk, Tetra juices, Lime/ coconut water
Miscellaneous	Chocolates, Eclairs, Nuts, Herbal tea or green tea sachets

These suggestions can be used to plan nutritional interventions and study impact on reduction of stress levels and improvement in efficiency of HCWs.

CONCLUSION

This article has highlighted an important aspect that about 84.1% HCWs working in COVID-19 health care settings prepare themselves by drinking water before donning PPE and 70.7% preferred liquid diet after doffing. While wearing PPE, 78.7% study participants felt stressed and 29.7% felt hungry. A felt need was present among HCWs while wearing PPE to consume extra diet and to consume energy dense food items.

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