

## Health & Research Journal

Vol 6, No 1 (2020)

Volume 6 Issue 1 January - March 2020



Volume 6 issue 1 January-March 2020

### EDITORIAL

"Shadowing a nurse" technique

### REVIEW

Post stroke depression and its effects on functional rehabilitation of patients: socio-cultural disability communities

### SPECIAL ARTICLES

The impact of mediterranean diet in perioperative nurses' health

### RESEARCH ARTICLES

Complementary and alternative medicines used by cancer patients to cope with nausea

Musculoskeletal pain management in the Emergency Department

Published in cooperation with the Postgraduate Program "Intensive Care Units", the Hellenic Society of Nursing Research and Education and the Helerga

### The impact of mediterranean diet in perioperative nurses' health

*Sofia Agriopoulou, Ioannis Koutelekos*

doi: [10.12681/healthresj.22513](https://doi.org/10.12681/healthresj.22513)

### To cite this article:

Agriopoulou, S., & Koutelekos, I. (2020). The impact of mediterranean diet in perioperative nurses' health. *Health & Research Journal*, 6(1), 21-28. <https://doi.org/10.12681/healthresj.22513>

## SPECIAL ARTICLE

## THE IMPACT OF MEDITERRANEAN DIET IN PERIOPERATIVE NURSES' HEALTH

**Sofia Agriopoulou<sup>1</sup>, Ioannis Koutelekos<sup>2</sup>**

1. Lecturer, MSc, PhD, Department of Food Science and Technology, University of the Peloponnese, Greece

2. Assistant Professor, RN, MSc, PhD, Nursing Department, University of West Attica, Greece

DOI:

**Abstract**

Perioperative nurses are involved in the care of surgery patients, in a highly stressful environment with various risks. Unrealistic schedules and long working hours standing, and working shifts, make them more vulnerable to potential risks. Their health is affected by the quality of the work environment. Problems that may arise from the highly stressful work involve chronic stress, burnout, dissatisfaction, obesity and sleeping disorders. Nutritional problems result from the lack of time between shifts for food preparation, the extended time without food or liquid, reduced hydration, the irregular hours and times to eat, the less substantial meals and more caloric snacks. Mediterranean diet is a scientifically proven healthy diet, indicated for fighting obesity, heart disease and cancer. The consumption of fruit, vegetables, grains, nuts, and olive oil in the framework of Mediterranean diet which is rich in beneficial nutrients, could significantly improve perioperative nurses' quality life, and their eating habits.

**Key words:** Perioperative Nurses, Healthy Eating, Obesity, Mediterranean Diet, Nutrition

**Corresponding Author:** Sofia Agriopoulou, Department of Food Science and Technology, Antikalamos Messinia, 24100, University of the Peloponnese, Contact telephone: 00306978653778, e-mail: [sagriopoulou@gmail.com](mailto:sagriopoulou@gmail.com)

Cite as: Agriopoulou, S., Koutelekos, I. (2020). The impact of Mediterranean diet in perioperative nurses' health. *Health and Research Journal*, 6(1), 21-28. <https://ejournals.epublishing.ekt.gr/index.php/HealthResJ>

## INTRODUCTION

Perioperative nurses function in various roles, including those of managers, clinical practitioners (e.g., scrub nurse, circulating nurse, and clinical nurse specialist), instructors and researchers. Furthermore, perioperative nurses are responsible for the perioperative patient assessment, patient and family teaching, patient and family support and reassurance, patient advocacy, control of the operating room environment, efficient provision of resources, coordination of activities related to surgical patient care, communication, collaboration and consultation with other healthcare team members. Moreover, perioperative nurses must be responsible for the maintenance of aseptic and sterile techniques, on-going monitoring of the patients' physiological and psychological status, supervision of patients care assistant, management of equipment, instruments, supplies and mediate between various hospitals, departments, the surgeons, and the management.<sup>1</sup> The health and well-being of working people and their families are greatly influenced by the quality of their work environments, whether resulting directly from exposures to physical hazards on the job and risks associated with the organizational context, or indirectly through the impact of work on health behaviours.<sup>2</sup> The complexity of the perioperative environment is growing because of an increased use of technology in the setting of institutional production pressures.<sup>3</sup> Operating room environment is generally an isolated, closed, restricted, environment, which requires a coordinated and well-directed group effort, with many risks for the patient and the surgical team that should be carefully devoted at all levels.<sup>4</sup> Each year, more than 234 million surgical procedures are performed globally.<sup>5</sup> Perioperative nurses should be prepared for the execution of these procedures, in a workplace where accidents can happen. Perioperative nurses face every day, many categories of hazards and risks such as accidental, chemical, biological, ergonomic, psychosocial, physical, and organizational hazards, and all of them could possibly influence and threaten perioperative nurses physical and psychological health and wellness in different degrees.<sup>1</sup>

The operating room environment is the most important among the other departments of a hospital and it's because in this place, daily surgical operations of patients are performed. The

nature of surgeries makes nurses to acquire special characters in order to be able to respond to fast and changeable rhythms with high intensity. Furthermore, with the rapid development of medical science, and technology, perioperative nurses must be well-educated, not only in the basic nursing care, but they need to have engineering and technical skills.<sup>6</sup> Generally, healthcare workers are required to work shifts, as the government, private hospitals and nursing homes usually operate 24 hours a day. One third of those people are estimated to work shifts, across Europe.<sup>5</sup> Perioperative nurses work in shifts, as they are forced to work with a different time schedule, depending on the hospital's needs.

Multiple health problems are associated with shift work, including increased risk of a range of cardiovascular diseases and metabolic disorders). It is noteworthy that some of these disorders, may be linked to the quality of the diet and irregular time of eating.<sup>7</sup> Some studies have shown that there is a greater incidence of obesity amongst shift workers, and that shift work may be associated with higher risk of insulin resistance, diabetes, dyslipidemias and even possibly increased incidence of cancer.<sup>8,9</sup>

Understanding the aetiology of shift work-related morbidity is complex due to diverse contributory factors such as sleep disturbance, altered social pressure and patterns of food intake.<sup>10</sup> For example, although shift workers often report normal total energy intake, there is commonly an altered temporal distribution of feeding characterised by more irregular eating times, more snacking and fewer substantial meals.<sup>7</sup>

Nutrition plays a major role in influencing personal health and ideal weight.<sup>11</sup> Evidence suggests that many nurses are engaged in unhealthy 'lifestyle' behaviours and have relatively poor health.<sup>12</sup> Studies on Mediterranean diet (MedDiet) over the past 50 years, have shown a substantial beneficial effect of keeping this diet for human health. Strong evidence has been reported about its association with the reduced risk of cardiovascular disease.<sup>13</sup> This article provides an overview of all the beneficial nutritional habits of the Mediterranean diet in the perioperative nurses' health.

### The paradox with perioperative nurses' nutritional habits

Healthy eating behaviors for nurses, with the instructions given by Lowden et al.<sup>7</sup> include: (i) the time and frequency nutrition (ii) meal composition (iii) food composition (iv) the usual average intake of energy and essential non energy efficiency nutrients (Table 1).

Fatigue and chronic muscular-skeletal pain due to the handling of heavy patients and to longer periods of work in a standing posture, psychological stress caused by a feeling of heavy responsibility towards patients, stress, strained family relations, and burnout due to shift and night work, overtime work, and contact with sick patients, especially when patients do not recover from the operation, problems of interpersonal relations with surgeons and other members of the operating team, are some ergonomic and psychosocial hazards, faced by perioperative nurses in their workplace.<sup>1</sup> Many time perioperative nurses consume sweets that patients' families bring, as a token of appreciation for the care received by patients, without any real sense of hunger. Long duration surgical protocols, without any intermediate rest, irregular hours and times for lunch, more snacking, less substantial meals, lack of time between shifts for preparing meals, extended time without food or liquids can lead to lower blood glucose levels, reduced hydration, irritability and tiredness, very common to the perioperative nurses.<sup>11</sup>

Perioperative nurses must provide patients with nutritional education in the hospital setting, and although perioperative nurses are aware of the importance of activities that promote health, often make unhealthy lifestyle choices. Actually, they are knowledgeable of the importance of healthy eating, of physical activity, of stress management, of sleep hygiene and maintaining healthy relationships. Shift work, overload work, stressful working conditions, long working hours, are common reasons for nurses, to develop unhealthy behaviours. The problems that arise for perioperative nurses is chronic stress, burnout, dissatisfaction, obesity, and sleeping disorders.<sup>14</sup>

### **Healthy habits of Perioperative Nurses through the Mediterranean diet**

Diet can be an important factor affecting mainly the body weight. A particular food consumption pattern in about 16 countries bordering the Mediterranean Sea, described as Medi-

terranean diet. The dietary patterns in these countries actually vary nowadays. Even in the same country, the dietary patterns may also be different.<sup>15</sup> It is worthy to note that, in Greece, Crete's diet, referred as traditional MedDiet, confers the Crete people the best health status and the lowest morbidity and mortality rates from cancers among populations around the Mediterranean regions.<sup>16</sup> Briefly, MedDiet diet features include high intake of vegetables, fruits, grains (mainly unrefined), nuts, high intake of olive oil but a low intake of saturated lipids, moderate to high intake of fish and poultry, low intake of red meat, low consumption of dairy products, low intake of eggs and sweets, moderate consumption of wine with meals, drinking enough water daily, and daily physical exercise.<sup>17,18</sup> The maintenance of MedDiet has shown through studies the health benefits such as reduced overall mortality, reduced incidence of chronic diseases, particularly serious cardiovascular diseases, as well as the increased likelihood of healthy aging.<sup>19,20,21</sup>

Given that, perioperative nurses work in shifts, with high risk of obesity, and increased incidence of cancer, MedDiet, it could be a very good dietary approach. According to the World Health Organization (WHO), 59% of the population in European Region is overweight or obese and Greece has been identified as the country with very high rates of overweight and obesity in Europe.<sup>22</sup> Specifically in 2014, 67.4 of men and 58.4 of women were classified as being overweight in Greece.<sup>23</sup> Body Mass Index (BMI) is an indicator for body weight status, which is calculated by dividing weight in kilograms by the square of height in meters, according to the formula (kg/m<sup>2</sup>). A high BMI can be an indicator of high body fatness. If the BMI is 25.0 to <30, it falls within the overweight range, and if the BMI is 30.0 or higher, it falls within the obese range.<sup>24</sup> Worldwide, overweight rates among nurses measured by body mass index have ranged from 18-53%, and rates of obesity from 7.4% to 28%. Factors contributing to obesity are highly complex and multifactorial, but at the simplest level, obesity is due to an increased consumption of high calorific foods without an equal increase in physical activity.<sup>25</sup> There are many dietary factors in traditional MedDiet, that except for reducing cancer risk and ameliorate the risk of obesity are effective in reducing the weight gain. The dietary explanation for the antiobesity effect

of traditional MedDiet is based on the high consumption of plant-based food that provides a large quantity of fiber, low energy density and low glycemic load.<sup>26</sup>

Many foods or dietary factors, might have anticancer properties in the MedDiet. Among all dietary factors, polyphenols gain the greatest attraction. Polyphenols are commonly found in fruit such as grapes, strawberries, citrus fruit, vegetables such as onions, whole grains such as cereals, bread, and rye, fat such as olive oil and beverage such as tea and red wine. The main groups of polyphenols are flavonoids, phenolic acids, phenolic alcohol, stilbenes, and lignans. All phenolic groups have antioxidant properties because of their chemical structures.<sup>27</sup> Moreover, the fibers present in whole-grain food and vegetables significantly decrease the risk of many cancers.<sup>28</sup> Another group of dietary factors in traditional MedDiet with reported anticancer effect is antioxidants. Specifically, there are more than 500 carotenoids, found in all yellow-orange-red fruit and vegetables, and MedDiet is rich in alpha- and beta-carotene, beta-cryptoxanthine, vitamin C, vitamin A, vitamin E, and lycopene.<sup>29</sup> Additionally, dietary antioxidants in traditional MedDiet will also help to reduce risk of obesity.<sup>30</sup>

Another important characteristic of MedDiet, is that olive oil is the main fat source. Virgin olive oil contains a high percentage of monounsaturated fatty acids (MUFAs), mainly contains oleic acid, which represents 70-80% of the fatty acids present in virgin olive oil and healthy properties are due to this.<sup>31</sup> Many studies showed that oleic acid play an important role in cancer prevention.<sup>32,33</sup> Moreover, the olive oil phenolic components, which mainly consists of oleuropein, hydroxytyrosol, and tyrosol act as natural antioxidants, and in preclinical studies against cardiovascular and metabolic disorders a protective action has been demonstrated.<sup>34,35</sup> Polyphenols derived from olives and olive oil has been associated with inflammation and blood lipids.<sup>36</sup>

The Mediterranean diet includes medium consumption of wine with meals, meaning one drink (5 oz) per day for women and two for men. Actually, red wine is rich in phenolic compound which exert antioxidant actions.<sup>15,37</sup> Resveratrol and piceatannol are very important naturally occurring polyphenolic substances, present in grapes and wine. Both of them have long

been suspected to exhibit a wide spectrum of biological activities of medicinal interest such as anticancer, anti-oxidative, anti-diabetic, anti-aging and anti-inflammatory activities.<sup>38</sup> Experimental study shows that piceatannol has cytotoxic effect on hepatoma implying its protective role in liver cancer.<sup>39</sup> Recently, it has been reported that resveratrol is a potential anti-obesity compound, directly affecting lipolysis and glucose transport in human fat cells.<sup>40</sup>

Water is the main component of the human body, representing about 60% of body weight in male adult, 50 to 55% in adult female and up to 75% in infants.<sup>41</sup> European Food Safety Authority (EFSA) has expressed its scientific opinion on dietary reference values for water. Adequate total daily water intakes for men and women were defined as 2.5 litres and 2.0 litres, respectively.<sup>42</sup> Human dehydration contributes to morbidity in several chronic diseases and affects health, wellness and performance.<sup>41</sup> Part of a balanced diet is sufficient water intake because, apart from its importance for physical performance and mental function, there is evidence that associates the appropriate state of hydration with range of health benefits, including fatal coronary heart disease. Given that there is a great variety of food and beverage sources in the Mediterranean diet containing more than 85% water, such as fruit and vegetables, fresh natural juices from fruit and vegetable, tea and milk, becomes evident once again the considerable benefits of this diet on overall healthy eating.

## CONCLUSIONS

1. The Mediterranean diet is a scientifically proven healthy diet. The results come with a holistic dietary approach, where there is not a "magic" ingredient, but there are the whole, rather than individual nutrients.
2. The motivation to change and maintain habits to improve nutrition may initially be a challenge for perioperative nurses, but it is possible when set as a goal.
3. Daily focus on planning, preparation and utilization of existing knowledge about the Mediterranean diet will help perioperative nurses to significantly improve the dietary habits. Also, by improving their health, perioperative nurses can improve their lives and provide better care for their patients.

## REFERENCES

1. Danjuma A, Babatunde AAL, Taiwo OA, Micheal S. N. Rates and Patterns of Operating Room Hazards among Nigerian Perioperative Nurses. *Journal of Perioperative and Critical Intensive Care Nursing*. 2016; 2(1).
2. NIOSH Research Compendium: The NIOSH Total Worker Health TM Program: Seminal Research Papers 2012. Washington, DC: U.S. Department of Health and Human Services, Public Health Service, Centres for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH). 2012; p. 1-214.
3. Christian CK., Gustafson ML, Roth EM., Sheridan TB, Gandhi TK, Dwyer K. et al. A prospective study of patient safety in the operating room. *Surgery*, 2006; 139(2): p.159-173.
4. Phillips N. 2004. *Berry and Kohn's Operating Room Technique*. (10th edn), St. Louis: Mosby.
5. Eurofound (2005) "Fourth Working Conditions Survey". Retrieved from <http://www.eurofound.europa.eu/ewco/surveys/ewcs2005/index>.
6. Huang J. Progress in the Research of Operating Room Nurses' Psychological Resilience. *Journal of Qilu Nursing*. 2010; 16: p.53-55.
7. Lowden, A., Moreno, C., Holmbäck, U., Lennernäs, M., & Tucker, P. Eating and shift work -effects on habits, metabolism and performance. *Scandinavian Journal of Work Environment & Health*. 2010; 36(2): p.150-162.
8. Seychell J, Reeves S. The effect of shift work on the diet of accident and emergency nurses at a general hospital in Malta. *Nutrition & Food Science*. 2017; 47(2): p.165-174.
9. Lieu SJ, Curhan GC, Schernhammer ES, Forman JP. Rotating night shift work and disparate hypertension risk in African-Americans. *Journal of Hypertension*. 2012 January; 30(1): p.61-66.
10. Esquirol Y, Bongard V, Mabile L, Jonnier B, Soulat JM, Perret B. Shift work and metabolic syndrome: respective impacts of job strain, physical activity, and dietary rhythms. *Chronobiology International*. 2009 April; 26: p. 544-559.
11. Criscitelli T. Influencing Optimum Health for Nurses. *AORN Journal*. 2017; 105: p. 228-231
12. Perry L, Gallagher R, Duffield C. The health and health behaviours of Australian metropolitan nurses: an exploratory study. *BMC Nursing*. 2015 September; 14.
13. Grosso G, Marventano S, Yang J, Micek A, Pajak A, Scalfi L, et al. A comprehensive meta-analysis on evidence of Mediterranean diet and cardiovascular disease: are individual components equal? *Critical Reviews in Food Science and Nutrition*. 2017 October; 57: p. 3218-3232.
14. Ross A, Bevans M, Brooks AT, Gibbons S, Wallen GR. Nurses and Health-Promoting Behaviors: Knowledge May Not Translate Into Self-Care. *AORN Journal*. 2017 March; 105(3): p. 267-275.
15. Kwan HY, Chao X, Su T, Fu X, Tse AKW, Fong WF, et al. The anticancer and antiobesity effects of Mediterranean diet. *Critical Reviews in Food Science and Nutrition*. 2017 January; 57(1): p. 82-94.
16. Kafatos A, Verhagen H, Moschandreas J, Apostolaki I, Van Westerop JJM. (Mediterranean diet of Crete: Food and nutrient content *Journal of The American Dietetic Association*. 2000 December; 100(12): p. 1487-1493.
17. Davis C, Bryan J, Hodgson, J, Murphy K. Definition of the Mediterranean Diet: A Literature Review. *Nutrients*. 2015 November; 7(11): p. 9139-9153.
18. Crous-Bou M, Fung TT, Prescott J, Julin B, Du M, Sun Q, et al. Mediterranean diet and telomere length in Nurses' Health Study: population based cohort study. *BMJ*. 2014 December; 349:g6674.
19. Fung TT, Rexrode KM, Mantzoros CS, Manson JE, Willett WC, Hu FB. Mediterranean diet and incidence of and mortality from coronary heart disease and stroke in women. *Circulation*. 2009 March; 119(8): p. 1093-1100.
20. Lopez-Garcia E, Rodriguez-Artalejo F, Li TY, Fung TT, Li S, Willett WC, et al. The Mediterranean-style dietary pattern and mortality among men and women with cardiovascular disease. *The American Journal of Clinical Nutrition*. 2014 January; 99(1): p. 172-180.
21. Estruch R, Ros, E, Salas-Salvado J, Covas, MI, Corella D, Aros F, et al. Primary prevention of cardiovascular disease

- with a Mediterranean diet. *The New England Journal of Medicine*. 2013 April; 368(14): p. 1279-1290.
22. World Health Organisation. (2015). The European health report 2015. Targets and beyond—Reaching new frontiers in evidence. Retrieved from <http://www.euro.who.int/en/data-and-evidence/european-health-report/european-health-report-2015/european-health-report-2015-the-targets-and-beyond-reaching-new-frontiers-in-evidence-highlights>.
23. World Health Organisation. (2014). Global status report on noncommunicable diseases. Retrieved from <http://www.who.int/nmh/publications/ncd-status-report-2014/en/>.
24. Centers for Disease Control and Prevention. 2016. Defining adult overweight and obesity. Retrieved from <https://www.cdc.gov/obesity/adult/defining.html>.
25. Nicholls R, Perry L, Duffield C, Gallagher R, Pierce H. Barriers and facilitators to healthy eating for nurses in the workplace: an integrative review. *Journal of Advanced Nursing*. 2017 May; 73(5): p. 1051–1065.
26. Willett WC, Leibel RL. Dietary fat is not a major determinant of body fat. *American Journal of Medicine*. 2002 December; 113: (Suppl 9B):47S–59S.
27. Le Marchand L, Murphy SP, Hankin JH, Wilkens LR, Kolonel LN. Intake of flavonoids and lung cancer. *Journal of the National Cancer Institute*. 2000 January; 92(20): p. 154–160.
28. Bradury KE, Appleby PN, Key TJ. Fruit, vegetable, and fiber intake in relation to cancer risk: findings from the European Prospective Investigation into Cancer and Nutrition (EPIC). *The American Journal of Clinical Nutrition*. 2014 July; 100: 394S-8S.
29. Gerber M. Biofactors in the Mediterranean diet. *Clinical Chemistry and Laboratory Medicine*. 2003 August; 41(8): p. 999–1004.
30. O’Keefe JH, Abuannadi M. Dietary strategies for the prevention & treatment of metabolic syndrome. *Missouri Medicine*. 2010 Nov-Dec; 107(6): p. 406–409.
31. Tripoli E, Giammanco M, Tabacchi G, Di Majo D, Giammanco S, La Guardia M. The phenolic compounds of olive oil: structure, biological activity and beneficial effects on human health. *Nutrition Research Reviews*. 2005 June; 18(1): p. 98–112.
32. Owen RW, Haubner R, Würtele G, Hull E, Spiegelhalder B, Bartsch H. Olives and olive oil in cancer prevention. *European Journal of Cancer Prevention*. 2004 August; 13(4): p. 319–326.
33. Waterman E, Lockwood B. Active components and clinical applications of olive oil. *Alternative medicine review*. 2007 December; 12(4): p. 331–342.
34. Bulotta S, Celano M, Lepore SM, Montalcini T, Pujia A, Russo D. Beneficial effects of the olive oil phenolic components oleuropein and hydroxytyrosol: focus on protection against cardiovascular and metabolic diseases. *Journal of Translational Medicine*. 2014 August; 12: 219.
35. Bitsani E, Agriopoulou S, Athanasopoulou C. The cultural nutritional and socio-economic value of Greek messinian olive oil. 2019 In Kavoura A, Kefallonitis E, Giovaris A (eds). *Strategic Innovative Marketing and Tourism. Springer Proceedings in Business and Economics*. Springer, Cham.
36. Kabiri A, Hosseinzadeh-Attar MJ, Haghghatdoost F, Eshraghian M, Esmailzadeh A. Impact of olive oil-rich diet on serum omentin and adiponectin levels: a randomized cross-over clinical trial among overweight women, *International Journal of Food Sciences and Nutrition*. 2017 August; 68(5): p. 560–568.
37. Agriopoulou S, Stamatelopoulou E. Influence of Storage Conditions on the Quality Characteristics of Wines. *EC Nutrition*. 2017 8(3): p. 93-98.
38. Kukreja A, Wadhwa N, Tiwari A. Therapeutic Role of Resveratrol and Piceatannol in Disease Prevention. *Journal of Blood Disorders and Transfusion*. 2014 January; 5: 9.
39. Kita Y, Miura Y, Yagasaki K. Antiproliferative and antiinvasive effect of piceatannol, a polyphenol present in grapes and wine, against hepatoma AH109A cells. *Journal of Biomedicine and Biotechnology*. 2012 October; 672416.
40. Gomez-Zorita S, Tréguer K, Mercader J, Carpéné C. Resveratrol directly affects in vitro lipolysis and glucose

- transport in human fat cells. *Journal of Physiology and Biochemistry*. 2013 September; 69(3): p. 585-593.
41. Holdsworth JE. The importance of human hydration: perceptions among healthcare professionals across Europe. *British Nutrition Foundation Nutrition Bulletin*. 2012 February; 37: p. 16–24.
42. European Food Safety Authority (EFSA). Scientific opinion on dietary reference values for water. *EFSA Journal*. 2010; 8: 1459.



## ANNEX

**Table 1. Guidelines for healthy eating for nurses**

1	Adhere to a normal day and night pattern of food intake which is rich in fruit, vegetables, pulses, whole grains and nuts
2	Eat a variety of food choices: 'complete' meals (animal foods and/or protein rich vegetable foods + non-starchy vegetables and fruits) or vegetarian meals and 'high quality' snacks (from complete and/or vegetarian food groups)
3	Avoid foods and beverages classified as 'low quality snacks' (alcohol or food products with added sugar)
4	Avoid an over-reliance on (high-energy content) convenience foods and high-carbohydrate foods and avoid sugar-rich products and non-fibre carbohydrate foods
5	Maintain regular meal times
6	Divide the 24-intake in to eating events with three satiating meals
7	Avoid or restrict eating between midnight and 6 am; eat at the beginning and end of each shift and avoid eating large meals (>20% of daily energy intake) before sleep
8	Allow adequate time between shifts for meal preparation and sleep
9	Maintain a healthy lifestyle when not working (exercise, regular meal times, good sleep hygiene)