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Ethical Challenges and Opportunities of Nutritional Interventions Study In Night Shift Worker

Hasniah Harun[1*] Ray Wagiu Basrowi[2*]

[1,2] University of Indonesia, Jakarta, Indonesia

*Correspondence: hasniaharun@gmail.com

***ABSTRACT*:** Nutritional intervention research among night shift workers has gained significant attention due to the rising concerns about poor overeating habits in this population. While such studies hold promise for improving health outcomes, they also raise important ethical issues that must be carefully considered. We conducted via the electronic database, Google Scholar. We selected 3 articles from the past 5 years, using the keywords: ethics, nutritional intervention, night shift worker. Articles that do not meet the keywords will be excluded from the review. Total of 3 articles as literature review. these research has a similarity, participants are prohibited from eating between 1 am 6 am. The ethical issues that may arise in these three research are respect for persons (autonomy) and beneficence (non-maleficence). Currently, nutritional interventions among night shift workers commonly involve implementing a five-hour nightly fast. The ethical issues that may arise in this research include respect for persons (autonomy) and beneficence (non-maleficence). As new studies emerge, interventions involving specific nutrients or dietary restrictions, such as carbohydrate/fat intake limitations during night shifts, may present new ethical challenges.

Keywords- ethics, night shift worker, nutritional intervention

INTRODUCTION

Nowadays, Society and scientists have recognized the importance of preventive strategies in maintaining health. Disease prevention efforts take precedence, as preventive measures yield better results and require lower costs compared to treatment and rehabilitation efforts. Thus, currently, scientists are more focused on preventive strategies in preventing metabolic diseases such as diabetes, obesity, cardiovascular diseases (CVDs), and cancer.

As much as 20% of the population in industrialized nations are employed as shift workers (Leung et al., 2021). Night shift workers face higher risks of developing cardiometabolic diseases compared to day workers. This could be linked to the common habit among shift workers of eating at

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night and poor sleep quality (Phoi & Keogh, 2019), which compels the body to process nutrients at a time when it is normally expecting to fast.

Some studies indicate that diet plays a key role in the occurrence of metabolic diseases. Nutritional intervention research among night shift workers has gained significant attention due to the rising concerns about poor overeating habits in this population. While such studies hold promise for improving health outcomes, they also raise important ethical issues that must be carefully considered.

Ethical considerations in research are important for ensuring the integrity and credibility of the research. These considerations are designed to protect the rights, safety, and well-being of participants, as well as the researchers themselves. The aim of this review is to describe the ethical issues that may arise in nutritional interventions among night shift workers.

RESEARCH METHODS

A comprehensive review of the literature was conducted via the electronic database, Google Scholar. We selected 3 articles from the past 5 years, using the keywords: ethics, nutritional intervention, night shift worker. The search strategy was restricted to the English language and human studies. Articles that do not meet the keywords will be excluded from the review.

RESULTS AND DISCUSSION

Result

In total, three articles were included in our review. The first article title is "Rearranging meal times during night shift work promotes weight change: a randomised crossover intervention in shift workers". This study aimed to examine whether redistributing meal times, to create a defined overnight fast period, can improve CVD risk factors in night shift workers. This randomised crossover trial comprised a four-week control period and a four-week intervention period separated by a minimum two-week washout period. During the intervention period, participants were advised to rearrange meal and snack times to create a five hour nightly fast between 1 am and 6 am (Leung et al., 2020).

The second study discusses about shift workers' perceptions and experiences of adhering to a nutrition intervention at night whilst working. This study explored the feasibility of implementing a meal timing intervention during night shift work. During the intervention phase, participants were told not to eat or drink anything except water from 1 to 6 am. They were also advised to adjust their meal times so that they consumed the same amount of energy throughout the day. Before starting the intervention, all participants met with a registered dietitian who helped them plan their meals between 1 am and 6 am (Huggins et al., 2022).

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The third article investigate the effects of a brief overnight fast on cardiovascular disease (CVD) risk markers, primarily focusing on postprandial triglyceride and glucose responses, in night shift workers. Shift workers tend to consume more snacks, night-time food, confectioneries, alcoholic beverages, and sugar-sweetened drinks, and they generally have a lower fiber intake. When total calorie intake is not considered, shift workers consume more refined sugar, fat, and night-time snacks, and they also have more irregular meal patterns (Phoi & Keogh, 2019).

The ethical issues that may arise in this three research are respect for persons (autonomy) and beneficence (non-maleficence). Because these studies has a similarity, participants are prohibited from eating between 1 am and 6 am. This can lead to a decrease in energy and concentration. Restricting meals can increase stress and anxiety among participants, which can negatively impact their mental well-being.

In second study, Participants were asked to change their meal times, each participant met with the study dietitian and Participants were asked to report their dietary intake everyday. This can be a significant burden for participants. It can disrupt their daily routines and cause harm, such as stress.

Table 1. Selected Articles Overview

Article title	Study design	Population	Result
Rearranging meal times during night shift work promotes weight change: a randomised crossover intervention in shift workers	randomised crossover trial	permanent or rotating night shift workers who habitually ate on night shift between 1am to 6am and had abdominal obesity	Body weight was significantly lower at the end of the intervention period compared with at the end of the control period
Shift workers' perceptions and experiences of	randomised crossover trial	night shift workers (rotating or permanent) with	From the analysis of participants' experience with the meal timing intervention,

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adhering to a nutrition intervention at night whilst working: a qualitative study		abdominal obesity	fourteen subthemes were revealed and combined into three major themes: 'the burden of shift work leads to food temptations'; 'workplace structures, environment and culture'; and 'willingness to change requires individual motivation.'
I. DOES REARRANGING MEAL TIMES AT NIGHT IMPROVE CARDIOVASCULAR RISK FACTORS?	pilot randomised crossover trial,	Night shift workers with abdominal obesity	Lower mean body weight post intervention compared to post control.

Discussion

Creating persuasive ethical arguments supporting nutritional research strategies and protocols is crucial for the advancement of nutrition and health. As our understanding grows, nutritional guidance evolves, leading to changes in recommendations over time (Weaver & Miller, 2017).

International guidelines for the conduct of human studies were first set out in the Helsinki Agreement 1964, which have been modified in subsequent years with the most recent being produced in 2013. In the Helsinki Declaration, it is stated that all medical research involving human subjects must undergo a thorough evaluation of the potential risks and burdens compared to the expected benefits for the individuals and groups involved, as well as for others affected by the condition under investigation. Research involving vulnerable groups is justified only if it addresses the health needs or priorities of that group and cannot be conducted on a non-vulnerable group. The vulnerable group should also stand to benefit from the knowledge, practices, or interventions resulting from the research (Woerld Medical Association, 2013).

Research on nutritional interventions shares similarities with clinical trials, thus raising similar ethical issues. There are many ethical issues related to clinical trials, including informed consent, the subject's right to withdraw, the right to refuse, the right to new information, insurance, confidentiality,

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ethical committee, disposal of biological materials, use of placebos, use of vulnerable subjects, mental disorders, competence of the research team, and research subject compensation (Kemenkes, 2021).

The primary ethical principle is the respect for persons, which includes treating individuals as autonomous beings and protecting those with diminished autonomy. Obtaining informed consent from participants is a crucial aspect of research that stems from this principle.

Participants in a research must comprehend the research's purpose. To achieve this, a comprehensive written information sheet should be provided, along with a thorough verbal explanation well before the intervention begins. Only when a participant comprehends the research can their consent be deemed fully informed and legally valid. When choosing participants, researchers should prioritize selecting individuals who are less vulnerable and at lower risk to gather the required data.8

In conducting ethical assessments in research, there are three approaches: goal-based, duty-based, and rights-based. The goal-based approach will inquire whether the research is valid and if the questions being asked are important and novel. Implicit in this assessment is the need to judge whether the scientific approach can answer the questions posed; if not, the study cannot be considered ethical. Therefore, the study must be based on a clearly defined hypothesis or expected outcome. When considering the duty-based view, it is important to assess whether the researcher has considered how their work might impact the research participants in terms of safety issues, pain and discomfort, psychological disturbance, or other inconveniences, and whether the value of the research is sufficient to make these impositions acceptable. Finally, a rights-based approach considers individuals' rights to be fully informed about the research and to keep all data concerning them entirely confidential (Lund, 2003).

Based on Fiona et al.'s research, shift work can impact dietary habits and nutrient intake, although total energy intake between shift workers and day workers appears similar. Shift workers tend to consume more saturated fat and less polyunsaturated fat and dietary fiber. They also show decreased intake of essential micronutrients like vitamins A, D, and E, and zinc compared to day workers. Shift workers also tend to have erratic meal patterns, consume more energy later in the day, and snack more frequently, including during night shifts. Overall, these altered dietary habits among shift workers may have significant implications for health. shift workers, who experience chronic circadian misalignment due to complete reversal of feeding-fasting and wake-sleep behavioral cycles, provide the strongest evidence for these effects. This could have significant health implications, chronic circadian misalignment (Nea et al., 2015; Boege et al., 2021).

When designing dietary interventions for shift workers, it's crucial to address the management of fatigue and meet the specific needs of night work. Shift workers often experience fatigue and mood swings, which can lead to reduced alertness, poor concentration on the job, and lower performance.

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Additionally, their limited energy and time to prepare food make it important for dietary interventions to be practical and suitable for their lifestyle, ensuring compliance (Phoi & Keogh, 2019).

Currently, research on nutritional interventions for night shift workers focuses on creating a five-hour nightly fast between 1 am and 6 am. Therefore, the ethical issues that may arise in these three studies are respect for persons (autonomy) and beneficence (non-maleficence). It is possible that other research will emerge with interventions involving specific nutrients such as vitamins A, D, and E, and zinc, or carbohydrate restriction during night shifts. This will raise other ethical issues.

CONCLUSION

In conclusion, research on nutritional interventions for night shift workers, particularly focusing on implementing a five-hour nightly fast between 1 am and 6 am, has garnered attention due to concerns about poor eating habits in this population. While these studies offer potential health benefits, they also bring forth important ethical considerations. The key ethical issues identified include the respect for persons (autonomy) and beneficence (non-maleficence). As research progresses, it is likely that new studies will emerge with interventions involving specific nutrients or dietary restrictions during night shifts, which will raise additional ethical challenges. Therefore, it is crucial for researchers and ethics committees to carefully weigh these considerations to ensure the well-being and autonomy of study participants are upheld.

REFERENCES

Boege, H. L., Bhatti, M. Z., & St-Onge, M. P. (2021). Circadian rhythms and meal timing: impact on energy balance and body weight. *Current opinion in biotechnology*, *70*, 1-6. https://doi.org/10.1016/j.copbio.2020.08.009.%0A(https://www.sciencedirect.com/science/article/pii/S0958166920301166)

Kemenkes. (2021). Pedoman dan Standar Penelitian dan Pengembangan Kesehatan Nasional. Komisi Etik Penelitian dan Pengembangan Keseheatan Nasional. 1–23 p.

Huggins, C. E., Jong, J., Leung, G. K., Page, S., Davis, R., & Bonham, M. P. (2022). Shift workers' perceptions and experiences of adhering to a nutrition intervention at night whilst working: a qualitative study. *Scientific reports*, *12*(1), 15487. https://doi.org/10.1038/s41598-022-19582-x

Leung, G. K., Davis, R., Huggins, C. E., Rosbotham, E., Warnock, R., & Bonham, M. P. (2020). Rearranging meal times during night shift work promotes weight change: a randomised crossover intervention in shift workers. *Proceedings of the Nutrition Society*, *79*(OCE2), E639.

DOI: 10.46799/jisn.v1i5.24

Leung, G. K., Davis, R., Huggins, C. E., Ware, R. S., & Bonham, M. P. (2021). Does rearranging meal times at night improve cardiovascular risk factors? An Australian pilot randomised trial in night shift workers. *Nutrition, Metabolism and Cardiovascular Diseases*, *31*(6), 1890-1902. https://doi.org/10.1016/j.numecd.2021.03.008.%0A(https://www.sciencedirect.com/science/article/pii/S0939475321001253)%0A

Lund, E. K. (2003). Ethical aspects of human nutritional intervention studies.

Nea, F. M., Kearney, J., Livingstone, M. B. E., Pourshahidi, L. K., & Corish, C. A. (2015). Dietary and lifestyle habits and the associated health risks in shift workers. *Nutrition research reviews*, *28*(2), 143-166.

Phoi, Y. Y., & Keogh, J. B. (2019). Dietary interventions for night shift workers: a literature review. *Nutrients*, *11*(10), 2276.

Weaver, C. M., & Miller, J. W. (2017). Challenges in conducting clinical nutrition research. *Nutrition reviews*, *75*(7), 491-499.

World Medical Association. (2013). Declaration of Helsinki, ethical principles for scientific requirements and research protocols. *Bull World Health Organ*, *79*(4), 373. https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/

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