

# Ethical Issues in Nutrition Intervention Research at the Workplace: A Narrative Review

Rofi Rahmaning Widi<sup>1\*</sup>, Ray Wagiu Basrowi<sup>1,2</sup>

<sup>1</sup>Occupational Medicine Magister Program, Department of Community Medicine, Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia

<sup>2</sup>Health Collaborative Center (HCC), Jakarta, Indonesia

\*Corresponding author: Rofi Rahmaning Widi

E-mail: [rofirahmaning@gmail.com](mailto:rofirahmaning@gmail.com)

## Abstract

**Introduction:** Issues related to ethics discussed in an article are currently still very limited unless the article discusses “ethical issues”. Interventions are treatments that often pose challenges related to ethics during their implementation and even afterward, one of which is intervention in the field of nutrition in the workplace. The aim of this review is to describe ethical issues in nutrition-related interventions in the workplace.

**Methods:** We conducted a search on the PubMed Central database in November 2023 to look at various publications and journals in the last 5 years related to the ethical issue of nutritional interventions in the workplace using the keywords: nutritional interventions, ethics, workplace.

**Results:** Total of 3 journals as literature review. The relationship between the risks and benefits of participating in research is an important aspect of the principle of beneficence. Research can be ethically acceptable if risks have been minimized (both by preventing potential harm and minimizing possible negative impacts) and the benefits of research are greater than the risks. The results illustrate the wide range of nature, types, and scope of existing public health nutrition-related interventions, and the range of ethical issues that may arise from these interventions, in addition to the many different contexts in which they may be applied.

**Conclusions:** The results of this review describe the varying nature, types, and scope of existing (or planned) workplace nutrition-related interventions, the different contexts in which they are implemented, and the various ethical issues that may arise. Ethical issues can only be addressed by considering the complexity of each situation. It is universally agreed that all health research that includes humans as research subjects must be based on the ethical principle of respect for human dignity (respect for person), doing good (beneficence), and justice (justice).

**Keywords:** nutritional, interventions, ethics, workplace

## Abstrak

**Pendahuluan:** Isu-isu terkait etika yang dibahas dalam suatu artikel saat ini masih sangat terbatas kecuali artikel tersebut benar-benar membahas “masalah etika”. Intervensi merupakan pengobatan yang seringkali menimbulkan tantangan terkait etika pada saat pelaksanaannya bahkan setelahnya, salah satunya adalah intervensi di bidang gizi di tempat kerja. Tujuan dari tinjauan ini adalah untuk menjelaskan isu-isu etika dalam intervensi terkait gizi di tempat kerja.

**Metode:** Kami melakukan penelusuran pada database PubMed Central pada bulan November 2023 untuk melihat berbagai publikasi dan jurnal dalam 5 tahun terakhir terkait isu etika intervensi gizi di tempat kerja dengan menggunakan kata kunci: intervensi gizi, etika, tempat kerja.

**Hasil:** Total 3 jurnal sebagai tinjauan literatur. Hubungan antara risiko dan manfaat keikutsertaan dalam penelitian merupakan aspek penting dari prinsip beneficence. Penelitian dapat diterima secara etis jika risiko telah diminimalkan (baik dengan mencegah potensi bahaya maupun meminimalkan kemungkinan dampak negatif) dan manfaat penelitian lebih besar dibandingkan risikonya. Hasil penelitian ini menggambarkan beragamnya sifat, jenis, dan ruang lingkup intervensi terkait gizi kesehatan masyarakat yang ada, dan berbagai masalah etika yang mungkin timbul dari intervensi ini, selain berbagai konteks penerapan intervensi tersebut.

**Kesimpulan:** Hasil tinjauan ini menggambarkan beragam sifat, jenis, dan ruang lingkup intervensi terkait gizi di tempat kerja yang ada (atau direncanakan), perbedaan konteks penerapannya, dan berbagai masalah etika yang mungkin timbul. Masalah etika hanya dapat diatasi dengan mempertimbangkan kompleksitas setiap situasi tertentu. Telah disepakati secara universal bahwa semua penelitian kesehatan yang memasukkan manusia sebagai subjek penelitian harus didasarkan pada prinsip etika penghormatan terhadap harkat dan martabat manusia (penghormatan untuk orang), berbuat baik (beneficence), dan keadilan (justice).

**Kata Kunci:** intervensi gizi, etika, tempat kerja

## Introduction

Issues related to ethics discussed in an article are currently still very limited unless the article actually discusses “ethical issues”. Kass defines an ethical framework as an analytical tool designed to help public health professionals consider the ethical implications of proposed interventions, policy proposals, research initiatives, and programs.<sup>1</sup>

To achieve traditional public health goals while maximizing individual freedom and advancing social justice, public health interventions must reduce morbidity and mortality; data must prove that a program (or a series of programs of which a program is part) will reduce morbidity and mortality; program burdens must be identified and minimized; this program must be implemented fairly and at certain times must minimize pre-existing social injustice; and fair procedures must be used to determine which burdens are acceptable to society<sup>1</sup>. In order to achieve appropriate public health goals, we must minimize the level of interference or coercion in people’s lives and personal choices.<sup>2</sup>

Some classical ethical approaches seem to support different conclusions in some cases.<sup>3</sup>these decision makers need technical support and ethical guidance for adaptation of interventions to local (cultural, social, economic, etc. Considering this pluralistic society, creating clear ethical guidelines, especially in the context of research ethics, is increasingly necessary in order to be able to make ethical decisions about what is permissible and what is not permissible in health research.<sup>3</sup>these decision makers need technical support and ethical guidance for adaptation of interventions to local (cultural, social, economic, etc.

The relationship between the risks and benefits of participating in research is an important aspect of the principle of beneficence. At the start of an investigation of an innovative intervention, researchers do not know all the potential risks, the intervention is still unknown. They can make estimates, especially by looking at the existing literature on similar interventions. But until they make innovative interventions, no one knows what might happen in all the circumstances. This explains why many interventions are initially studied on a very small scale, putting only a few people at risk.<sup>4</sup>

Intervention research sometimes involves special ethical issues related to consent. Four areas that require attention are: client (or patient) dependence

on researchers to receive needed services, establishing participant capacity to provide consent, who provides consent in macro-level intervention research, and incentive payments.<sup>4</sup>The workplace has been recognized as a high- priority setting for health promotion and disease prevention in the working population. It has been shown previously that corporate management leadership is essential for the success of workplace health promotion programs. In this regard, modifying workplace dietary environments should be an important element.<sup>5</sup>

The aim of this review is to describe and map ethical issues in nutrition-related interventions in the workplace.

## Methods

We conducted a search on the PubMed Central database in November 2023 to look at various publications and journals in the last 5 years related to the ethical issue of nutritional interventions in the workplace using the keywords: nutritional interventions, ethics, workplace. For searches using these keywords, more emphasis is placed on filtering the title and abstract of the research. Research journals that meet these criteria are then included as inclusion. Meanwhile, the exclusion criteria are various journals that do not meet the previous criteria.

## Results

Three articles discuss nutritional interventions in the workplace. The first article discusses nutritional interventions in the form of salt intake for workers.

This study aimed to evaluate the effects of workplace dietary intervention on employees’ salt intake and Na/K ratio. This intervention included the provision of healthy lunches and nutrition education along with corporate management leadership. In addition, to examine the effects of healthy lunch and nutrition education on changes in salt intake separately, this study compared changes in salt intake and Na/K ratios between those with and without healthy lunch consumption in the intervention workplace.<sup>5</sup>

An ethical issue that can arise from this intervention is autonomy. This study was a non-randomized controlled trial (quasi-experimental study). The intervention program (Company A) comprised healthy lunch and nutrition education, and the control group (Company B) did not receive any intervention. For Company A, a comparison of the participant's distribution and the person's numerical values were returned, while for Company B, only the person's numerical values were returned.

A person's decisions should be free from coercion. However, researchers may not be aware of subtle forms of coercion that may influence the decisions of potential research participants.<sup>4</sup> This research may also represent forms of coercion that intervention research researchers must employ. Best practice is to ensure that people involved in the research participation request and consent process with potential research participants are not also involved in any aspect of providing services to them. This also helps minimize the potential or emergence of conflicts of interest where practitioners may have an interest in the research results, to the point where their behavior, whether intentionally or unintentionally, interferes with the research results.<sup>4</sup>

This study was impossible to examine the individual effects of the healthy lunch and nutrition education. Access to health interventions that are proven to be safe and effective must be made available to research participants.

The second study aims to investigate the effects of using the supplementation of vitamin E and Omega 3 fatty acids on reproductive indices among workers in an automobile parts manufacturing plant. The effect of exposure to electromagnetic fields on certain sex hormones and sperm parameters will also be assessed. The participants were deployed into four groups as per the double-blind block randomization method.<sup>6</sup>

The participants were divided into 4 groups in a double-blind random clinical trial study. Comparing the initial and final energy intake, macronutrients, and nutrients influential on target variables reveal no significant difference in any of the groups. This indicates that the participants had not made any major changes to their diets as asked. As per the results, the difference in the level of testosterone, before or after the intervention, was not significant in any of the supplement groups. Overall, a higher testosterone level was observed in the supplement groups after the intervention compared with before intervention. The highest testosterone levels after

intervention belonged to the vitamin E + Omega group. The mean level of FSH and LH had gone down overall after the intervention.<sup>6</sup>

Research can be ethically acceptable if risks have been minimized (both by preventing potential harm and minimizing possible negative impacts) and the benefits of research are greater than the risks. Apart from that, it also ensures that the benefits and burdens are distributed evenly, no group status/level is subject to greater risks/burdens. Subjects are involved/selected based on scientific considerations, not recruited based on socio-economic status, or based on authority, or ease of manipulation or selection. Exclusion criteria may exacerbate health disparities; therefore, the justification for the exclusion criteria of groups requiring special protection is justified. Groups that are unlikely to benefit from knowledge gained from research do not have to bear a share of the risks and burdens in proportion to the risks and burdens.

The third article evaluated the effectiveness of a workplace nutrition program on anemia reduction in female RMG workers of Bangladesh.<sup>7</sup> A quasi-experimental mixed method study was conducted on 1310 non-pregnant female RMG workers from four factories. Two types of intervention packages (A and C) were tested against their respective controls (B and D) over a 10-month period. Among factories that already provided lunch to workers with regular behavior change counseling (BCC), one intervention (A) and one control (B) factory were selected, and among factories that did not provide lunches to their workers but provided regular BCC, one intervention (C) and one control (D) factory were selected: (A) Lunch meal intervention package: daily nutritionally-enhanced (with fortified rice) hot lunch, once weekly iron-folic acid (IFA) supplement and monthly enhanced (with nutrition module) behavior change counseling (BCC) versus (B) Lunch meal control package: regular lunch and BCC; and (C) Non-meal intervention package: twice-weekly IFA and enhanced BCC versus (D) Non-meal control package: CC alone. Body weight and capillary hemoglobin were measured. Changes in anemia prevalence were estimated by difference-in-difference (DID) method.<sup>7</sup>

This project had some limitations, e.g., (a) intervention duration was only 8–10 months; (b) interventions were not systematically tracked, particularly the IFA distribution; (c) compliance of IFA was low; (d) factory non-compliance (delay in providing information

of workers, interfering in scheduling and during conduction of interview time); (e) lack of intervention randomization among pilot factories might not reflect the true effect of intervention; (f) about 40% of workers were lost to follow-up from baseline, (g) replacements of participants were done only based on age category and intervention duration, and (h) possibilities of iron deficiency anemia could not be ruled out due to lack of iron level testing in blood, which could have created a spurious effect on the findings.

The study team could not measure the food intake and changes in factory productivity as the data were collected by another organization and not available to study investigators. We also could not rule out the other causes of anemia due to hemoglobinopathies, which is not rare in our country context.<sup>7</sup>

The importance of confidentiality ethics is a natural gift to humans as the highest species that keeps promises. The general norm against breaking promises is wrong because it damages the autonomy of the person to whom the promise has been made, responsibilities that cause

harm, and damages the reputation of social institutions that uphold promises and public trust. The issue of trust has further significance in relation to research. Researchers often need access to the kind of information on informants that people are reluctant to reveal.<sup>8</sup>

## Discussion

Research is an inseparable part of the world of education and scientific development. Good research will provide a complete picture and solution to an event in society that is evidence-based and capable of being integrated into society.<sup>9</sup>

The results of this scoping review demonstrate that nutrition-related workplace interventions can take many forms and their nature, aims, scope and target populations can vary widely. Such interventions can also occur at different levels, in different contexts, with the collaboration of various stakeholders. As a result, the ethical issues faced in the development and

**Table 1.** Selected article overview

Article title	Study design	Population	Result
Effect of workplace dietary intervention on salt intake and sodium- to- potassium ratio of Japanese employees: A quasi-experimental study	Quasi-experimental study	Two small business establishments in Saitama Prefecture, Japan, were allocated as the intervention (n = 69) and comparison (n = 68) workplaces	The adjusted difference in changes in salt intake between workplaces was statistically significant. Although no significant change was observed in the Na/K ratio in the intervention workplace, the adjusted difference in changes between the workplaces was statistically significant.
The Influence of Vitamin E and Omega-3 Fatty Acids on Reproductive Health Indices Among Male Workers Exposed to Electromagnetic Fields	Double-blind block randomization clinical trial	Workers in an automobile parts manufacturing plant	Univariate analysis of variance indicated that exposure to electric fields had a statistically significant effect on sperm count, morphology, and motility. The simultaneous consumption of vitamin E + Omega 3 had a statistically significant effect on sperm morphology and motility.
Effectiveness of Workplace Nutrition Programs on Anemia Status among Female Readymade Garment Workers in Bangladesh: A Program Evaluation	A quasi-experimental, mixed method study design	Female Readymade Garment  Workers in Bangladesh	Workplace nutrition programs can reduce anemia in female RMG workers, with the greatest benefits observed when both nutritionally enhanced lunches and IFA supplements are provided

implementation of nutrition-related public health interventions are very diverse and cannot be equated or generalized.

In considering the limits of acceptable risk levels, and the balance of risks regarding benefits, considerations are needed that refer to basic moral and ethical theories previous statement and research code of ethics statement. Almost every study that including human subjects will introduce some “consequences” such as risks such as inconvenience, time sacrifice, or cost. Some appropriate benefits it seems necessary to justify that for the sake of balance. Therefore, it is important distinguish between various types of benefits of research results and various moral meanings in terms of subject. For example, the subject may benefit from the experimental treatment, even if it does not yet proven to be good and still needs improvement, and as some subjects will allocated as a control group (placebo). Clinical research like this is aimed at benefit “future patients”. Quality of life improves with treatment developed and/or adopted as a result of research or by being avoided treatments that have been shown to be ineffective or harmful.<sup>8</sup>

The definition of scientific misconduct has not yet been agreed upon by consensus. Various activities are referred to as scientific violations, for example fraud, plagiarism, double publication, harm to research participants, etc. The 1995 US Research Integrity Commission report defined scientific misconduct as the seizure of intellectual property with the aim of intentionally impeding the progress of research at the risk of undermining the integrity of the scientific record and practice. Meanwhile research misconduct was defined more succinctly by the US Office of Research Integrity in 2000 as ‘falsification, falsification, or plagiarism in proposing, conducting, reviewing, or reporting research’.<sup>10</sup>

Every implementation of an intervention must be accompanied by a plan to monitor and evaluate its impact, including its ethical impact. What constitutes strong “evidence” in public health programs and interventions remains a controversial issue. There are two types of evidence that are relevant in this area: evidence about the causes of ill health, and evidence about the efficacy and effectiveness of interventions. Although the focus is primarily on evidence-based practice, such evidence is often difficult to obtain, lacking or incomplete.<sup>3</sup>these decision makers need technical support and ethical guidance for adaptation

of interventions to local (cultural, social, economic, etc.

Evidence regarding the impact of interventions on nutrition in one context may not necessarily apply to other contexts.<sup>3</sup>these decision makers need technical support and ethical guidance for adaptation of interventions to local (cultural, social, economic, etc. It is often suggested that in the face of a significant public health problem, “doing something is better than doing nothing” and “is there any harm in trying?”. This viewpoint implies that interventions can be implemented if they are expected to be effective, without waiting for sufficient evidence. However, this attitude is clearly problematic from an ethical point of view, as such interventions may not provide beneficial results or even be unsafe. Conversely, a lack of evidence and/or the absence of data such as possible relevant indicators may hinder the implementation of necessary public health interventions, and requires careful assessment of the risks and benefits of any intervention before its implementation, even if there is no available evidence on the matter.<sup>3</sup>

Several ethical, legal and social issues have been discussed by global and national medical organizations as well as by experts regarding all aspects of medical activities in the world of medicine. Because the discussion is the same, these three aspects are often shortened to ELSI (ethical, legal and social issues) to facilitate dynamic analysis of these three aspects.<sup>11</sup>

## Conclusions

The results of this review describe the varying nature, types, and scope of existing (or planned) workplace nutrition-related interventions, the different contexts in which they are implemented, and the various ethical issues that may arise.

Interventions are treatments that often pose challenges related to ethics during their implementation and even afterward, one of which is intervention in the field of nutrition in the workplace

Ethical issues can only be addressed by considering the complexity of each particular situation. This scoping review also illustrates the methodological challenges that must be faced when conducting such reviews and is a necessary and useful step in the design and achievement of future research that seeks to identify the ethical issues raised by nutrition-related interventions in the

workplace and in efforts to identify ethical issues.

In accordance with the 2016 CIOMS International Guideline, both Epidemiological Research (1991) and Individual Human Research (2002), it is universally agreed that all health research that includes humans as research subjects must be based on the ethical principle of respect for human dignity (respect), doing good (beneficence), and justice (justice).<sup>8</sup>

Development of an ethical framework for policy makers and health professionals. We suggest that, given the complexity and diverse nature of interventions and contexts in the field of public health nutrition, future reviews should focus only on specific interventions, without limiting their search to articles or studies that explicitly address ethical issues. Each item in the sample of publications should then be reviewed and analyzed in order, first, to identify ethical issues, whether addressed or not, and second, potential gaps in existing recommendations and guidelines related to nutrition-related interventions.

## References

1. Kass NE. An ethics framework for public health. *Am J Public Health* 2001;91:1776–82.
2. Nuffield Council on Bioethics. *Public Health : Ethical Issues*. London: Cambridge Publishers Ltd; 2007. 225 p.
3. Hurlimann T, Peña-Rosas JP, Saxena A, Zamora G, Godard B. Ethical issues in the development and implementation of nutrition-related public health policies and interventions: A scoping review. *PLoS One* 2017;12:1–25.
4. Begun A. *Research & Statistics for Understanding Social Work Interventions*. The Ohio State University; 2018.
5. Sakaguchi K, Takemi Y, Hayashi F, Koiwai K, Nakamura M. Effect of workplace dietary intervention on salt intake and sodium-to-potassium ratio of Japanese employees: A quasi-experimental study. *J Occup Health* 2021;63:1–12.
6. Mohammadi H, Golbabaie F, Dehghan SF, Imani H, Ramezani Tehrani F, Khodakarim Ardakani S. The Influence of Vitamin E and Omega-3 Fatty Acids on Reproductive Health Indices Among Male Workers Exposed to Electromagnetic Fields. *Am J Mens Health* 2022;16(1).
7. Hossain M, Islam Z, Sultana S, Rahman AS, Horz C, Haque A, et al. Effectiveness of Workplace Nutrition Programs on Anemia Status among Female Readymade. *Nutrients* [Internet] 2019;11:1–23. Available from: [www.mdpi.com/journal/nutrients](http://www.mdpi.com/journal/nutrients) <https://www.mdpi.com/473584>.
8. Kementerian Kesehatan RI. *Pedoman dan Standar Etik Penelitian dan Pengembangan Kesehatan Nasional*. Komisi Etik Penelit dan Pengemb Kesehat Nas Kementerian Kesehat Republik Indones 2017;1–158.
9. Akbar F, Basrowi RW. Issues About Digital Informed Consent in Clinical Research. *Indones J Community Occup Med* 2022;2:40–7.
10. Pradnyaparamitha DA, Zulkarnain HS, Basrowi RW. Scientific Misconduct in Asbestos-related Occupational Health Studies: A Literature Review on the Impact of Intellectual Dishonesty to Scientific Research. *Indones J Community Occup Med* 2023;2:143–9.
11. Permatasari G, Basrowi RW. Telemedicine: A Literature Review on Ethical, Legal, and Social Issue (ELSI). *Indones J Community Occup Med* 2023;3:123–9.