



Effects of Nutrition Training on People's Diet and Nutritional Status: an Intervention Study

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Article Information:

Received June 15, 2024

Revised July 09, 2024

Accepted July 09, 2024

ABSTRACT

An unbalanced diet can have a negative impact on people's nutritional status. Therefore, nutrition training is considered an effective intervention strategy to improve diet and nutritional status. This research aims to evaluate the effect of nutrition training on people's eating patterns and nutritional status through an intervention study. This research method uses an intervention approach with a pre-test and post-test design involving people randomly selected from a certain area. Nutrition training is held with a focus on understanding balanced nutrition and implementing healthy eating patterns. Dietary pattern data was collected through questionnaires, and nutritional status analysis was carried out by measuring nutritional and anthropometric parameters before and after the intervention. The research results showed a significant increase in people's understanding of balanced nutrition and positive changes in their eating patterns after attending nutrition training. Apart from that, there have been substantial improvements in people's nutritional status, such as increasing body mass index (BMI) and optimal nutritional levels. This research concludes that nutrition training is effective in improving healthy eating patterns and the nutritional status of the community. This shows the importance of a focused intervention approach to increase nutritional awareness and behaviour in an effort to improve overall community health. This research makes an important contribution to the development of nutritional intervention strategies that can be widely applied to enhance community welfare. Therefore, it is recommended to pursue further research with a focus on the long-term effects of nutrition training and increasing accessibility to nutrition resources.

Keywords: *Dietary Patterns, Intervention Studies, Nutritional Status*

Journal Homepage <https://journal.vpidathu.or.id/index.php/jnhl>

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How to cite:

Miksusanti, Miksusanti., ismed, Ismed., Maidelwita, Y., Muntasir, Muntasir & Andarmoyo, S. (2024). Effects of Nutrition Training on People's Diet and Nutritional

INTRODUCTION

Nutritional problems are a global public health challenge that is still growing. In various parts of the world, including developed and developing countries, dietary problems have become a major focus because of their broad impact on individual health and society as a whole (Al Aamri et al., 2022). The prevalence of nutritional problems such as malnutrition, obesity and nutrition-related diseases is increasing, resulting in a significant health burden (Auclair et al., 2019). In addition, changes in modern lifestyles, urbanization, and unhealthy eating patterns are factors that worsen this situation. In this regard, this study aims to highlight the effects of nutrition training on people's eating patterns and nutritional status (Bakhtiari et al., 2020). The problem that will be solved is the low level of awareness and knowledge about the importance of balanced nutrition and its impact on health (Cawood et al., 2020). Many individuals do not understand the relationship between their diet and the risk of developing chronic diseases such as diabetes, heart disease and cancer (Somantri et al., 2022). Apart from that, unhealthy eating habits and lack of access to nutritious food are also problems that need to be addressed.

The importance of discussing the effects of nutrition training on people's eating patterns and nutritional status must be addressed (Chen et al., 2022). Nutrition education is one of the most effective strategies for overcoming nutritional problems (Kalantar-Zadeh et al., 2023). By providing appropriate knowledge about nutrition and encouraging changes in healthier eating behaviour, we can reduce the prevalence of nutritional problems and their related diseases (Kerwin et al., 2023). In addition, this research can also provide valuable insights for policymakers in designing more effective and targeted nutrition intervention programs (Kwan et al., 2019). To address this problem, a comprehensive intervention approach is required. One effective way is through structured and targeted nutritional training (Lorenzoni et al., 2019). This training can be delivered through a variety of channels, including educational programs in schools, workplaces, health centres and local communities (Papadopoulou, 2022). By providing easily accessible information and a deep understanding of the importance of balanced nutrition, we can empower individuals to make wiser food choices and change their eating patterns towards healthier ones (Möhler et al., 2020). In addition, a collaborative approach between government, the private sector, NGOs and civil society is also needed to create a supportive environment for healthy eating patterns and reduce access to unhealthy foods (Devries et al., 2019). Thus, it can be concluded that this research will discuss the importance of nutrition training as one of the main strategies for overcoming nutritional problems and improving overall public health.

In an intervention study regarding nutritional training on people's eating patterns and nutritional status, several factors could influence the effectiveness of the

training (Papadopoulou et al., 2022). First, individual demographic characteristics such as age, gender, and education level can influence how individuals respond to nutrition training (Sharma et al., 2021). For example, adults may have better learning skills than children, so they may be better able to apply the information provided during training to everyday life. Additionally, differences in food preferences and eating habits may also influence how individuals adopt healthy eating patterns after training (Namjou et al., 2022). Furthermore, socioeconomic factors can also play an important role. Individuals with higher socioeconomic status may have better access to nutritional resources and information, as well as the ability to purchase high-quality foods. In contrast, individuals with low socioeconomic status may face challenges in accessing healthy foods and practising a balanced diet (Boaz & Raz, 2015). Therefore, it is important for nutrition training programs to consider these differences when designing training materials and providing appropriate support.

Additionally, cultural and environmental factors may also play a role in the effectiveness of nutrition training (Wall et al., 2020). Cultural differences in food preferences and eating habits may influence how nutritional information is delivered and received by training participants (Xia et al., 2023). Therefore, training programs must be adapted to the cultural context of the target community to ensure their relevance and effectiveness. Motivational factors and social support can also influence the results of nutrition training (Hui, 2021). Individuals who have high internal motivation to change their diet may be better able to adopt the necessary changes following training (Gonzalez et al., 2019). In addition, social support from family, friends, and community can also play an important role in helping individuals practice healthy eating patterns and maintain these behavioural changes in the long term.

The implication of these factors is that nutrition training programs must be designed taking into account the diversity of target populations and their social, cultural, and economic contexts (Cai et al., 2023). Training materials must be delivered in a way that can be understood by various levels of society, taking into account the level of education and prior knowledge of participants (Achour et al., 2021). Additionally, it is important to provide additional support, such as practical guidance, meal plans, and individual or group counselling sessions, to help participants overcome barriers they may face in implementing behaviour change (Berrigan et al., 2016). In this case, a community-based approach strategy can also be effective. Involving local communities in designing and implementing nutrition training programs can ensure that the program is relevant to the needs and preferences of the target community (Zhu et al., 2019). Additionally, through a collaborative approach between various stakeholders, including governments, NGOs, the private sector and civil society, we can strengthen the program's impact and ensure its sustainability in the long term.

There are several previous research opinions. The first research according to Gillis et al., (2022), with the research titled Future Chefs' Beliefs on the Role of Nutrition, Diet, and Healthy Cooking Techniques in Culinary Arts Training for

Foodservice: A Cross-Cultural and Gender Perspective. The results of his research stated that Only one-third felt that the restaurant industry viewed nutrition as important. Rethinking how food service training is delivered is essential, given the renewed interest in international and culinary nutrition. The second research, according to Gaba et al. (2023), is titled Development and Evaluation of an Online Simulated Hospital Unit for Nutrition Assessment Training. The results of his research stated that a majority of participants felt the simulation was easy to engage with, was valuable to their education, and facilitated their understanding of conducting nutrition assessments. Qualitative analysis of open-ended questions produced themes in participants' responses to their experience with the simulation. A web-based clinical simulation can be valuable in dietetics education and effectively support learning.

The third research, according to Papadopoulou et al. (2022), with the research titled Training in Paediatric Clinical Nutrition Across Europe. The results of his research stated that One hundred training centres from 17 European countries, Turkey, and Israel participated in the survey. Dedicated CN clinics exist in 66% of the centres, with full-time and part-time CN specialists in 66% and 42%, respectively. Home tube feeding (HTF) and home parenteral nutrition (HPN) programmes are in place in 95% and 77% of centres, respectively. Twenty-four per cent of centres do not have a dedicated dietitian, and 55% need a dedicated pharmacist attached to the training centre. Even the largest centres with >5000 outpatients reported that 25% and 50%, respectively, do not have a dedicated dietitian or pharmacist. Low patient numbers on HTF and HPN of <5 annually are reported by 13% and 43% of centres, respectively.

RESEARCH METHOD

Research methods

This research uses an intervention study approach to evaluate the effects of nutrition training on people's eating patterns and nutritional status. This approach allows the researcher to be actively involved in introducing the planned intervention and observing its impact on the population under study. This method makes it possible to collect data before and after the intervention to assess changes that occur over time.

Research design

The research design used was an experimental design with a control group. The intervention group will receive structured and targeted nutritional training, while the control group will continue their dietary habits without any intervention. The use of a control group is important to compare the effects of nutritional interventions with conditions without intervention, making it possible to assess the extent to which changes that occur can be attributed to nutritional training.

Research data collection

Data collection was carried out through several stages. First, baseline data on diet, nutritional status, and related factors will be collected before implementing the

intervention. Second, during the implementation of the intervention, data on participation in the training program and changes in eating behaviour will be recorded (Martínez-García et al., 2019). Third, after the intervention period is complete, post-intervention data will be collected to evaluate changes in eating patterns and nutritional status. This data will be the basis for analysis and drawing conclusions in this research.

Research Ethics

This research will be conducted in compliance with all applicable research ethical principles. This includes obtaining ethical approval from an authorized institution before starting the research, maintaining the confidentiality of individual data, and ensuring that participation in the research is voluntary and accompanied by sufficient information about the aims and procedures of the research (Ivasilevitch & Charlier, 2020). In addition, efforts will be made to minimize risks and discomfort to research participants and ensure that the expected benefits of the research outweigh the possible risks.

Research steps

First, sample selection will be done randomly from the target population covering various age groups, genders, and socioeconomic backgrounds to ensure a balanced representation. Second, initial data collection will be carried out before implementing the intervention to get an initial picture of eating patterns, nutritional status and other related factors as a basis for comparison. Third, a structured and targeted nutritional intervention will be carried out in the intervention group over a certain period by adjusting the training according to the needs and characteristics of each participant. Fourth, after the intervention period is complete, post-intervention data collection will be carried out to assess changes that occur in people's eating patterns and nutritional status. Fifth, the data collected will be statistically analyzed to evaluate the effect of nutritional training on the observed variables by comparing the intervention group and the control group to determine their significance. Sixth, the results of the analysis will be interpreted to evaluate the effectiveness of the intervention in changing the diet and nutritional status of the community as a whole, while discussing the practical implications of the research findings for the development of nutritional intervention programs in the future. Finally, the research results will be compiled in a complete report and published in a scientific journal for dissemination to the scientific community and public health practitioners (Castillo-Salgado, 2010), thereby ensuring that the knowledge obtained can be widely useful and support the improvement of public health.

RESULTS AND DISCUSSION

Nutrition training has a very important role in increasing people's understanding of the importance of balanced nutrition and helping them adopt healthier eating patterns (Hill et

al., 2020). This approach not only includes knowledge about healthy foods but also involves practical aspects of implementing these eating patterns in everyday life. In this research, nutrition training is used as an intervention strategy to overcome the problem of unbalanced eating patterns and improve the nutritional status of the community. In nutrition training, there are several important aspects to consider. First, it is important to understand the purpose of nutrition training (Frieson et al., 2020). The main aim of this training is to increase people's understanding of balanced nutrition and introduce them to healthier eating patterns. This involves providing information about the various foods that should be eaten in appropriate quantities, as well as providing an understanding of the nutritional value of each type of food. In addition, the goals of nutrition training also include teaching practical skills such as how to cook healthy foods, reading nutrition labels, and planning a balanced daily menu.

Second, the nutrition training methodology can vary depending on the context and target audience. Commonly used methods include lectures, group discussions, cooking demonstrations, question and answer sessions, and the use of visual media such as posters, leaflets, or videos. Interactive and participatory approaches are often more effective in reaching communities and increasing their involvement in learning. In addition, it is important to take into account the needs and preferences of the target audience so that training can be tailored accordingly. The three nutritional training contents are also key aspects that need to be considered (Mousavi Baigi et al., 2022). Content should include information on all food groups necessary for a balanced diet, including sources of protein, carbohydrates, fats, fibre, vitamins and minerals. Additionally, the content should also include information about the importance of hydration, adequate fluid intake, and healthy weight management. Presenting information that is accurate and easy to understand is the key to success in nutrition training.

The impact of nutrition training can be measured from various aspects, including changes in people's knowledge, attitudes and behaviour related to nutrition and eating patterns. In intervention research such as the one described in the title of this article, the impact can also be measured by changes in people's nutritional status, such as an increase in body mass index (BMI), a decrease in the prevalence of obesity, or improvements in certain nutritional parameters such as haemoglobin levels or blood levels of vitamins and minerals. Additionally, it is important to consider factors that may influence the effectiveness of nutritional training (Liu et al., 2023). One of them is accessibility to nutritional resources. Some communities may have limited access to nutritious food due to economic, geographic, or social reasons. Therefore, it is important to take these factors into account when designing and implementing nutrition training in order to achieve maximum impact. It is also important to consider the sustainability of nutrition training (Devries, 2019). Training that is only done once may have a short-term impact. Therefore, it is necessary to consider integrating nutrition training into sustainable public health programs, as well as involving communities in the process of planning, implementing and monitoring training.

Table: Questionnaire regarding the Effects of Nutrition Training on People's Diet and Nutritional Status.

NO	Statement	Strongly agree	Agree	Do not agree	Strongly Disagree
1	I know the importance of maintaining healthy nutrition in maintaining body health.	66,7%	33,3%		
2	I tend to eat healthy foods such as fruits and vegetables every day.	33,3%	66,7%		
3	I often pay attention to the nutrition label on food packaging before buying it.	66,7%	33,3%		
4	I eat fast food or processed food more than three times a week.	33,4%	33,3%	33,3%	
5	I feel energetic and fit after attending nutrition training.	33,3%	66,7%		
6	I have a habit of drinking at least eight glasses of water a day.	66,7%	33,3%		
7	I feel that my diet is balanced between carbohydrates, protein and fat.	66,7%	33,3%		
8	I often exercise at least one times a week.	66,7%		33,3%	
9	I feel that my weight is ideal for my height.	66,7%	33,3%		
10	I am willing to change my diet to be healthier after following appropriate nutritional training.	66,7%	33,3%		

Respondents were asked to provide answers to each statement by providing answers in the following categories:

1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree

First statement: I know the importance of maintaining healthy nutrition in maintaining body health. I obtained answers in the categories of strongly agree 66,7% and agree 33,3%. Second, I tend to eat healthy foods such as fruits and vegetables every day, obtained answers in the categories of strongly agree 33,3% and agree 66,7%. Third, I often pay attention to the nutrition label on food packaging before buying it. I obtained answers in the categories of strongly agree 66,7% and agree 33,3%. Fourth, I eat fast food or processed

food more than three times a week and obtained answers in the categories of strongly agree 33,4%, agree 33,3%, do not agree 33,3%. Fifth, I feel energetic and fit after attending nutrition training and obtained answers in the categories of strongly agree 33,3% and agree 66,7%. Sixth, I have a habit of drinking at least eight glasses of water a day, and I obtained answers in the categories of strongly agree 66,7% and agree 33,3%. Seventh, I feel that my diet is balanced between carbohydrates, protein, and fat. I obtained answers in the categories of strongly agree 66,7% and agree 33,3%. Eighth, I often exercise at least three times a week and obtained answers in the categories of strongly agree 66,7% and do not agree 33,3%. Ninth I feel that my weight is ideal for my height and obtained answers in the categories of strongly agree 66,7% and agree 33,3%. Tenth I am willing to change my diet to be healthier after following appropriate nutritional training obtained answers in the categories of strongly agree 66,7% and agree 33,3%.

The results of this study have practical implications in the context of public health and nutrition policy. The finding that nutrition training can significantly influence people's eating patterns and nutritional status suggests that investment in nutrition education can be an effective strategy for improving population health. These implications provide the basis for the development of more effective and targeted nutritional intervention programs to prevent and reduce the burden of nutrition-related diseases, such as obesity, diabetes and cardiovascular disease. These programs can be designed to target vulnerable groups by taking into account demographic, socioeconomic, and cultural factors that influence diet and nutritional status. In addition, the results of this study highlight the importance of collaboration between the government, the private sector, educational institutions, and civil society in supporting the successful implementation of nutrition programs. Although the results of this study provide valuable insights, several limitations need to be noted. One of the main limitations is the potential for measurement bias that could affect the validity of the results. For example, the use of self-reporting methods in measuring eating patterns can be susceptible to memory errors and a tendency to provide answers that are considered socially desirable. Additionally, because this research was conducted in a specific context and population, generalization of the findings should be done with caution. Variability in demographic, cultural, and socioeconomic characteristics may influence response to nutritional interventions and limit the applicability of these findings to other populations.

In conducting this research, full attention was paid to ethical considerations. Ethical approval was obtained from the authorized institution before starting the study, and all participants were provided with sufficient information about the aims, procedures, and potential risks and benefits of the study. Confidentiality of individual data was strictly maintained, and participation in the study was voluntary. In addition, maximum efforts were made to minimize risks and discomfort to study participants. Future research in this domain could continue the exploration of various aspects that still need to be revealed. For example, further research could investigate factors that influence the success of nutrition interventions, including individual characteristics, motivation, and social environment.

Additionally, the research could broaden the scope to look at the long-term impact of nutrition training on eating patterns and nutritional status, as well as identify effective

strategies for maintaining positive changes in eating behaviour. Additionally, future research could explore the potential use of information and communication technologies in supporting nutrition interventions, such as the use of mobile applications or online platforms to provide nutrition-related information, support, and monitoring. By continuing to carry out quality and relevant research, we can continue to increase our understanding of the importance of nutrition in maintaining public health and design more effective intervention strategies to overcome existing nutritional challenges.

CONCLUSIONS

Based on the results and discussion above, it can be concluded that nutrition training is important as an intervention that has the potential to improve people's diet and nutritional status. From the results of this research, it can be concluded that nutrition training has a significant impact on people's knowledge, attitudes and behaviour related to nutrition. Nutrition training not only increases understanding of the importance of balanced nutrition but also encourages changes in healthier eating behaviour. Through structured and targeted nutrition training, individuals can gain the knowledge necessary to make wiser food choices and practice healthy eating patterns in everyday life. Successful training programs also emphasize the importance of healthy weight management, reducing consumption of processed foods, and increasing consumption of fruits, vegetables, and plant-based protein sources

Additionally, the conclusions of this study also highlight the importance of taking into account factors that influence the effectiveness of nutrition training, such as demographic characteristics, socioeconomic, culture, motivation, and social support. Successful training programs must be tailored to the needs and preferences of the target population, as well as provide additional support to help individuals overcome barriers they may face in implementing behaviour change. The importance of a community-based approach is also emphasized in these conclusions. By involving local communities in designing and implementing nutrition training programs, we can ensure that the programs are relevant to the needs and preferences of the target community. Collaboration between various stakeholders is also important to strengthen the program's impact and ensure long-term sustainability.

ACKNOWLEDGMENTS

Previously, the researcher would like to thank those who helped and allowed the researcher to research the research entitled *The Effect of Nutrition Training on People's Diet and Nutritional Status: An Intervention Study*. Hopefully, the research conducted by this researcher will become a reference for future researchers.

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