



## Analysis of the Use of Health Education Methods in Increasing Public Nutrition Awareness

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### ABSTRACT

Public nutritional awareness is an important factor in realizing a healthy diet and balanced lifestyle. Health education methods have a vital role in increasing understanding and awareness of nutrition among the public. This research aims to analyze the effectiveness of health education methods in increasing public nutritional awareness. The method in this research uses a quantitative approach with a survey method involving various groups of people with social and educational backgrounds. The educational methods used consist of several methods with educational material about nutrition. Data was collected through questionnaires before and after the educational intervention was carried out. The results of this research show an increase in the level of public nutritional awareness after implementing health education methods. Respondents who took part in the education program showed better knowledge about nutritional value, healthy eating patterns, and their impact on health. Apart from that, participants also showed more positive behaviour regarding food choices and a healthy lifestyle. The conclusion of this research is that the health education method has proven to be effective in increasing public nutritional awareness. Implementing educational programs can influence people's knowledge, attitudes and behaviour regarding nutrition and health. This provides a strong basis for continuing to develop and improve health education efforts to create a society that is more aware of the importance of nutrition in maintaining health and well-being.

**Keywords:** *Community, Educational, Health*

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## **INTRODUCTION**

The importance of maintaining health cannot be ignored in life. Health is a valuable asset that affects the overall quality of life (Machleid et al., 2020). Maintaining health is not only about avoiding disease but also about creating optimal physical, mental and social conditions (Ahmad et al., 2016). By maintaining health, life will be more productive, happier and meaningful. More than just the absence of disease, good health makes it possible to carry out daily activities with high energy and enthusiasm, contribute positively to work and social relationships, and experience deep satisfaction and happiness. Therefore, it is important to understand how important it is to maintain health and take the necessary steps to care for the body, mind, and spirit. Maintaining health also has long-term implications for quality of life (Adunlin et al., 2015). By adopting a healthy lifestyle and constant attention to health, you can reduce the risk of developing various chronic diseases such as diabetes, heart disease, hypertension and cancer (Cerri et al., 2019). Preventive steps such as a balanced diet, regular exercise, stress management, adequate sleep, and avoiding consumption of harmful substances such as alcohol and tobacco can help maintain physical and mental health in the future.

## **Literatur of Refiew**

### **Use of Health Education Methods for the Community**

The health education method is an approach or strategy used to convey information and provide understanding to individuals or groups about relevant health issues (Tubelo et al., 2019). In the health context, education is an important pillar in efforts to prevent disease, promote health, and improve the quality of life of society as a whole. Health education methods can vary from direct counselling by health workers, distribution of written materials, and use of mass media to the use of information and communication technology such as social media and mobile applications (Di Malta et al., 2022). The aim of using health education methods is to provide knowledge, increase awareness, influence attitudes, and change individual or community behaviour regarding health. Health education methods are a very important tool in efforts to achieve various public health goals (García-Castejón et al., 2021). One of the main goals of using this method is to increase public health awareness. Health awareness is an individual or group's understanding of the importance of maintaining health and preventing disease (Surr et al., 2020). By increasing health awareness, individuals or communities become better able to recognize risk factors for disease and take the necessary preventive steps (Khurana et al., 2022). Health education methods also aim to provide accurate knowledge and in-depth understanding of various aspects of health (Akselbo et al., 2019), such as healthy eating patterns, the importance of physical activity, managing stress, using medicines wisely, and so on.

Apart from increasing awareness and knowledge, health education methods

also aim to influence individual or community attitudes towards health (Jo et al., 2019). A positive attitude towards health can help individuals or society to be more open to available health information and services and motivate them to adopt healthy behaviour. For example, by conveying inspiring information and providing positive support, health education methods can help individuals change their attitudes towards unhealthy lifestyles such as smoking, excessive alcohol consumption, or unhealthy eating habits (Seal et al., 2020). Furthermore, the aim of using health education methods is to change the behaviour of individuals or communities to make them healthier (Eost-Telling et al., 2021). Behavioural change is a crucial step in achieving better health outcomes and preventing the emergence of preventable diseases. For example, by providing education about the importance of a balanced diet and regular physical activity, health education methods can help individuals change unhealthy eating habits and inactive lifestyles to healthier ones (Sulaiman et al., 2021). Likewise, by providing information about the dangers of smoking and the benefits of quitting smoking, health education methods can help smokers decide and live a life without smoking.

### **The Importance of Nutrition Awareness for Society**

Public nutritional awareness is an important aspect of efforts to achieve optimal well-being and quality of life for a population (Azlan et al., 2020). Nutrition awareness refers to the level of understanding and awareness of an individual or group regarding the importance of nutrition in maintaining health and preventing disease (Kwan et al., 2019). In a global context characterized by unhealthy eating patterns, rapid urbanization, and the increasing prevalence of chronic diseases, public nutrition awareness is becoming increasingly relevant and urgent (Biberman-Shalev, 2021). In the rapidly developing digital information era, access to information about nutrition and health is increasingly easier. However, the level of public nutritional awareness is only sometimes in line with the availability of this information (Shahid et al., 2022). Many factors influence people's level of nutritional awareness (Auclair et al., 2019), ranging from education level, access to health services, and cultural and environmental influences to economic conditions (Lorenzoni et al., 2019). Therefore, understanding public nutritional awareness is key to designing and implementing effective and sustainable public health programs.

One important aspect of public nutritional awareness is understanding the importance of nutrition in supporting optimal growth and development, both in childhood and adulthood (Moretti et al., 1999). Adequate and balanced nutrition is the foundation for good health, a strong immune system and optimal productivity (Cawood et al., 2020). Awareness of the importance of choosing healthy and nutritious foods can help individuals or families avoid nutritional problems such as malnutrition or obesity, as well as related diseases such as diabetes, heart disease and cancer (Chen et al., 2022). Public nutritional awareness also includes an understanding of the important role of various specific nutrients in maintaining optimal body function and preventing disease (Estrada-Bonilla et al., 2021). For example, awareness of the

importance of fibre intake in preventing constipation and digestive diseases, calcium intake to maintain bone density and prevent osteoporosis, as well as intake of other essential vitamins and minerals from supporting the immune system and heart health (Bakhtiari et al., 2020).

Apart from physical health problems, public nutritional awareness is also related to mental health and emotional well-being. Proper nutrition not only affects body health, but also brain health and mood. Research has shown a link between a healthy diet and the risk of depression, anxiety, and other mood disorders. Therefore, increasing public nutritional awareness can also help reduce the burden of mental illness in society (Kalantar-Zadeh et al., 2023). In globalization and cultural transformation, public nutritional awareness has also become important in overcoming multiple nutritional problems (Zhu et al., 2019). Although there are still malnutrition problems in some areas, increasing urbanization and changes in dietary patterns have led to an increase in the prevalence of obesity and overnutrition problems (Wall et al., 2020). Public nutritional awareness needs to be increased not only to overcome the problem of malnutrition but also to change people's behaviour that contributes to the problem of excess nutrition.

There are several previous research opinions. The first research, according to Kumar et al. (2021), with the research titled *Impact of the COVID-19 Pandemic on Teaching and Learning in Health Professional Education: A Mixed Methods Study Protocol*. The results of his research stated that the COVID-19 pandemic has impacted many of these learning opportunities, especially those in large groups or those involved in in-person interaction with peers and patients. Much of the curriculum has been adapted to an online format, the long-term consequence of which is yet to be recognized. The changed format is likely to impact learning pedagogy, affecting both students and teachers. The second research, according to Van Der Vaart et al. (2019), with the research title *The Role of Age, Education, and Digital Health Literacy in the Usability of Internet-Based Cognitive Behavioral Therapy for Chronic Pain: Mixed Methods Study*. The results of his research stated that A total of 32 patients participated, with a mean age of 49.9 years and 84% (27/32) being female. All performance tasks except one (fill-in a diary registration) could be completed independently by more than 50% of the participants. On operational, navigation, and search levels, participants struggled most with logging in, logging out, and finding specific parts of the intervention. Half of the sample experienced problems evaluating the relevance and adding content to the program to some extent. Usability correlated moderately negatively with age and moderately positively with digital health literacy skills but not with educational level. The third research, according to Foo et al. (2019), with the research title *Cost Evaluations in Health Professions Education: A Systematic Review of Methods and Reporting Quality*. The results of his research stated that A total of 78 studies were included, of which 16 were published in 2001, 15 in 2006, 20 in 2011 and 27 in 2016. The region most commonly represented was the USA ( $n = 43$ ). The profession most commonly referred to was that of the physician ( $n = 46$ ). The

mean  $\pm$  standard deviation (SD) MERSQI score was  $10.9 \pm 2.6$  out of 18, with no significant change over time ( $p = 0.55$ ). The mean  $\pm$  SD BMJ score was  $13.5 \pm 7.1$  out of 35, with no significant change over time ( $p = 0.39$ ). A total of 49 (63%) studies stated a cost-related research question, 23 (29%) stated the type of cost evaluation used, and 31 (40%) described the method of estimating resource quantities and unit costs. A total of 16 studies compared two or more interventions and reported both cost and learning outcomes.

## **RESEARCH METHOD**

This research uses a quantitative approach with a pre-experimental design, specifically a one-group pretest-posttest design (Jung, 2019). This design was chosen because it allows researchers to measure changes before and after the educational intervention is carried out without a control group. The population of this study is people in certain areas who have a level of nutritional awareness that needs to be increased. Sampling was carried out using convenience sampling, with inclusion criteria being 18 years and over and willing to take part in a health education program. The variables that will be measured in this research include the independent variable, namely the health education method, and the dependent variable, namely the level of public nutritional awareness. Demographic factors such as age, gender, education, and socioeconomic status will also be recorded as control variables. The research instrument that will be used is a structured questionnaire consisting of two parts. The first section contains questions about the characteristics of the respondents and their initial knowledge regarding nutrition. The second part contains questions related to nutritional awareness after participating in the educational program. The validity and reliability of the instrument will be tested before data collection is carried out.

The steps that will be taken in this research are as follows: 1. Recruitment and selection of respondents according to the inclusion criteria. 2. Initial data collection through distributing questionnaires before educational interventions are carried out. 3. Develop health education programs that include counselling, workshops, and the distribution of educational materials about nutrition. 4. Implementation of educational programs during a certain period. 5. Data collection after the intervention is completed by distributing the same questionnaire to respondents. 6. Data analysis using appropriate statistical techniques to measure changes in nutritional awareness before and after the intervention. 6. After data analysis is complete, the final step is to compile the research findings into a final report (Chiang et al., 2014). This report will include a summary of research results, interpretation of findings, and recommendations for relevant policy and practice. The goal is to present research findings in a clear and structured way so that they can be used by health practitioners, researchers, and policymakers to improve future public health interventions.

During the research, research ethics will be adhered to by maintaining the confidentiality of respondent data, obtaining informed consent before data collection, and ensuring there is no physical or psychological risk of harm to participants.



Research ethics ensures that researchers are responsible for conducting research with integrity and objectivity, as well as respecting the rights and welfare of individuals involved in the study. It also includes aspects of privacy, security, and data protection, where researchers must ensure that the personal information of participants is kept confidential and is guaranteed safe. Research ethics also demands transparency in reporting research results and avoiding conflicts of interest that could affect the integrity and objectivity of research. By adhering to the principles of research ethics, researchers can ensure that their research makes a positive contribution to science and the welfare of society as a whole.

Limitations of this study include limited generalization due to the population being limited to certain areas, the use of a pre-experimental approach without a control group, as well as time and resource limitations that may affect the depth of the analysis. This research method is hoped to provide a deeper understanding of the effectiveness of health education methods in increasing public nutritional awareness. It is hoped that the results of this research can make a positive contribution to efforts to improve public health and welfare through preventive and educational approaches in the field of nutrition.

## **RESULTS AND DISCUSSION**

The importance of nutritional awareness in society is an increasingly urgent issue to be discussed amidst modern lifestyles that tend to be unhealthy. For this reason, efforts to increase public nutritional awareness are a need that cannot be ignored. One effective way to achieve this goal is through the use of appropriate and measurable health education methods (McInerney & Green-Thompson, 2020). The health education method is an approach specifically designed to convey health information to the public systematically. In the context of increasing nutritional awareness, this method can be used to provide knowledge about the importance of balanced nutrition, the negative impacts of unhealthy eating patterns, and practical ways to increase nutritional intake in everyday life. By understanding the importance of adequate and balanced nutrition, it is hoped that people can improve their quality of life and reduce the risk of disease caused by malnutrition.

One effective approach to using health education methods is through nutrition education campaigns at various levels, from the individual to the community level. Through this campaign activity, information about the importance of balanced nutrition can be conveyed thoroughly and easily understood by the public. Apart from that, outreach campaigns can also be an opportunity to provide concrete and practical examples of how to implement healthy eating patterns in everyday life, apart from outreach campaigns, health education methods can also be carried out through training and workshops on balanced nutrition. By actively involving the community in this activity, it is hoped that messages about the importance of balanced nutrition can be more easily received and understood. Apart from that, through training and workshops, people can also directly learn how to choose and cook healthy food, as well as how to prepare a balanced food menu according to their nutritional needs.

Apart from the direct approach, the use of mass media is also an effective method of increasing public nutrition awareness. By utilizing television, radio, internet and social media, information about the importance of balanced nutrition can be disseminated widely and quickly to the public. Educational content about balanced nutrition can also be packaged in an interesting and interactive way so that it is easier to attract people's attention and encourage them to pay attention and apply the information in their daily lives. Apart from mass media, collaboration with various parties such as the government, health institutions, NGOs and the private sector can also strengthen the effectiveness of health education methods in increasing public nutritional awareness ("Front Matter," 2022). By involving various parties, information about balanced nutrition can be delivered comprehensively and integrated into various aspects of people's lives. Apart from that, collaboration between parties can also expand the reach of messages about the importance of balanced nutrition so that they can be more effective in achieving the goal of increasing public nutritional awareness.

It is important to remember that increasing public nutritional awareness is a challenging task, but by using appropriate and measurable health education methods, this goal can be achieved gradually and sustainably. It is important to continue to evaluate and monitor the effectiveness of the methods used so that adjustments and improvements can be made so that messages about balanced nutrition can be delivered more effectively and can be accepted by the public. When analyzing the use of health education methods in increasing public nutritional awareness, it is important to note that factors such as culture, economics and the environment can also influence the effectiveness of the methods used. Therefore, it is important to adjust and customize health education methods according to the needs and characteristics of the target community. In this way, efforts to increase public nutritional awareness can be carried out more effectively and sustainably.

**Table 1:** Advantages and disadvantages of using several health education methods in public nutrition awareness

NO	Health Education Methods	Advantage	Deficiencies
1	Online Campaign	<ul style="list-style-type: none"><li>• Can reach people globally without geographical limitations.</li><li>• It can provide information that is interactive and easily accessible to the public.</li><li>• Technology such as animation, video, or educational games can be utilized to increase public attraction and involvement.</li></ul>	<ul style="list-style-type: none"><li>• Not everyone has access or the skills to use the internet well.</li><li>• Vulnerable to network disruptions or other technical problems that could hinder public access to information.</li><li>• It is difficult to ensure that the information provided online can be understood and implemented well by the public.</li></ul>

2	Social media	<ul style="list-style-type: none"><li>• It can reach a wide audience, especially young people who actively use social media.</li><li>• Enables two-way interaction between information providers and the public, thereby facilitating discussion and exchange of information.</li><li>• Can use visual content and interesting stories to increase public attraction and engagement.</li></ul>	<ul style="list-style-type: none"><li>• Not all community groups have access to or the ability to use social media.</li><li>• It is difficult to control and measure the impact of information spread via social media.</li><li>• Vulnerable to the dissemination of invalid or inaccurate information by irresponsible parties.</li></ul>
3	Media Mass	<ul style="list-style-type: none"><li>• Can reach a wide audience in a short time.</li><li>• Can use various creative formats to attract people's attention.</li><li>• Can be integrated with public campaigns to increase nutrition awareness.</li></ul>	<ul style="list-style-type: none"><li>• Only some have access to mass media.</li><li>• Production and deployment costs can be expensive depending on the scale and scope of the campaign.</li><li>• It is difficult to assess the level of public understanding and response to the information presented.</li></ul>

From the table above, it can be seen that each health education method has advantages and disadvantages that need to be considered when designing strategies to increase public nutritional awareness. A combination or integration of several different methods may be needed to achieve optimal results in increasing nutritional awareness and healthy public behaviour. Careful evaluation of the effectiveness and efficiency of each method is also important to ensure appropriate resource allocation and maximum results in efforts to improve public health.

To get results regarding the use of health education methods in public nutrition awareness, the researchers created a questionnaire containing ten statements. The purpose of making a questionnaire is to collect data systematically from respondents to answer research questions or evaluate a certain phenomenon. A good questionnaire must be designed carefully to ensure that the questions asked are relevant to the research objectives and can produce accurate and meaningful data. Criteria that a good questionnaire must meet include clarity and simplicity of questions, diversity and relevance of the answers provided, and accuracy and consistency in the use of language. In addition, a good questionnaire must also consider ethical aspects of research, such as maintaining respondents' privacy and anonymity and avoiding questions that could cause confusion or discomfort. After the questionnaire is completed, it will be distributed to various groups of society. The questionnaire was created via Google Forms. Once completed, the questionnaire is distributed online to the public.



**Table 2:** Results of filling out a questionnaire regarding the use of health education methods in increasing public nutritional awareness.

Information:

SD = Strongly Disagree

D= Disagree

A= Agree

SA = Strongly Agree

NO	Statement	Assessment			
		Strongly Agree	Agree	Disagree	Strongly Disagree
1	I feel that an effective method is one that can increase people's nutritional awareness.	66,7%	33,3%		
2	In my opinion, distributing brochures and templates is an effective way to disseminate nutritional information to the public.	33,3%	66,7%		
3	In my opinion, mass media such as television and radio are the main sources of nutritional information for society.	66,7%	33,3%		
4	In my opinion, looking for nutritional health information through social media platforms such as Facebook or Instagram is one step towards improving nutritional health.	66,7%	33,3%		
5	I feel encouraged to take part in health and nutrition campaigns that are held online because they are effective and efficient.	66,7%	33,3%		
6	I feel more aware of the importance of maintaining and improving nutritional health after receiving health education.	66,7%	33,3%		
7	I have changed my eating behaviour after receiving nutritional health education.	33,3%	66,7%		
8	I feel I pay more attention to the nutritional content of my daily food after receiving health education.	66,7%	33,3%		
9	I feel that participating in nutritional	66,7%	33,3%		

	health education has encouraged me to understand how important nutritional health is.				
<b>10</b>	I feel that participating in nutritional health education has encouraged me to understand how important nutritional health is.	66,7%	33,3%		

After collecting data from this questionnaire, the conclusions that can be drawn are as follows: 1. Shows which method respondents prefer or consider more effective in increasing nutritional awareness. 2. By evaluating how often respondents search for nutritional information and whether they feel more aware of the importance of nutrition after receiving education, we can assess the level of public nutritional awareness. 3. Most respondents reported that they had changed their eating behaviour or paid more attention to the nutritional content of food after receiving health education; this shows the positive impact of the education program. On average, respondents answered, agreeing that appropriate health education methods can improve nutritional health for the community.

The first statement, namely, I feel that an effective method is one that can increase people's nutritional awareness, received responses with the assessment categories strongly agree 66,7 % and agreed 33,3%. The second statement, namely, In my opinion, distributing brochures and templates is an effective way to disseminate nutritional information to the public, received responses with the assessment categories strongly agree 33,3% and agreed 66,7%. The third statement, namely, In my opinion, mass media such as television and radio are the main sources of nutritional information for society, received responses with the assessment categories strongly agree 66,7% and agree 33,3%. The fourth statement, namely, In my opinion, looking for nutritional health information through social media platforms such as Facebook or Instagram is one step for society to improve nutritional health, received responses with the assessment categories strongly agree on v and agreed 33,3%. The fifth statement, namely I feel encouraged to take part in health and nutrition campaigns that are held online because they are effective and efficient, received responses with the assessment categories strongly agree 66,7% and agree 33,3%.

The sixth statement, namely I feel more aware of the importance of maintaining and improving nutritional health after receiving health education, received responses with the assessment categories strongly agree 66,7% and agree 33,3%. The seventh statement, namely I have changed my eating behaviour after receiving nutritional health education, received responses with the assessment categories strongly agree 33,3% and agree 66,7%. The eighth statement, namely I feel I pay more attention to the nutritional content of my daily food after receiving health education, received responses with the assessment categories strongly agree 66,7% and agree 33,3%. The ninth statement, namely I feel that participating in nutritional health education has encouraged me how important nutritional health is, received responses in the categories of strongly agree 66,7% and agree 33,3%. The tenth statement, namely, I feel that participating in nutritional health education has

encouraged me to understand how important nutritional health is, received responses with the assessment categories strongly agreeing at 66,7% and agreeing at 33,3%.

## CONCLUSIONS

Based on the results and discussion above, it can be concluded that this is an effective strategy for increasing public nutritional awareness. Through a systematic and measurable approach, information about the importance of balanced nutrition can be conveyed comprehensively and easily understood by the public. By involving various parties and utilizing various media, messages about balanced nutrition can be spread widely and quickly to the public. Health education methods are very important in efforts to increase awareness, knowledge, attitudes and health behaviour of individuals or communities. The goal of using this method is to bring about positive changes in health behaviour and achieve better overall health outcomes. In public health, the use of health education methods is also key in achieving various strategic goals to improve the quality of life and overall welfare of society. In this way, it is hoped that an increase in public nutritional awareness can be achieved so that people can live a healthier and better quality of life.

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## REFERENCES

- Adunlin, G., Diaby, V., & Xiao, H. (2015). Application of multicriteria decision analysis in health care: A systematic review and bibliometric analysis. *Health Expectations*, 18(6), 1894–1905. <https://doi.org/10.1111/hex.12287>
- Ahmad, M., Amin, M. B., Hussain, S., Kang, B. H., Cheong, T., & Lee, S. (2016). Health Fog: A novel framework for health and wellness applications. *The Journal of Supercomputing*, 72(10), 3677–3695. <https://doi.org/10.1007/s11227-016-1634-x>
- Akselbo, I., Olufsen, V., Ingebrigtsen, O., & Aune, I. (2019). Simulation as a learning method in public health nurse education. *Public Health Nursing*, 36(2), 226–232. <https://doi.org/10.1111/phn.12560>
- Auclair, Han, & Burgos. (2019). Consumption of Milk and Alternatives and Their Contribution to Nutrient Intakes among Canadian Adults: Evidence from the 2015 Canadian Community Health Survey—Nutrition. *Nutrients*, 11(8), 1948. <https://doi.org/10.3390/nu11081948>
- Azlan, A. A., Hamzah, M. R., Sern, T. J., Ayub, S. H., & Mohamad, E. (2020). Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. *PLOS ONE*, 15(5), e0233668. <https://doi.org/10.1371/journal.pone.0233668>

- Bakhtiari, A., Pourali, M., & Omidvar, S. (2020). Nutrition assessment and geriatric associated conditions among community-dwelling Iranian elderly people. *BMC Geriatrics*, 20(1), 278. <https://doi.org/10.1186/s12877-020-01668-8>
- Biberman-Shalev, L. (2021). Motivational factors for learning and teaching global education. *Teaching and Teacher Education*, 106, 103460. <https://doi.org/10.1016/j.tate.2021.103460>
- Cawood, A. L., Walters, E. R., Smith, T. R., Sipaul, R. H., & Stratton, R. J. (2020). A Review of Nutrition Support Guidelines for Individuals with or Recovering from COVID-19 in the Community. *Nutrients*, 12(11), 3230. <https://doi.org/10.3390/nu12113230>
- Cerri, S., Mus, L., & Blandini, F. (2019). Parkinson's Disease in Women and Men: What is the Difference? *Journal of Parkinson's Disease*, 9(3), 501–515. <https://doi.org/10.3233/JPD-191683>
- Chen, L., Arai, H., Assantachai, P., Akishita, M., Chew, S. T. H., Dumlao, L. C., Duque, G., & Woo, J. (2022). Roles of nutrition in muscle health of community-dwelling older adults: Evidence-based expert consensus from Asian Working Group for Sarcopenia. *Journal of Cachexia, Sarcopenia and Muscle*, 13(3), 1653–1672. <https://doi.org/10.1002/jcsm.12981>
- Chiang, J.-H., Yang, P.-C., & Tu, H. (2014). Pattern analysis in daily physical activity data for personal health management. *Pervasive and Mobile Computing*, 13, 13–25. <https://doi.org/10.1016/j.pmcj.2013.12.003>
- Di Malta, G., Bond, J., Conroy, D., Smith, K., & Moller, N. (2022). Distance education students' mental health, connectedness and academic performance during COVID-19: A mixed-methods study. *Distance Education*, 43(1), 97–118. <https://doi.org/10.1080/01587919.2022.2029352>
- Eost-Telling, C., Kingston, P., Taylor, L., & Emmerson, L. (2021). Ageing simulation in health and social care education: A mixed methods systematic review. *Journal of Advanced Nursing*, 77(1), 23–46. <https://doi.org/10.1111/jan.14577>
- Estrada-Bonilla, G. A., Durrer, A., & Cardoso, E. J. B. N. (2021). The use of compost and phosphate-solubilizing bacteria affects sugarcane mineral nutrition, phosphorus availability, and the soil bacterial community. *Applied Soil Ecology*, 157, 103760. <https://doi.org/10.1016/j.apsoil.2020.103760>
- Foo, J., Cook, D. A., Walsh, K., Golub, R., Abdalla, M. E., Ilic, D., & Maloney, S. (2019). Cost evaluations in health professions education: A systematic review of methods and reporting quality. *Medical Education*, 53(12), 1196–1208. <https://doi.org/10.1111/medu.13936>
- Front matter. (2022). In *Survey Methods for Medical and Health Professions Education* (pp. i–iii). Elsevier. <https://doi.org/10.1016/B978-0-323-69591-6.00015-1>
- García-Castejón, G., Camerino, O., Castañer, M., Manzano-Sánchez, D., Jiménez-Parra, J. F., & Valero-Valenzuela, A. (2021). Implementation of a Hybrid Educational Program between the Model of Personal and Social Responsibility (TPSR) and the Teaching Games for Understanding (TGfU) in Physical Education and Its Effects on Health: An Approach Based on Mixed Methods. *Children*, 8(7), 573. <https://doi.org/10.3390/children8070573>
- Jo, M.-W., Seo, W., Lim, S. Y., & Ock, M. (2019). The Trends in Health Life Expectancy in Korea according to Age, Gender, Education Level, and Subregion: Using Quality-Adjusted Life Expectancy Method. *Journal of Korean Medical Science*, 34(Suppl 1), e88. <https://doi.org/10.3346/jkms.2019.34.e88>

- Jung, Y. M. (2019). Data Analysis in Quantitative Research. In P. Liamputtong (Ed.), *Handbook of Research Methods in Health Social Sciences* (pp. 955–969). Springer Singapore. [https://doi.org/10.1007/978-981-10-5251-4\\_109](https://doi.org/10.1007/978-981-10-5251-4_109)
- Kalantar-Zadeh, K., Bross, R., Wang, C., & Moore, L. W. (2023). Community Nutrition and Lifestyle Medicine for Kidney Health: Awareness of the Social Determinants of Health in Renal Nutrition. *Journal of Renal Nutrition*, 33(4), 505–507. <https://doi.org/10.1053/j.jrn.2023.05.003>
- Khurana, M. P., Raaschou-Pedersen, D. E., Kurtzhals, J., Bardram, J. E., Ostrowski, S. R., & Bundgaard, J. S. (2022). Digital health competencies in medical school education: A scoping review and Delphi method study. *BMC Medical Education*, 22(1), 129. <https://doi.org/10.1186/s12909-022-03163-7>
- Kumar, A., Sarkar, M., Davis, E., Morphet, J., Maloney, S., Ilic, D., & Palermo, C. (2021). Impact of the COVID-19 pandemic on teaching and learning in health professional education: A mixed methods study protocol. *BMC Medical Education*, 21(1), 439. <https://doi.org/10.1186/s12909-021-02871-w>
- Kwan, R. Y. C., Leung, A. Y. M., Yee, A., Lau, L. T., Xu, X. Y., & Dai, D. L. K. (2019). Cognitive Frailty and Its Association with Nutrition and Depression in Community-Dwelling Older People. *The Journal of Nutrition, Health and Aging*, 23(10), 943–948. <https://doi.org/10.1007/s12603-019-1258-y>
- Lorenzoni, G., Azzolina, D., Baldas, S., Messi, G., Lanera, C., French, M. A., Da Dalt, L., & Gregori, D. (2019). Increasing awareness of food-choking and nutrition in children through education of caregivers: The CHOP community intervention trial study protocol. *BMC Public Health*, 19(1), 1156. <https://doi.org/10.1186/s12889-019-7469-7>
- Machleid, F., Kaczmarczyk, R., Johann, D., Balčiūnas, J., Atienza-Carbonell, B., Von Maltzahn, F., & Mosch, L. (2020). Perceptions of Digital Health Education Among European Medical Students: Mixed Methods Survey. *Journal of Medical Internet Research*, 22(8), e19827. <https://doi.org/10.2196/19827>
- McInerney, P., & Green-Thompson, L. P. (2020). Theories of learning and teaching methods used in postgraduate education in the health sciences: A scoping review. *JBIS Evidence Synthesis*, 18(1), 1–29. <https://doi.org/10.11124/JBISIR-D-18-00022>
- Moretti, C., Gizzi, C., Papoff, P., Lampariello, S., Capoferri, M., Calcagnini, G., & Bucci, G. (1999). Comparing the effects of nasal synchronized intermittent positive pressure ventilation (nSIPPV) and nasal continuous positive airway pressure (nCPAP) after extubation in very low birth weight infants. *Early Human Development*, 56(2–3), 167–177. [https://doi.org/10.1016/S0378-3782\(99\)00046-8](https://doi.org/10.1016/S0378-3782(99)00046-8)
- Seal, K. H., Becker, W. C., Murphy, J. L., Purcell, N., Dennison, L. M., Morasco, B. J., Martin, A. M., Reddy, K., Iseghem, T. V., Krebs, E. E., Painter, J. M., Hagedorn, H., Pyne, J. M., Hixon, J., Maguen, S., Neylan, T. C., Borsari, B., DeRonne, B., Gibson, C., ... McCamish, N. (2020). Whole Health Options and Pain Education (wHOPE): A Pragmatic Trial Comparing Whole Health Team vs Primary Care Group Education to Promote Nonpharmacological Strategies to Improve Pain, Functioning, and Quality of Life in Veterans—Rationale, Methods, and Implementation. *Pain Medicine*, 21(Supplement\_2), S91–S99. <https://doi.org/10.1093/pm/pnaa366>

- Shahid, M., Cao, Y., Ahmed, F., Raza, S., Guo, J., Malik, N. I., Rauf, U., Qureshi, M. G., Saheed, R., & Maryam, R. (2022). Does Mothers' Awareness of Health and Nutrition Matter? A Case Study of Child Malnutrition in Marginalized Rural Community of Punjab, Pakistan. *Frontiers in Public Health*, p. 10, 792164. <https://doi.org/10.3389/fpubh.2022.792164>
- Sulaiman, N., Rishmawy, Y., Hussein, A., Saber-Ayad, M., Alzubaidi, H., Al Kawas, S., Hasan, H., & Guraya, S. Y. (2021). A mixed methods approach to determine the climate of interprofessional education among medical and health sciences students. *BMC Medical Education*, 21(1), 203. <https://doi.org/10.1186/s12909-021-02645-4>
- Surr, C. A., Parveen, S., Smith, S. J., Drury, M., Sass, C., Burden, S., & Oyeboode, J. (2020). The barriers and facilitators to implementing dementia education and training in health and social care services: A mixed-methods study. *BMC Health Services Research*, 20(1), 512. <https://doi.org/10.1186/s12913-020-05382-4>
- Tubelo, R. A., Portella, F. F., Gelain, M. A., De Oliveira, M. M. C., De Oliveira, A. E. F., Dahmer, A., & Pinto, M. E. B. (2019). Serious game is an effective learning method for primary health care education of medical students: A randomized controlled trial. *International Journal of Medical Informatics*, 130, 103944. <https://doi.org/10.1016/j.ijmedinf.2019.08.004>
- Van Der Vaart, R., Van Driel, D., Pronk, K., Paulussen, S., Te Boekhorst, S., Rosmalen, J. G. M., & Evers, A. W. M. (2019). The Role of Age, Education, and Digital Health Literacy in the Usability of Internet-Based Cognitive Behavioral Therapy for Chronic Pain: Mixed Methods Study. *JMIR Formative Research*, 3(4), e12883. <https://doi.org/10.2196/12883>
- Wall, C. B., Kaluhiokalani, M., Popp, B. N., Donahue, M. J., & Gates, R. D. (2020). Divergent symbiont communities determine the physiology and nutrition of a reef coral across a light-availability gradient. *The ISME Journal*, 14(4), 945–958. <https://doi.org/10.1038/s41396-019-0570-1>
- Zhu, L.-Y., Chan, R., Kwok, T., Cheng, K. C.-C., Ha, A., & Woo, J. (2019). Effects of exercise and nutrition supplementation in community-dwelling older Chinese people with sarcopenia: A randomized controlled trial. *Age and Ageing*, 48(2), 220–228. <https://doi.org/10.1093/ageing/afy179>

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