



# Effectiveness of Health Education on Fish Consumption Behavior in Populations at Risk of Coronary Heart Disease

Lilik Subagiyo Utomo<sup>1</sup>, Beti Kristinawati<sup>2\*</sup>

<sup>1</sup>Nursing Student, Faculty of Health Sciences, Universitas Muhammadiyah Surakarta

<sup>2</sup>Department of Medical Surgical Nursing, Faculty of Health Sciences, Universitas Muhammadiyah Surakarta

Email correspondence : [bk115@ums.ac.id](mailto:bk115@ums.ac.id)

<p><b>Track Record Article</b></p> <p>Accepted: 27 December 2023 Revised: 07 February 2024 Published: 11 March 2024</p> <p><b>How to cite :</b> Utomo, L. S., &amp; Kristinawati, B. (2024). Effectiveness of Health Education on Fish Consumption Behavior in Populations at Risk of Coronary Heart Disease. <i>Contagion : Scientific Periodical of Public Health and Coastal Health</i>, 6(1), 180-189.</p>	<p style="text-align: center;"><b>Abstract</b></p> <p><i>Health education is important for people to know and want to prevent coronary heart disease by consuming fish. Fish is an animal that produces omega-3 to prevent coronary heart disease by reducing low-density lipoprotein, which causes plaque buildup on blood vessel walls. Coronary heart disease is caused by a blockage in the walls of blood vessels, preventing blood from reaching the heart. This research aims to increase public knowledge about fish consumption behaviour in populations at risk of coronary heart disease through health education in Nganjat Village, Polanharjo District, Klaten Regency. The research method used is quantitative research, using a Quasi Experiment type and research design with a "One group pre-test post-test" research design. This research was carried out in October – November 2023 in Nganjat Village. The sample used was 50 respondents using a total sampling technique. The data collection technique used a pretest and posttest questionnaire totaling 10 questions to determine fish consumption behavior before and after being given health education. Data analysis used the Wilcoxon test which was processed using SPSS software. The study's results showed an influence of providing health education on fish consumption behavior in populations at risk of coronary heart disease (p-value = 0.000). It is recommended that health workers provide interactive and interactive information in the form of health promotion, useful educational media, and measure the impact of health education with a comprehensive evaluation of changes in fish consumption behavior in populations at risk of coronary heart disease.</i></p> <p><b>Keywords:</b> <i>Behavior, Coronary Heart Disease, Fish Consumption, Health Education</i></p>
--	--

## INTRODUCTION

Coronary heart disease is a non-communicable disease and causes number 1 death in the world (Naomi et al., 2021). Coronary heart disease is caused by the deposition of plasma lipoproteins and the proliferation of cellular elements in the arterial walls (Santosa et al., 2020). Coronary heart disease occurs due to narrowing or blockage in the vein walls due to fat and cholesterol deposits, obstructing the blood supply (Lissa et al., 2019).

Based on data from the World Health Organization (WHO), cardiovascular disease is the number 1 deadly disease in the world. In 2019, the prevalence of coronary heart disease in the world was 2 million and increased to 8.9 million deaths worldwide due to coronary heart disease. The prevalence of cardiovascular disease in 2022 was recorded at 17.9 million deaths (WHO, 2020; WHO, 2022).

The prevalence of coronary heart disease sufferers in Indonesia, according to basic health research in 2018, explains that coronary heart disease sufferers in Indonesia reached 1.5% of the total population in Indonesia or 1.017.290 people (Kemenkes RI, 2018). Based on 2018

Basic Health Research data, the prevalence of heart disease in Central Java Province is 1.56%. According to an interview with the village midwife, in Nganjat Village 987 people are living in Nganjat Village and according to the village midwife, the prevalence of coronary heart disease sufferers in Nganjat Village is 15 people and is dominated by those aged 45-65 years and the most people suffering from coronary heart disease are male, therefore the high number of coronary heart disease sufferers in Nganjat Village is caused by several risk factors, namely genetic factors, age factors, smoking factors, diet factors and others.

Risk factors for coronary heart disease can be divided into two, including risk factors that cannot be controlled and those that can be controlled. Risk factors for coronary heart disease that cannot be controlled include age, gender and genetics. Meanwhile, risk factors for coronary heart disease that can be controlled include smoking, obesity, diabetes mellitus, stress, alcohol consumption and inappropriate dietary habits (Naomi et al., 2021).

According to research experts, one of the factors that causes coronary heart disease is age, stating that the prevalence of coronary heart disease continues to increase as a person gets older (Murfat, 2022). The same research also states that one of the causes of coronary heart disease that can be controlled is by using a proper diet. Diet is one of the risk factors that can be modified properly if patients suffering from coronary heart disease continue to be required to regulate the right diet to prevent recurrent attacks and to prevent their return to hospital (Letualy et al., 2022).

Dietary regulation is one of the risk factors associated with coronary heart disease. Dietary compliance in patients suffering from coronary heart disease is a form of self-prevention against coronary heart disease. For this reason, it is necessary to have an appropriate diet, such as consuming calories, protein, saturated fat, and unsaturated fat according to the body's needs (Letualy et al., 2022).

One of the dietary habits of people with coronary heart disease is consuming fish. According to previous researchers, fish is very beneficial for health because it is rich in various substances that are good for heart health, one of the substances contained in fish is omega-3. Therefore, the omega-3 fatty acids contained in fish can improve the function of the endothelium or lining of the heart, vitamin B complex and the anti-oxidant astaxanthin can reduce levels of bad cholesterol which can cause plaque buildup on the walls of the blood vessels of the heart and increase levels of good cholesterol which functions to reduce bad cholesterol levels, maintains the flexibility of veins and arteries, strengthens the heart muscle and lowers blood pressure (Aryanta, 2023). Indonesia has a very high fishery resource potential. However, the level of public consumption of fish still needs to be higher in Bandig,

with the consumption of beef and chicken as a source of protein compared to fish (Soparue, 2021).

Education is an intervention with a process to improve skills and aims to increase knowledge about health in the community with the aim of the community knowing, wanting, and being able to adopt a healthy lifestyle (Purnama, 2020). Providing education in the form of counselling to the public can benefit public understanding and awareness of the importance of preventing coronary heart disease (Indahsari et al., 2022).

Based on a preliminary survey conducted in the Polanharjo health centre working area, the problem that occurs is that many people suffer from coronary heart disease, reaching 50 people out of 1000 residents in the village. The number of people who live in Nganjat Village is 987 residents; 15 residents suffer from coronary heart disease, and as many as 50 people are at risk of coronary heart disease. Lack of knowledge on how to prevent heart disease and how to recognize the symptoms of heart disease is a contributing factor to the high rate of coronary heart disease. This is because many people do not know how to prevent heart disease and how to utilize the results of fish farming in the village to support health in the community.

Based on this background, researchers are interested in researching education on fish consumption behaviour in populations at risk of coronary heart disease. This research aims to determine people's behaviour towards fish consumption in populations at risk of coronary heart disease.

## **METHODS**

This research uses quantitative research methods with a research design with a one group design pre-test post-test plan. The instrument in this study was a questionnaire to measure knowledge about fish consumption behaviour in populations at risk of coronary heart disease. Respondents filled out a pre-test questionnaire after participating in intervention training on correct and appropriate fish consumption behavior, after which they were monitored for 30 days and continued to fill out the post-test.

This study's data was taken from an area in Nganjat Village, the working area of the Polanharjo Health Center, Klaten Regency, from August to November 2023. This study's population was residents at risk of coronary heart disease in Nganjat Village in 2023. Samples were taken according to predetermined criteria, including: people who have a history of hypertension, people who have a history of diabetes mellitus, and people who have a history of cholesterol. The sampling technique used in this research used a total sampling technique.

The number of samples involved in this research was 50 people. People willing to participate in the research series must sign an informed consent letter.

The instrument used in this research was a questionnaire containing fish consumption behaviour in populations at risk of coronary heart disease. The questionnaire in this study was used as a measuring tool to determine changes in respondents' fish consumption behavior. The questionnaire contains 10 question items. If the answer is correct, you will get a score of 1; if the answer is wrong, you will get a score of 0. To determine the knowledge scale, it is said to be high with a score of 8-10, medium with a score of 6-7 and low 0-5.

Based on the validity test of 10 items, it was found that the person correlation value was greater than 0.30 and the significant value was  $<0.05$ , so it could be concluded that this statement item was declared valid. Based on the reliability test, a Cronbach's alpha value of 0.771 was obtained, greater than 0.000, making it possible to conduct research.

The educational program in this research is presented as health education to encourage people to change their fish consumption behaviour and prevent coronary heart disease. In health education, there are several interventions: the benefits of consuming fish, how to process fish, how to serve fish, and how to prevent coronary heart disease. The researchers then conducted a pre-test and health education on fish consumption behavior in populations at risk of coronary heart disease, after which the researchers gave a post-test questionnaire.

Data analysis in this study used the Wilcoxon test to determine people's behaviour towards fish consumption in populations at risk of coronary heart disease. Processing research data uses a computer with SPSS version software and 2016 software for Windows.

## **RESULTS**

### **Respondent Characteristics**

This research collected data from 14 October to 14 November 2023 in Nganjat Village, the working area of the Polanharjo Klaten Community Health Center. The respondents in this research were 50 respondents from community members. Based on characteristics in terms of age, gender, education, occupation, marital status and history of illness, the following research results were obtained:

**Table 1. Characteristics of respondents based on age, gender, education, employment, marital status, history of illness (n=50)**

<b>Respondent characteristics</b>	<b>n</b>	<b>%</b>
<b>Age (year)</b>		
20-30	8	16
31-40	10	20
41-50	17	34
51-60	13	26
51-70	2	4
<b>Gender</b>		
Man	43	86
Woman	7	14
<b>Education</b>		
Elementary School	5	10
Junior High School	10	20
Senior High School	27	54
Diploma	5	10
Bachelor	3	6
<b>Work</b>		
Homemaker	29	58
Farmer	2	4
Trader	5	10
Civil servants	2	4
Village Apparatus	4	8
Student	5	10
Employee	2	4
Breeder	1	2
<b>Marital status</b>		
Marry	41	82
Widow	3	6
Not married yet	6	12
<b>Disease History</b>		
Hypertension	23	46
Diabetes mellitus	16	32
Cholesterol	11	22

Based on Table 1, it can be seen that the characteristics of the respondents who took part in this research were as follows: in terms of age, the majority of respondents were aged 41-50, namely 17 respondents (34%), while in terms of gender, the majority were women, namely as many as 43 respondents (86%), while from educational history the most were high school, namely 27 respondents (54%), while from occupation the most were homemakers, namely 29 respondents (58%), while from marital status the most were married, namely as many as 41 respondents (82%), and the most common medical history was hypertension as many as 23 respondents (46%).

## Normality test

Normality testing used the one group design pretest posttest statistical test method. The normality test in this study uses the Kolmogrov-Smirnov test (KS test), which is a nonparametric test of continuous equations. This one-dimensional probability distribution can be used to compare a sample with a reference probability distribution or compare 2 samples (Quraish, 2022). To find out whether the data is normally distributed or not, it can be seen from the significant  $> 0.05$  then it is normally distributed. If significant  $< 0.05$  then the data is not normally distributed.

**Table 2. Data normality test on the influence of education on fish consumption behaviour in populations at risk of coronary heart disease**

Group	Sig	Information
Pretest education on fish consumption behaviour	0.016	Not normally
Posttest education on fish consumption behaviour	0.000	Not normally

From the results of the Kolmogrov-Smirnov data normality test above, it can be seen that the value of the significant pretest is 0.016 ( $0.016 < 0.05$ ), and the significant posttest is 0.000 ( $0.000 < 0.05$ ). So, it can be concluded that the data tested is not normally distributed, so it must be tested using the Wilcoxon test.

## Levels of Fish Consumption Behavior

This research provides results in the form of a description of the level of community behaviour in consuming fish before and after being given educational interventions on fish consumption in health education. The following are the results of behavioural levels before and after being given health education in the form of fish consumption education:

**Table 3. Average distribution before and after being given fish consumption behaviour intervention with presentation media to prevent coronary heart disease**

Average behavior	n	Min	Max	Mean	SD
Before Intervention is Given	50	5	9	7.50	0.953
After Being Given an Intervention	50	9	10	9.98	0.141

Based on Table 3. Above the results of the pretest intervention on fish consumption behaviour in the community to prevent coronary heart disease, the highest score was 9, and the lowest score was 5. The posttest results of the fish consumption behavior intervention in the community to prevent coronary heart disease were obtained with the highest score being 10 and the highest score was 10. lowest 9.

**Table 4. Distribution of health education knowledge on fish consumption behaviour in populations at risk of coronary heart disease using PowerPoint presentations (n=50)**

Knowledge level	Pre-Intervention		Post-Test	
	n	%	n	%
Tall	26	52	50	100
Currently	23	46	0	0
Low	1	2	0	0

Based on Table 4. the univariate test above, a very significant value was obtained from the pretest and posttest, there was a difference in the good value of 48% after the intervention.

**Table 5. The effect of providing health education on fish consumption behavior in populations at risk of coronary heart disease (n=50)**

Variable	Rank	Frequency	Mean Rank	Sum Rank	Asym. Sig
Pretest-Posttest	Negative	0			
General Quality of Life	Positive	50	.00	.00	
	Ties	0	25.50	1275.00	,000
	Total	50			

Based on the Wilcoxon test above, the significance value obtained was 0.000 ( $p < 0.05$ ). Thus, it can be concluded that health education influences fish consumption behavior in populations at risk of coronary heart disease in Nganjat Village, the Polanharjo Community Health Center working area.

## DISCUSSION

### Effectiveness of Health Education on Fish Consumption Behavior

Education or counseling is a way to convey information to increase knowledge which in turn can obtain behavioral changes that support efforts to improve the quality of health (Sukesi et al., 2020; Araújo-Soares et al., 2019). The research results show that community knowledge before the knowledge intervention was still poor with a value of 7.50 and increased after being given the knowledge intervention to very good with a value of 9.98. Increased knowledge is influenced by the information obtained. Based on the results of this study, shows that there is an influence of health education on fish consumption behaviour in the population at risk of coronary heart disease in Nganjat Village, the Polanharjo Health Center working area ( $p$ -value=0.000).

Nutrition promotion is an activity or effort to deliver nutrition and health messages to communities, groups or individuals. It is expected that with the message, the community, group or individual can learn about nutrition and better health (Prameswari, 2018; Indriyani et al., 2020). Strategies in providing education to increase community knowledge can be done in

various ways, both direct and indirect counselling, and individual or family, small groups or large groups (Dewi, 2020; WHO, 2012).

Previous studies state that fish is a food that contains more protein than beef and chicken. Fish is one of the best producers of fatty acids, omega-3, which is unavailable in animals that live on land (Inara, 2020). Omega-3 can reduce the occurrence of coronary heart disease because omega-3 contained in fish can improve the function of endothelium or heart coating, omega-3 can reduce bad fat levels and increase good fat levels, and omega-3 plays an important role in reducing inflammation and preventing the buildup of plaque in the walls of the heart blood vessels (Aryanta, 2023).

Providing health education has the main objective of changing behaviour by improving knowledge such as cognition, attitudes, and practices in gaining access to health information, using information so that it can be used to improve or maintain their health. In addition, one of the factors in forming a person's attitude is social communication in the form of information received by the individual (Hawari Maharudin, 2021). Education or counselling is a way to convey information to increase knowledge, which in turn can lead to behavioural changes that support efforts to improve the quality of health (Sudayasa et al., 2021).

The information provided by health workers in the form of health education affects improving health (Rini Kundaryanti 2022). Based on the research results obtained from the Wilcoxon statistical test, the average pretest and posttest values were 7.50 and 9.98, which produced a  $p$ -value = 0.000, which means the hypothesis is accepted or can be interpreted as saying that health education using PowerPoint presentation media is effective in increasing public knowledge about consumption behaviour fish. The increase in the average value of public knowledge before health education was carried out and after health education was carried out was 48%.

This health education is in line with the theory put forward by Nuraeni et al. (2023), which explains that health education is an activity implemented to modify an individual's perspective, attitudes, and behaviour towards a healthier lifestyle. This is proven by the good response from respondents when the health education process was carried out through PowerPoint presentations, supported by the information in PowerPoint which was interesting and varied because it explained correct and good fish consumption behavior so that it could result in increased knowledge. According to previous research, it is clear that education regarding self-care management for people with coronary heart disease is very important because self-care management can independently manage the disease they suffer from (Kristinawati et al., 2023).



This study concludes that health education is effective in fish consumption behaviour in the coronary heart disease risk population. Public interest in health education can increase public knowledge about the prevention of coronary heart disease. Based on the results mentioned in this study, each element that is the object and subject of this research is interrelated. Therefore, the increase in knowledge in this study can be influenced by its relationship with education so that people can be more informed and able to know how to prevent coronary heart disease, one of which is the correct and appropriate fish consumption behaviour.

## CONCLUSIONS

After carrying out health education on fish consumption behaviour in Nganjat Village, the working area of the Polanharjo Klaten Community Health Center, there was significant effectiveness in the population at risk of coronary heart disease and it could be a way to prevent coronary heart disease. Hopefully, this research can become a reference and develop research on fish consumption behaviour to prevent coronary heart disease. It is also necessary to carry out promotional activities for eating fish in other regions or areas in order to increase public awareness to consuming fish in a daily manner so that the level of public fish consumption in general can be better.

## REFERENCE

- Araújo-Soares, V., Hankonen, N., Pesseau, J., Rodrigues, A., & Sniehotta, F. F. (2019). Developing Behavior Change Interventions for Self-Management in Chronic Illness: An Integrative Overview. *European Psychologist*, 24(1), 7–25.
- Aryanta, I. W. R. (2023). Manfaat Ikan Salmon Untuk Kesehatan. *Skripsi*, 5(1), 19–24.
- Dewi, E. U. (2020). Faktor-Faktor yang Mempengaruhi Perilaku Masyarakat Dalam Pencegahan Penularan Covid-19. *Jurnal Keperawatan*, 9(2), 21–25. <https://doi.org/10.47560/kep.v9i2.259>
- Hawari Maharudin, H. (2021). Pengaruh Edukasi Media Poster Terhadap Pengetahuan Masyarakat Usia 19-30 Tahun Tentang COVID-19. *Kesehatan Siliwangi*, 2(1), 251.
- Inara, C. (2020). Manfaat Asupan Gizi Ikan Laut untuk Mencegah Penyakit dan Menjaga Kesehatan Tubuh bagi Masyarakat Pesisir. *Kalwedo SaJurnalins (KASA)*, 1(2), 92–95.
- Indahsari, N. K., Masfufatun, M., & Herliani, O. (2022). Edukasi dan Pelayanan Kesehatan tentang Pemeriksaan Kadar Kolesterol dan Glukosa Darah Terkait Pencegahan Penyakit Jantung Koroner dan Diabetes Melitus di SMA Ta'miriyah Surabaya. *Jurnal Abdidas*, 3(6), 1009–1014. <https://doi.org/10.31004/abdidas.v3i6.709>
- Indriyani, D., & Wahyuni, S. (2020). Peran Petugas Kesehatan dalam Optimalisasi Nutrisi Ibu Hamil dan Monitoring Kesejahteraan Janin Melalui Model Edukasi Maternal-Neonatal (EMN) Berbasis Family Cultural. *The Indonesian Journal of Health Science*, 12(1), 17–25.
- Kemkes RI. (2018). *Laporan Nasional Riskesdas 2018*. Jakarta : Kementerian Kesehatan RI.
- Kristinawati, B., Wiand, N., Wijayanti, D., & Mardana, N. W. (2023). Pelatihan kader

- kesehatan sebagai upaya peningkatan pengetahuan dalam manajemen perawatan mandiri gagal jantung. *Jurnal Masyarakat Mandiri*, 7(5), 4570–4578.
- Leutualy, V., Siauta, M., Madiuw, D., Tasijawa, F. A., Lilipory, M., Tubalawony, S. L., & Embuai, S. (2022). Faktor Risiko yang Berhubungan dengan Kejadian Serangan Berulang Pasien Penyakit Jantung Koroner; Literature Review. *JUSTE (Journal of Science and Technology)*, 3(1), 68–79. <https://doi.org/10.51135/justevol3issue1page68-79>
- Lissa, N., & Azam, M. (2019). Kejadian Penyakit Jantung Koroner pada Penderita Diabetes Mellitus Info Artikel. *Higeia Journal of Public Health Research and Development*, 3(2), 311–323.
- Murfat, Z. (2022). Fakumi medical journal. *Jurnal Mahasiswa Kedokteran*, 2(5), 359–367.
- Naomi, S. W., Picauly, I., & Toy, S. M. (2021). Faktor Risiko Kejadian Penyakit Jantung Koroner (Studi Kasus di RSUD Prof. Dr. W. Z. Johannes Kupang). *Media Kesehatan Masyarakat*, 3(1), 99–107.
- Nuraeni, I., & Ariani Fatmawati, B. I. (2023). Efektivitas Pendidikan Kesehatan dengan Media Video terhadap Peningkatan Pengetahuan Ibu Hamil tentang Triple Eliminasi. *Jurnal Keperawatan*, 16(1), 545–552. <https://doi.org/10.32583/keperawatan.v16i2.1721>
- Prameswari, G. N. (2018). Promosi Gizi Terhadap Sikap Gemar Makan Ikan Pada Anak Usia Sekolah. *Journal of Health Education*, 3(1), 1–6.
- Purnama, A. (2020). Edukasi Dapat Meningkatkan Kualitas Hidup Pasien yang Terdiagnosa Penyakit Jantung Koroner. *Jurnal Kesehatan Indonesia*, 10(2), 66–71.
- Quraisy, A. (2022). Normalitas Data Menggunakan Uji Kolmogorov-Smirnov dan Saphiro-Wilk. *J-HEST Journal of Health Education Economics Science and Technology*, 3(1), 7–11. <https://doi.org/10.36339/jhest.v3i1.42>
- Rini Kundaryanti, A. S. (2022). Faktor-Faktor Yang Berhubungan Dengan Pemeriksaan Kehamilan Pada Ibu Hamil. *Jurnal 'Aisyiyah Medika*, 11(2), 155–164. <https://doi.org/10.36729/jam.v2i1.77>
- Santosa, W. N., & Baharuddin, B. (2020). Penyakit Jantung Koroner dan Antioksidan. *KELUWIH: Jurnal Kesehatan Dan Kedokteran*, 1(2), 98–103. <https://doi.org/10.24123/kesdok.v1i2.2566>
- Soparue, C. (2021). Peningkatan Pengetahuan Tentang Manfaat Konsumsi Ikan Melalui Kegiatan Sosialisasi “Gemar Makan Ikan-Gemarikan” Pada Anak Sekolah Dasar Negeri 5, Kecamatan Amahai, Kabupaten Maluku Tengah. *Jurnal Pengabdian Pada Masyarakat Kepulauan Lahan Kering*, 2(2), 46–53. <https://doi.org/10.51556/jpkmkelaker.v2i2.161>
- Sudayasa, I. P., Haryati, H., Purnamasari, Y., Chintia, Y. F., Anwar, N. R., Permatasari, P., & Pebriyanti, P. (2021). Peningkatan Pengetahuan Masyarakat dalam Penerapan Protokol Kesehatan melalui Edukasi Berbasis Media Online. *PengabdianMu: Jurnal Ilmiah Pengabdian Kepada Masyarakat*, 6(2), 175–183.
- Sukesi, T. W., Maurizka, I. R., Pratiwi, R. D., Kahar, M. V., Sari, D. A. P., Indriani, N. S., & Santi, S. (2020). Peningkatan Pengetahuan Rumah Sehat Dengan Metode Ceramah Dan Leaflet Di Dusun Modalan. *Jurnal Pemberdayaan: Publikasi Hasil Pengabdian Kepada Masyarakat*, 4(2), 183–190. <https://doi.org/10.12928/jp.v4i2.1961>
- WHO. (2012). *Health education: theoretical concepts, effective strategies and core competencies*. World Health Organization. Regional Office for the Eastern Mediterranean.
- WHO. (2020). *The top 10 causes of death*. <https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death>
- WHO. (2022). *Cardiovascular Diseases*. Geneva : World Health Organization.