

NUTRITION AND HYDRATION EDUCATION ON HEALTHY FASTING FOR PEDICAB DRIVERS COMMUNITY IN YOGYAKARTA

Fika Nur Indriasari^{1*}, Apri Nur Wulandari¹, Prima Daniyati Kusuma¹

¹STIKES Notokusumo, Yogyakarta, Indonesia

*fika.nurindriasari@stikes-notokusumo.ac.id

Abstrak: Pengemudi becak termasuk kelompok kurang mampu dan minim dari segi pendampingan ibadah. Pengemudi becak memiliki tantangan lapar dan dahaga ketika bekerja dimana kondisi ini memberikan resiko besar tidak terpenuhinya kebutuhan nutrisi dan hidrasi secara optimal selama berpuasa. Oleh karena itu, perlu adanya pendampingan dan edukasi tentang gizi seimbang selama puasa sehingga mereka tetap dapat menjalankan ibadah puasa dengan baik. Tujuan kegiatan pengabdian ini adalah memberikan edukasi kepada pengemudi becak tentang gizi dan hidrasi selama menjalankan ibadah puasa. Metode yang digunakan dalam pengabdian ini adalah edukasi melalui ceramah interaktif dengan menggunakan media audiovisual berupa slide powerpoint dan video. Peserta kegiatan adalah pengemudi becak di wilayah kelurahan Giwangan, Yogyakarta. Metode yang digunakan adalah ceramah interaktif yang bertujuan mendorong motivasi belajar sehingga terwujud pembelajaran yang aktif. Evaluasi yang digunakan dengan menggunakan kuesioner pretest dan posttest yang diberikan sebelum dan sesudah edukasi. Hasil uji Wilcoxon menunjukkan nilai signifikansi 0.000 (<0.05) artinya ada perbedaan yang signifikan tingkat pengetahuan sebelum dan sesudah diberikan edukasi. Hasil pengabdian ini menunjukkan bahwa terjadi peningkatan pengetahuan peserta kegiatan sebesar 34.1% dengan kategori baik. Peserta menunjukkan antusiasme yang baik selama proses edukasi yang ditunjukkan dengan aktivitas bertanya dan berdiskusi. Kegiatan ini dapat memberikan pengetahuan tentang asupan gizi dan hidrasi sehingga para pengemudi becak tetap bugar dalam menjalankan aktivitas bekerja saat berpuasa.

Kata Kunci: edukasi, gizi, hidrasi, puasa, pengemudi becak

Abstract: Pedicab drivers are underprivileged and lack religious assistance. Pedicab drivers face the challenge of hunger and thirst while working, which poses a great risk of not fulfilling optimal nutritional and hydration needs during fasting. Therefore, it is necessary to provide assistance and education about balanced nutrition during fasting so they can still properly carry out fasting. The purpose of this service activity is to provide education to pedicab drivers about nutrition and hydration during fasting. The method used in this service is education through interactive lectures using audiovisual media such as PowerPoint slides and videos. The participants were pedicab drivers in Giwangan urban village, Yogyakarta. The method used was interactive lectures to encourage motivation to realize active learning. The evaluation used pretest and posttest questionnaires given before and after the education. The Wilcoxon test results show a significance value of 0.000 (<0.05), meaning there is a significant difference in the level of knowledge before and after education. The results of this service program showed an increase in participants' knowledge by 34.1% in the good category. Participants showed good enthusiasm during the education process, which was shown by asking questions and discussing activities. This program can provide knowledge about nutrition and hydration so that pedicab drivers remain fit to carry out work activities while fasting.

Keywords: education, nutrition, hydration, fasting, pedicab drivers

Introduction

Fasting is restraining one's appetite for food, drink, and everything that can cancel it out within a certain period (Paoli et al., 2019). Generally, people fast as part of their religious observance or for specific health reasons. Fasting has many benefits, both in terms of physical

and psychological health. The health benefits of fasting include burning fat in the body, increasing human growth hormone, improving brain function, reducing blood pressure, regulating triglycerides, overcoming insulin resistance, and reducing the risk of aging and dangerous diseases (Kemenkes, 2022). Good dietary management needs to be done during fasting to achieve these benefits because a person's diet will change during fasting. Food intake can be reduced by 20-30%, from the daily requirement of about 2000 kcal decreased to about 1600 kcal. On the other hand, nutritional needs must still be maintained by providing balanced and quality food intake (Wang, 2022).

Several literature reviews explained that fasting has an effect on weight loss and showed an improved lipid profile characterized by decreased triglycerides and total cholesterol and increased high-density lipoprotein (HDL). However, improper implementation of fasting, such as lack of fluid intake, can cause fluid deficiency or dehydration (Rouhani & Azadbakht, 2014). When the body lacks fluids, it will experience mild dehydration, resulting in decreased concentration, mood, cognitive ability, headaches, fatigue, and impaired muscle function (Khan et al., 2019). Minimizing this condition is important as it can impact the solemnity of fasting. Therefore, the habit of consuming enough drinking water must be maintained during the month of Ramadan so that activities during fasting can run well.

The Nutrition Adequacy Level in 2019 recommends a fluid intake of 2350 ml per day for females and 2500 ml per day for males (Permenkes, 2019). While fasting, individuals must fulfill the intake amount to ensure optimal body functioning and the ability to carry out normal activities. More than half of the respondents in Indonesia did not fulfill their fluid needs, as shown by a study conducted by the Indonesian Hydration Working Group on adults. The average daily drinking intake during fasting in the month of Ramadan is about 1700 ml per day, which means only about 70% of the daily requirement. In addition to water as the main consumption of adults in Indonesia, it turns out that sugary drinks with added sugar are one of the main consumption options during fasting. The average daily mineral water consumption is 1262 ml/day and the average consumption of sugary drinks with added sugar is 200 ml/day. A person's diet during fasting will also change, from 3 meals to 2 meals a day. This change in meal frequency will reduce the amount of nutrients that enter the body. Therefore, the diet during fasting needs to be tailored to the changes in eating frequency. The amount of food consumed during fasting needs to be adjusted to the body's condition, and the composition of the food consumed must be balanced (Hidayati, 2020).

Health experts claim that fasting can boost the immune system, reduce free radicals and increase antioxidants. When fasting, the body's condition, especially the intestines and stomach, is in a resting phase, this condition also helps the detoxification process or removing toxins from the body (Nur, 2020). As many as 70% of the immune system is located in the intestines, thus health starts with the intestines. A healthy intestine is built through a healthy and balanced diet, being physically active, maintaining good relationships, improving sleep quality, good stress management, and avoiding the consumption of risky foods and drinks (Brandhorst et al., 2016). During fasting, intestinal contractility decreases to once per 2 hours, therefore fasting is beneficial in spastic colitis and other intestinal motility disorders (Azizi, 2010). The Migrating

Motor Complex (MMC) is a fundamentally different motor activity of the stomach and small intestine in the fasting state. The Migrating Motor Complex (MMC) starts from the stomach and travels distally through the small intestine. In the fasting state, the MMC has a dominant pattern and is called the Interdigestive Myoelectric Complex (IDMEC), which has a cleansing function, protecting the stomach and small intestine from bacterial overgrowth through mechanical propulsion of food residues and bacteria distally and through lubrication of the stomach and small intestine through increased gastric acid secretion, bile and pancreatic fluid flow (Firmansyah, 2015). The results of a preliminary study conducted on five pedicab drivers stated that they all rarely carry out sunnah fasting and even three people have never fasted Ramadan. Their reason is because they need more energy to work, cannot endure thirst and hunger, and cannot stop smoking. Pedicab drivers also stated that they do not understand what nutrition is appropriate to consume during sahur and iftar so that they can endure fasting for one month.

Ramadan fasting is one of the obligations that must be fulfilled by Muslims. If a person does not fulfil the obligation of fasting without certain sharia reasons, then there is a fine that must be paid according to sharia provisions. This fasting obligation also applies to heavy workers such as farmers, construction labourers, rickshaw drivers etc. These heavy labourers may not fast due to some emergency conditions, but they are still obliged to substitute fasting at another time. However, some scholars classify heavy labourers as those who are unable to fast, as stated in Surah al-Baqarah verse 184. According to Surah al-Baqarah verse 184, those who are unable to fast can pay fidyah and not substitute the fast. However, if they have the opportunity, it will be better to substitute the fast on another day. Therefore, it is necessary to educate becak drivers about proper nutrition and hydration while fasting. This education aims to provide knowledge to pedicab drivers that fasting is not just an act of religious worship but can provide benefits to support their health status.

Method

This community service program commenced with a survey and interviews with several pedicab drivers regarding the obstacles experienced during fasting. The following stages were problem identification, problem formulation, problem solving and activity evaluation. The participants in this programme were 44 pedicab drivers in Giwangan urban village, Yogyakarta. The pedicab becak drivers were chosen as participants in this community service programme was because this group is a lower middle-class community and they are very rare to get education and assistance related to nutrition and healthy diet during fasting in the month of Ramadan. In addition, pedicab drivers are categorised as underprivileged groups and have minimal knowledge in Islamic sharia knowledge related to fasting. During the fasting month, pedicab drivers have a big challenge, namely hunger and thirst while working. This condition poses a risk of not being able to fulfil nutritional and hydration needs optimally, thus potentially disrupting the solemnity of fasting.

The method used in this community service program was an interactive-lectures using audiovisual media (Powerpoint slides and videos). The lecture and Q&A method can significantly

increase the knowledge of the participants. The interaction during the counselling was able to attract participants to be active in the counselling activities. Based on Skinner's theory, a given stimulus can affect a person's response, the way a person gains knowledge and a person's level of knowledge can affect the person's attitudes and actions (Notoatmojo, 2014). The results of previous research also state that counselling methods, lectures have advantages compared to other methods because participants can pay attention and imitate the facilitator directly. Thus, it will give the learners better confidence (Goni et al., 2019). Health education aims to change unhealthy behaviour into healthier behaviour through the dissemination of health messages to embed and convince participants so that they can understand healthy lifestyles. Finally, a good understanding of health will affect the attitudes and behaviour of participants in their daily life patterns (Maulana, 2009).

This community service program comprised of five sessions. The first session was for participants to do pre-test questions, followed by the second session, which was the opening and brainstorming of participants' knowledge of nutrition and hydration during fasting. The third session was the presentation of material using audio-visual media, namely powerpoint slides and videos. The material provided through powerpoint slides was about the importance of paying attention to nutrition and hydration during fasting. The material presented included foods and drinks that are recommended and not recommended when breaking the fast and sahur, the amount of fluid that must be consumed every day and recommended exercise during fasting. Furthermore, participants watched a video showing balanced nutrition and hydration that needs to be considered when fasting. The fourth session was closing and Q&A and the last session was evaluation by giving post test questions.

The design used was pre-post test design by comparing knowledge before and after the programme. Data collection used a total sampling technique where the level of knowledge of participants was measured using a questionnaire given before and after education. The questionnaire contained 10 questions with the highest score weight of 10. The question items included the participants' knowledge of foods recommended and not recommended during fasting, the amount of fluid needs and exercise performed during fasting. Answers were presented in the form of true and false with each answer getting a score of 0-1.

The data analysis used was the Wilcoxon test. The purpose of this test is to see if there is an average difference between two samples that are paired or related (Nursalam, 2016). This analysis is used to determine the difference in knowledge of participants before and after the program. The process of this service activity is described in [Figure 1](#) below

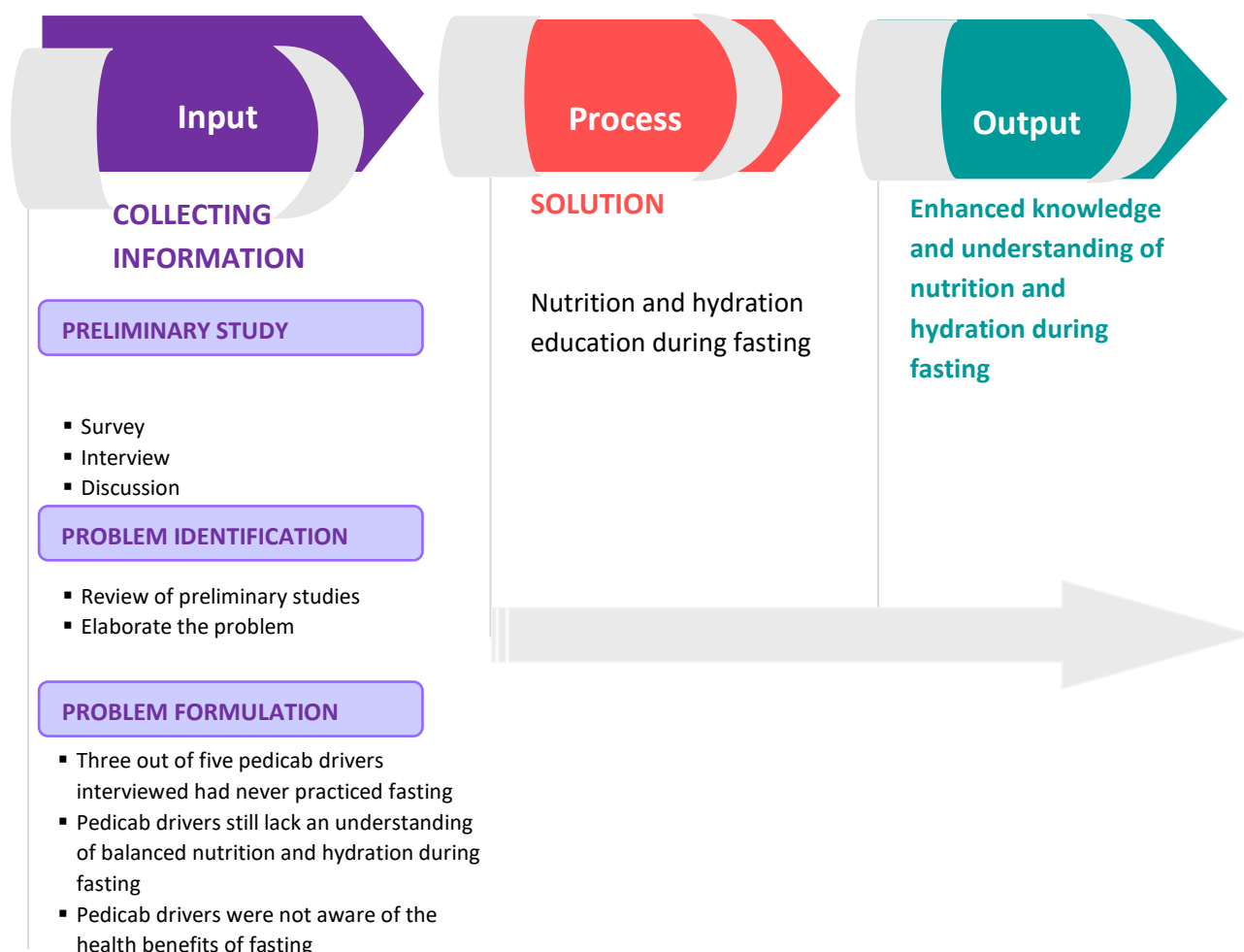


Figure 1. The flow of community service programme

Results and Discussion

One of the indicators of the success of this community service programme is the enthusiasm of the participants where they ask questions and discuss topics about fasting. Some of these topics include whether or not it is obligatory to eat and drink sweets when breaking the fast, whether it is permissible not to do sahur, sahur by consuming instant noodles, and eating fried foods when breaking the fast. In addition, there was an increase in knowledge about nutrition and hydration during fasting in the good category by 34.1%. The interactive lecture method used in this programme can encourage active learning and is needed to motivate learning. The success of the teaching and learning process is also supported by the teaching media used. The use of teaching media is based on the right selection so as to enlarge the meaning and function in supporting the effectiveness and efficiency of the teaching and learning process (Ali, 2010). The same method was also used in other community service programmes related to the provision of Tuberculosis prevention education. As a result, participants' knowledge can increase and they were enthusiastic in following all stages of the activity (Waskito et al., 2023). The implementation of the program is illustrated as shown in Figure 2



Figure 2. Nutritional and hydration education during fasting

Table 1. Frequency distribution of characteristics of participants in the nutrition and hydration education programme during fasting

Respondents	Frequency	%
Ages		
40-50 years	4	9.1
51-60 years	18	40.9
61-70 years	12	27.3
>71 years	10	22.7
Level of education		
Not enrolled in formal education	2	4.5
Primary school	23	52.3
Junior high school	10	22.7
Senior high school	9	20.5
Comorbidities		
Hypertension	12	27.3
Hypotension	4	9.1
Cholesterol	5	11.4
Vertigo	4	9.1
COPD	9	20.5
Uric Acid	8	18.2
Diabetes Mellitus	2	4.5

Source: Primary Data (2023)

Based on [Table 1](#), most participants in the age range of 51-60 years were 18 participants (40.9%). This programme participant is an elderly group, namely someone who has entered the final stage of the life phase. The group categorised as elderly will experience a process called the Aging Process or the aging process (WHO, [2022](#)). Factors that influence the aging process include: heredity, nutrition, health status, life experience, environment and stress.

The aging theory states that free radicals can help accelerate the aging process. In old age, several degenerative diseases often occur, one of which is hypertension. Hypertension in the elderly is divided into hypertension where systolic pressure is equal to or greater than 140 mmHg and or diastolic pressure is equal to or greater than 90 mmHg, and isolated systolic hypertension where systolic pressure is greater than 160 mmHg and diastolic pressure is lower

than 90 mmHg (Franklin, 2012). In this community service programme, most of the participants had hypertension as many as 12 people (27.3%). Hypertension is one type of non-communicable disease that is chronic and silent killer, with a very high prevalence rate in the elderly. One of the causes of hypertension in the elderly is dietary factors. Most of the elderly consume meat, chicken, milk that contains fat and fried foods that contain oil. The higher the fat, the higher the cholesterol levels in the blood that will precipitate and become plaque attached to the walls of the arteries, the plaque causes narrowing of the arteries, forcing the heart to work harder and the blood pressure becomes higher. High fat can cause obesity which can trigger the onset of hypertension (Riamah, 2019). This condition is further supported by rarely doing sports activities. Some pedicab drivers stated that they were no longer actively working due to the outbreak of the Covid-19 pandemic and the rise of online motorbike taxi applications which resulted in a decrease in their income.

The second comorbidity was COPD (Chronic Obstructive Pulmonary Disease) as many as 9 people (20.5%). Professions such as pedicab drivers have a high level of exposure to motor vehicle gas emissions because they always work on the road. This continuous exposure can potentially interfere with the health of the respiratory system. In Table 1, the characteristics of pedicab drivers are mostly low education, advanced age, and very low income. Air pollution also produces various respiratory diseases such as COPD, which is a chronic lung disease characterised by airflow obstruction in the airways that is not fully reversible. This airflow obstruction is progressive and associated with a pulmonary inflammatory response to toxic and harmful particles or gases (Jiang et al., 2016). Air pollution can cause inflammation in the respiratory epithelium so that cells will release cytokines that can cause muscle weakness, weight loss, and inhibition of normal endogenous antiprotease. Inflammation in COPD is an amplified inflammatory response to chronic irritants from inhaled air and cigarette smoke (Bagdonas et al., 2015). A risk factor for COPD is smoking. In fact, the social habit of pedicab drivers is smoking. This is in accordance with the statements of several pedicab drivers during the examination, that their complaint is a cough that does not heal and has a habit of smoking from a young age. Cigarette smoke has a high prevalence as a cause of respiratory symptoms and impaired lung function (Bai et al., 2017). Smoking can also affect appetite and nutritional status, putting smokers at risk of malnutrition.

Table 2. The difference between before and after education on nutrition and hydration during fasting based on Wilcoxon-Test result

Knowledge	The difference		P-Value
	Frequency		
	Pre-test	Post-test	
Good	7 (15.9%)	22 (50%)	0.000
Moderate	31 (70.5%)	19 (43.2%)	
Poor	6 (13.6%)	3 (6.8%)	

Source: Wilcoxon-Test (2023)



Figure 3. Pedicab Driver Health Check

Educational topics in this programme included recommended and discouraged foods and drinks during iftar and suhoor, the minimum amount of fluid that should be consumed daily, and recommended exercise during fasting. Before and after the education, participants completed a 10-question questionnaire. The questionnaire was used to determine the participants' knowledge of nutrition and hydration needed during fasting. Before the education programme, the knowledge level of 31 participants (70.5%) was in the moderate category. After the education was given, the level of knowledge of the participants was in the good category as many as 22 people (50%). The results of the normality test using Shapiro Wilk showed a significance value <0.05 so that the data was not normally distributed, then the difference test used was to use the Wilcoxon-test (Table 2) showing that the significance value (p-value) of knowledge was 0.000 (<0.05), meaning that there was a significant difference in the level of knowledge of respondents before and after being given education about nutrition and hydration during fasting. A person's level of education affects the level of knowledge (Notoatmojo, 2014). This is supported by the fact that most of the respondents were educated even at the elementary level as much as 52.3%. During fasting, eating time is limited. In this limited time, it must be able to optimise the nutrients that enter the body, namely by regulating the right nutritional intake at breakfasting and sahur. When fasting the body's daily calorie needs remain the same as the calorie needs when not fasting, which is around 1500-2500 kcal every day (British Nutrition Foundation, 2023)

Health education materials include: 1) Maintaining sahur to keep the body energised; 2) Prohibition of eating instant noodles during sahur regularly; 3) Restriction of isotonic drinks during fasting. When a person is going to sahur, generally a person is in a state of just waking up so that they do not lose a lot of body fluids, therefore they do not need isotonic drinks. Isotonic fluids contain sodium (salt) which will increase blood pressure if consumed too much. The content of other electrolytes will also adversely affect kidney performance for people who already have kidney problems (Regenmortel et al., 2017). In addition, isotonic liquids contain

sugar, so they are not recommended for people who are obese or have diabetes mellitus (diabetes). Isotonic drinks also generally taste sour, so they will interfere with stomach function in people who suffer from ulcers and other gastric diseases (Arisanti, 2011); 4) Restriction of foods and beverages high in sugar, salt and fat in order to avoid health problems such as constipation, hypertension, hyperglycaemia and can cause fatigue & weakness, easy thirst and reduce the possibility of nausea and gastric discomfort. Sugar consumption is limited to a maximum of 4 tablespoons per day, as excessive sugar consumption can lower the body's immunity, as well as risk degenerative diseases. Also limit salt consumption to a maximum of 1 teaspoon per day as it will increase the risk of hypertension and fat consumption to a maximum of 5 tablespoons per day as it triggers excess weight and increases the risk of heart disease and diabetes; 5) Avoid consumption of caffeine-containing beverages such as tea and coffee as they are diuretics (increase the frequency of urination and make the body thirsty faster). This can worsen the condition of dehydration (Helmyati, 2022); 6) When breaking the fast, start eating dates, fruits or foods that contain simple carbohydrates that are easily absorbed by the body to normalise blood sugar levels. Excessive consumption of carbohydrates will cause blood glucose levels to rise rapidly and fall rapidly due to the effects of the hormone insulin. This can stimulate the hormone ghrelin which triggers fatigue and weakness so that it can cause hunger again; 7) Meeting the body's fluid needs by consuming 2 litres of water or 8 glasses per day (Shadman et al., 2016).

During fasting, the body may become mildly dehydrated, characterised by headaches, fatigue and difficulty concentrating. To prevent excessive thirst, fluid consumption can be divided in the following pattern: 1 glass at iftar, 1 glass after dinner, 1 glass after isha' time, 1 glass after tarawih time, 1 glass before bedtime, 1 glass after waking up, 1 glass at sahur, and 1 glass before dawn. The volume of water drunk at one time should not be excessive (enough about 250-300 mL) because the body will not be able to absorb large amounts of water at once (Rohimah, 2021).

Conclusion

This community service programme can increase the knowledge of participants on the importance of nutrition and hydration while fasting. A follow-up plan needs to be carried out balanced nutrition education for the elderly and elderly gymnastics to optimise the health and fitness of the elderly.

Acknowledgment

We would like to thank Yayasan BIAS (Bina Anak Sholeh) and STIKES Notokusumo Yogyakarta for facilitating and supporting the implementation of this community service programme.

References

Ali, M. (2010). *Guru Dalam Proses Belajar Mengajar*. Sinar Baru Algensindo.

- Arisanti, T. (2011). *Kurangi Minuman Isotonik Saat Puasa*. Ibu & Balita PRIMAGRO. <https://www.ibudanbalita.com/forum/diskusi/Kurangi-Minuman-Isotonik-Saat-Puasa>
- Azizi, F. (2010). Islamic Fasting and Health. *Annals of Nutrition & Metabolism*, 56(4), 273–282. <https://doi.org/10.1159/000295848>
- Bagdonas, E., Raudoniutw, J., Bruzauskaite, I., & Aldonyte, R. (2015). Novel aspects of pathogenesis and regeneration mechanisms in COPD. *International Journal of COPD*, 1(10), 995–1013. <https://doi.org/https://doi.org/10.2147/COPD.S82518>
- Bai, J., Chen, X., Liu, S., Yu, L., & Xu, J.-F. (2017). Smoking cessation affects the natural history of COPD. *International Journal of COPD*, 2017(12), 3323–3328. <https://doi.org/10.2147/COPD.S150243>
- Brandhorst, S., Choi, I., Wei, M., Cheng, C., Sedrakyan, S., Navarrete, G., Dubeau, L., Yap, L., Park, R., Vinciguerra, M., Di Biase, S., Mirzaie, H., Mirisola, M., Childress, P., Ji, L., Groshen, S., Penna, F., Odetti, P., Perin, L., ... Longo, V. (2016). A Periodic Diet that Mimics Fasting Promotes Multi-System Regeneration, Enhanced Cognitive Performance, and Healthspan. *Cell Metab*, 22(1), 86–99. <https://doi.org/10.1016/j.cmet.2015.05.012.A>
- British Nutrition Foundation. (2023). *A healthy Ramadan*. British Nutrition Foundation. <https://www.nutrition.org.uk/putting-it-into-practice/food-seasons-and-celebrations/a-healthy-ramadan/#:~:text=Drinking plenty of fluids%2C as,a lot of salty foods.>
- Firmansyah, M. A. (2015). Pengaruh Puasa Ramadhan pada Beberapa Kondisi Kesehatan. *Continuing Medikal Education*, 42(7), 510–515.
- Franklin, S. S. (2012). What Can We Learn From the American Heart Association and American College of Cardiology Expert Consensus Document on Geriatric Hypertension? *Clinical Cardiologyal Cardiology*, 2, 1–2. <https://doi.org/https://doi.org/10.1002/clc.21004>
- Goni, G., Rattu, J. A. M., & Malonda, N. S. H. (2019). Pengaruh Penyuluhan Dengan Teknik Ceramah Terhadap Pengetahuan Pelajar Tentang Gizi Seimbang di Sekolah Dasar Kecamatan Tompaso (Studi Kasus SD GMIM 2 dan SD Negeri 2 Tompaso). *Jurnal KESMAS*, 8(7), 328–335.
- Helmyati. (2022). *Menjaga Hidrasi Selama Bulan Ramadan*. Pusat Kesehatan Dan Gizi Manusia Universitas Gadjah Mada. <https://pkgm.fk.ugm.ac.id/2022/04/12/menjaga-hidrasi-selama-bulan-ramadan/>
- Hidayati, M. (2020). Menjaga Kesehatan Selama Berpuasa dengan Asupan Gizi Seimbang. *Dinas Kesehatan Provinsi NTB*.
- Jiang, X. Q., Mei, X. D., & Feng, D. (2016). Air pollution and chronic airway diseases: What should people know and do? *Journal of Thoracic Disease*, 8(1), E31–E40. <https://doi.org/10.3978/j.issn.2072-1439.2015.11.50>
- Kemenkes. (2022). *Apa Saja Manfaat Berpuasa*. Kementerian Kesehatan RI Direktorat Jenderal Pelayanan Kesehatan. https://yankes.kemkes.go.id/view_artikel/158/apa-saja-manfaat-berpuasa
- Permenkes RI Nomor 28 Tahun 2019 Tentang Angka Kecukupan Gizi yang Dianjurkan Untuk Masyarakat Indonesia, Pub. L. No. 28 (2019).
- Khan, N. A., Westfall, D. R., Jones, A. R., Sinn, M. A., Bottin, J. H., Perrier, E. T., & Hillman, C. H. (2019). A 4-d Water Intake Intervention Increases Hydration and Cognitive Flexibility among Preadolescent Children. *Journal of Nutrition*, 149(12), 2255–2264. <https://doi.org/10.1093/jn/nxz206>
- Maulana, H. D. (2009). *Promosi Kesehatan*. EGC.
- Notoatmojo, S. (2014). *Promosi Kesehatan dan Perilaku Kesehatan*. Rineka Cipta.
- Nur, S. (2020). *Puasa dan Kesehatan*. Kementerian Agama Republik Indonesia.
- Nursalam. (2016). *Metodologi Penelitian Ilmu Keperawatan: Pendekatan Praktis*. (4th ed.). Salemba Medika.
- Paoli, A., Tinsley, G., & Bianco, A. (2019). The Influence of Meal Frequency and Timing on Health in Humans: The Role of Fasting. *Nutrients*, 11(719), 1–19. <https://doi.org/10.3390/nu11040719>
- Regenmortel, N. Van, Weerdt, T. De, Craenenbroeck, A. H. Van, Roelant, E., Verbrugghe, W., Dams, K., Malbrain, M. L. N. G., Wyngaert, T. Van Den, & Jorens, P. G. (2017). *Effect of isotonic versus hypotonic maintenance fluid therapy on urine output, fluid balance, and electrolyte homeostasis: a crossover study in fasting adult volunteers*. 118(May), 892–900. <https://doi.org/10.1093/bja/aex118>

- Riamah. (2019). Faktor-Faktor Penyebab Terjadinya Hipertensi Pada Lansia Di UPT PSTW Khususul Khotimah. *MENARA Ilmu*, XIII(5), 106–113.
- Rohimah, B. (2021). *Sehat saat Puasa Ramadhan dengan Gizi Seimbang*. Dinas Kesehatan Provinsi Kalimantan Tengah. <https://dinkes.kalteng.go.id/infografis/sehat-saat-puasa-ramadhan-dengan-gizi-seimbang/>
- Rouhani, M. H., & Azadbakht, L. (2014). Is Ramadan fasting related to health outcomes? A review on the related evidence. *Journal of Research in Medical Sciences*, 19(10), 987–992.
- Shadman, Z., Akhoundan, M., Poorsoltan, N., Nikoo, M. K., Zhand, C. A., Soleymanzadeh, M., Alsadat, Z., & Rohani, S. (2016). Nutritional Education Needs in Relation to Ramadan Fasting and Its Complications in Tehran , Iran. *Iranian Red Crescent Medical Journal*, 18(8), 26130. <https://doi.org/10.5812/ircmj.26130.Research>
- Wang, Y. (2022). Review Article The Effect of Fasting on Human Metabolism and Psychological Health. *Disease Markers*, 5(1). <https://doi.org/https://dinkes.kalteng.go.id/infografis/sehat-saat-puasa-ramadhan-dengan-gizi-seimbang/>
- Waskito, A., Arifa, S., Alifia, A., Assyfa, N., Saleha, A. K., Nurnajwa, & Sakdiah, H. (2023). Edukasi Tentang Pencegahan Tuberkulosis Melalui Pemenuhan Sanitasi Di Desa Benua Raya Kecamatan Bati-Bati Kabupaten Tanah Laut. *Transformasi: Jurnal Pengabdian Masyarakat*, 19(1), 131–140.
- WHO. (2022). *Ageing*. World Health Organization. https://www.who.int/health-topics/ageing#tab=tab_1