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Socialization on the Utilization of Pineapple as a Natural Source of Antioxidants to Support Health Productive Age Communities in West Bangkok Gurah Kediri

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ABSTRACT
Exposure to external free radicals—such as pollution, ultraviolet radiation, and smoking-can trigger oxidative stress, which plays a role in the development of various degenerative diseases, including heart disease and cancer. Essential preventive efforts can be made by increasing the consumption of natural foods rich in antioxidants. Pineapple (*Ananas comosus*), as a local commodity, is known to contain high antioxidant levels that can help neutralize free radicals. This community service activity aimed to improve the knowledge and understanding of residents in Dusun Bangkok Barat, Gurah, Kediri regarding the dangers of free radicals, their health impacts, and the benefits of pineapple as a natural source of antioxidants. The program used a one-group pretest–posttest design involving 32 respondents. Respondents consisted of residents of Bangkok aged 18–55 years who had previously consumed pineapple and were willing to participate by completing the questionnaire. The intervention consisted of a health education session conducted on July 18, 2025. The session was delivered through a lecture and a question-and-answer discussion using PowerPoint presentation slides. Educational pamphlets were distributed to participants, and questionnaires were administered to assess participants knowledge before and after the session. Data analysis showed a significant increase in knowledge across all measured aspect such as knowledge regarding free radicals, antioxidants, pineapple, as well as community perceptions and habits. The average improvement in correct responses between the pre-test and post-test exceeded 40%, with the highest increase (57%) seen in understanding the sources of free radicals. Additionally, respondents' belief in the benefits of pineapple rose to 97%, and 88% expressed an intention to increase their consumption of antioxidant-rich fruits after attending the session. The program proved effective in improving knowledge, shifting perceptions, and encouraging positive behavioral intentions. These findings highlight the potential of community health education based on local commodities, such as pineapple, as an effective and sustainable preventive strategy.

Keywords **:** Pineapple, Antioxidants, Free radical, health promotion

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INTRODUCTION

Free radicals are reactive molecules that can form naturally in the body through metabolic processes such as cellular respiration, as well as from external factors such as air pollution, ultraviolet (UV) radiation, and various harmful chemicals. The accumulation of free radicals can disrupt the body's redox balance, which is normally regulated by endogenous antioxidant systems. When this balance is disturbed, oxidative stress occurs, damaging cells, proteins, lipids, and DNA, ultimately triggering various degenerative diseases (Chaudary *et al.,* 2023).

In daily life, community exposure to free radicals in increasingly unavoidable. Air pollution from vehicle emissions and industrial activities, prolonged exposure to sunlight, unhealthy dietary patterns, and smoking are common factors that elevate free radical production (Gustina *et al.,* 2021; Coughlin, 2018; Satriawan, 2022). Prolonged oxidative stress resulting from these exposures has been associated with cardiovascular diseases, cancer, premature aging, and impaired organ function, particularly among individuals with unhealthy lifestyles (Aaronson *et al.,* 2020; Wang *et al.,* 2021).

Despite these risks, public awareness regarding free radicals and the importance of antioxidants in preventing oxidative stress remains limited. Many people are exposed to free radical sources without adequate knowledge of preventive strategies, including the role of natural antioxidant rich foods. This condition highlights the need for community-based health education to improve understanding of oxidative stress and promote healthier lifestyle choices.Several previous studies have examined the health benefits of pineapple (*Ananas comosus*) from both research and community-based activities. Pineapple has been reported to contain high levels of antioxidant compounds, particularly vitamin C and phenolic substances, which contribute to reducing oxidative stress (Winahyu *et al*., 2022). Bioactive components in pineapple, including flavonoids and bromelain, have also been shown to exhibit antioxidant and anti-inflammatory properties that support tissue repair and metabolic health (Pereira *et al.,* 2021). In addition, regular consumption of antioxidant rich fruits such as pineapple may help reduce the risk of chronic degenerative diseases associated with free radical damage (Gul *et al.,* 2021).

Community service and applied studies further support the potential of pineapple as functional food. Pineapple consumption has been associated with the prevention of cardiovaskular disease, diabetes, and cancer through its antioxidant activity (Kobayashi *et al.,* 2014). Several community based programs have reported improved public awareness and acceptance of pineapple when promoted through practical forms such as fresh fruit, juice, or syrup (Sihotang et al., 2025; Epriyani *et al.,* 2025). Compared to these previous studies, which mainly focused on physiological effects or direct consumption, the present activity emphasizes health education to improve community knowledge and behavioral intention regarding pineapple consumption. This approach complements existing research by strengthening preventive efforts through increased awareness and informed dietary choices.

Pharmacists, as frontline health professionals, play an essential role in providing education to the community regarding the dangers of free radicals, the importance of antioxidants, and the use of natural ingredients to maintain health. Through community service activities, the faculty of health sciences at university of Kadiri aims to improve public knowledge about free radicals, antioxidants, and the use of pineapple as an easily accessible and safe natural antioxidant source. The purpose of this community outreach program is to enhance public understanding of free radicals, their health impacts, and the benefits of natural antioxidants-particularly from pineapples-in maintaining overall health and preventing degenerative diseases.

METHOD

This community service activity employed an educational approach through health outreach and counseling on free radicals, antioxidants, and the use of natural ingredients such as pineapple as a source of antioxidants. The activity was conducted using a pretest-posttest one group design, which measures participants knowledge before and after the educational intervention without a comparison group. This design was chosen to directly asses changes in community understanding after receiving the educational materials.

The target participants were residents of dusun Bangkok barat, Gurah, Kediri on july 18, 2025. The inclusion criteria consisted of individuals who attended the event, were aged 18 to 55 years old, had previously consumed pineapple, and were willing to participate in the educational session by completing the questionnaire. A total of 32 participants took part in this activity. Participant recruitment was conducted using a convenience sampling approach, in which community members who met the inclusion criteria and were present at the activity site were invited to participate. The program was carried out in three stages:

1. Pretest, to assess participant's baseline knowledge of free radicals, antioxidanrs, and the benefits of pineaplle as a natural ingredient.
2. Health educational was delivered using powerpoint presentations and leaflets. The intervention consisted of direct counseling, material presentation, and interactive discussions on sources of free radicals, their health impacts, and the role of natural antioxidants.
3. Posttest, to evaluate the improvement in knowledge following the education session.

The instument used was a knowledge questionnaire developed based on key material indicators, including: the definition of free radicals, sources of exposure, health impacts, antioxidant mechanism, and the benefits of pineapple. The questionnaire consisted of 16 multiple choice questions. Content validity was assessted through expert judgment, in shich subject matter experts evaluated the relevance, clarity, and appropriateness of each item to ensure alignment with the educational objectives. Item validity was further examined using item total correlation analysis, and all items demonstrated acceptable correlation values, indicating that the questionnaire items were valid.

Reability instrument was assessed using cronbach's alpha to evaluate intrernal consistency, indicating that the questionnaire was reliable for measuring participants knowledge. Pretest and posttest results were analyzed descriptively by comparing the average scores before and after the intervention to assess the increase in participant's knowledge.

RESULTS

Respondent demographics

The first section presents the demographic profile of the respondents as a basis for assessing the suitability and relevance of the health intervention conducted. The demographic data obtained from section A of the questionnaire provide an overview of the respondent's social and economic conditions. Demographic information including age, gender, highest educational attainment, and occupation is summarized in tale 1. This profile helps to contextualize respondent backgrounds and their relationship to literacy levels and potential health vulnerabilities within the studied population.

Table 1. Distribution of Respondents' Demographic Characteristics

Category	Response Options	Number (n)	Percentage (%)
Age	18-20 years	2	6.25
	20–35 years	18	56.25
	36–50 years	10	31.25
	51-55 years	2	6.25
Gender	Male	12	37.5
	Female	20	62.5
Education	Elementary/Junior High School	4	12.5
	Senior High School/Vocational School	12	37.5
	Higher Education	16	50
Occupation	Housewife	10	31.25
	Student	8	25
	Employee/Trader/Others	14	43.75

The respondents were predominantly within the productive age range (18-55 years old), which is considered a priority target for preventive health programs. The educational of the participants generally indicated adequate literacy, enabling effective comprehension of the educational materials provided. Female participation was more dominant than male participation, suggesting higher involvement in health related activities within West Bangkok. Furthermore, the occupational background of most respondents may be associated with daily exposure to environmental risk factor, including free radicals.

Effectiveness of the Socialization Program on Improving Knowledge

This section discusses the effectiveness of the socialization activity in enhancing community knowledge regarding antioxidants. The analysis was conducted by comparing pre-test and post-test scores to determine the extent of improvement in respondents' understanding after the intervention. The differences between pre- and post-intervention scores serve as an important indicator of the success of the health education program. A summary of these measurements is presented in Table 2 below.

Table 2. Comparison of Pre-test and Post-test Knowledge Levels (n = 32)

Question	Pre-test (%)	Post-test (%)	Increase
Definition of Free Radicals	50%	97%	47%
Sources of Free Radicals	34%	91%	57%
Effects of Free Radicals	44%	94%	50%
Definition of Antioxidants	56%	97%	44%
Sources of Antioxidants	78%	100%	22%
Benefits of Antioxidants	84%	100%	16%
Do Pineapples Contain antioxidant	63%	97%	34%
Benefits of Pineapples	50%	91%	41%

Overall, the data analysis indicates a significant improvement in all aspects of knowledge assessed. The most notable gains occurred in concepts related to free radicals, while post intervention understanding of antioxidants reached an optimal level. The

consistent improvement indicate that the educational interventions was effective in enhancing knowledge, from basic concepts to applied information regarding pineapple as a functional food rich in antioxidant.

Changes in Perception and Behavioral Intentions

This section discusses the changes in respondents' perceptions and behavioral intentions related to the consumption of pineapple and other antioxidant-rich fruits after the educational program. The analysis was conducted by comparing respondents' answers from the pre-test and post-test to identify the extent to which the session influenced their beliefs and interest in adopting the recommended health behaviors. The results of this assessment are summarized in Table 3 below.

Table 3. Changes in Perception and Intention to Consume Antioxidant-Rich Fruits

Question	Pre-test (%)	Post-test (%)
Agree that consuming pineapple helps maintain health?	78%	97%
Interested in consuming more antioxidant-rich fruits (After the Education Session)	N/A	88%

The analysis shows an overall improvement in respondents' perceptions of the health benefits of consuming pineapple as part of preventive health behavior. After the educational session, respondents demonstrated a stronger belief in the role of pineapple in maintaining health, reflecting increased awareness of pineapple as a natural source of antioxidants. This finding suggests that the educational intervention was effective in shaping positive health perceptions related to functional food consumption.

In addition, the emergence of positive intentions among 88% of respondents to increase their consumption of antioxidant-rich fruits after the session demonstrates that the intervention not only influenced cognitive aspects but also stimulated changes in the conative aspect, namely behavioral intention. These findings confirm that the educational activity was effective in encouraging the adoption of healthy lifestyle behaviors, particularly the increased consumption of functional foods that may offer protective benefits against free radical exposure.

Practical Understanding of Pineapple Processing

This section discusses the respondents' level of understanding regarding pineapple processing practices that may affect its antioxidant content. The evaluation was conducted through a post-test to assess the extent to which the educational session improved respondents' knowledge of appropriate processing methods, the healthiest forms of consumption, and their interest in trying healthier pineapple-based preparations. A summary of these assessment results is presented in Table 4 below.

Question	Correct Answer	Percentage (Post-test)
Does the processing method affect antioxidant levels?	Yes	**88%**
What is the healthiest way to consume it?	Eaten fresh	**94%**
Interested in trying healthier pineapple preparations?	Yes	**91%**

The evaluation results demonstrate that respondents gained a good understanding of how processing methods affect antioxidant levels and recognized the healthiest way to preserve pineapple's nutritional quality. Moreover, their high interest in trying healthier pineapple preparations suggest that the educational intervention may have a lasting impact on promoting better dietary practices.

DISCUSSION

The findings of this study indicate a significant increase in respondent knowledge after participating in the educational outreach program. Their understanding of the definition and sources of free radicals improved substantially, which an increase of up to 57%. This improvement is crucial, as awareness of the risks associated with free radicals is the first step toward adopting preventive behaviors, including antioxidant consumption. Recent studies emphasize that increased health knowledge plays a central role in shaping individuals' readiness to engage in preventive actions (Nutbeam & Lloyd, 2021).

In the aspect to antioxidants, all respondents achieved an optimal level of understanding (100%) in the post test regarding the definition of antioxidants as substances that protect the body from free radicals. This demonstrates that the educational program effectively conveyed key preventive health concepts. Furthermore, knowledge about pineapple as a source of antioxidants also increases, from 63% to 97%. A similar improvement (41%) was observed in respondents understanding of the comprehensive benefits of pineapple, such as enhancing immunity, helping to combat free radicals, and supporting digestive health. This outcome is consistent with recent nutrition education studies, which report that linking abstract health concepts with locally available and familiar food sources significantly improves knowledge retention and comprehension (Silva *et al.,* 2023)

The significant improvement in knowledge also positively influenced respondents' perceptions and behavioral intentions. The proportion of respondents who believed that consuming pineapple contributes to maintaining health increased from 78% in the pre-test to 97% in the post-test. This positive shift in perception is an important prerequisite for behavior change, aligning with the principles of the Health Belief Model, which posits that an individual's belief in the benefits of a health-related action is a key factor driving the adoption of healthy behavior. Additionally, respondents' intention to increase their consumption of antioxidant-rich fruits was notably high, with 88% expressing interest after the outreach activity. This strong behavioral intention indicates that the educational intervention not only enhanced cognitive understanding but also succeeded in stimulating respondents' internal motivation to apply this knowledge in their daily dietary practices.

Respondents also demonstrated a good level of understanding regarding practical aspects of pineapple processing. The majority (94%) correctly identified that consuming fresh pineapple is the most effective method to preserve antioxidant content. This understanding is important, as antioxidant components—including vitamin C and certain enzymes—are sensitive to heat and prolonged processing (Arampath & Dekker, 2020). Moreover, the high interest (91%) in preparing healthier pineapple-based foods at home suggests the potential for longer term behavioral adoption. Similar findings have been reported in community nutrition education programs, where practical knowledge significantly increased the likelihood of translating intention into action.

Despite the effectiveness of the outreach program in improving knowledge and behavioral intention, several limitations should be acknowledged. This study assessed behavioral intention rather than actual long term behavioral changes, such as sustained fruit

consumption following the intervention. The predominance of respondents from the productive age group (18-55 years old) with relatively higher educational backgrounds may have influenced their capacity to receive and understand health information, thereby limiting the generalizability of the findings. In addition, the effectiveness of the program also has been influenced by the educational media used, namely power point presentation slides delivered through lectures and printed leaflets, which were appropriate for respondent characteristics but my require adaptation for populations with different demographic profiles.

CONCLUSION

The outreach program on antioxidants and the benefits of pineapple proved effective in increasing respondent health knowledge, as evidenced by the significant improvement in the percentage of correct answers in the knowledge questionnaire- an increase of more than 40% between the pre-test and post-test. This improvement includes a stronger foundational understanding of the dangers of free radicals and the role of antioxidant as protective agents for the body. The success in enhancing cognitive aspects is also reflected in the change in behavioral intentions, where the majority of respondents (88%) expressed interest in increasing their consumption of antioxidant rich fruits, supported by a rise in confidence regarding the health benefits of pineapple, which reached 97%.

In addition, respondents demonstrated good understanding of the practical aspects of pineapple consumption, particularly that consuming it fresh is the most optimal method for preserving its antioxidant content. These findings reinforce those educational interventions based on local commodities, such as pineapple, have strong potential to serve as effective and sustainable health promotion strategies.

REFERENCES

Aaronson, P. I., Ward, J. P., & Connolly, M. J. (2020). *The cardiovascular system at a glance*. John Wiley & Sons.

Agung, P. A. (2025). Edukasi Masyarakat tentang Manfaat Antioksidan dari Daun Pegagan dan Daun Mint sebagai Upaya Pencegahan Stres Oksidatif dan Peningkatan Kesehatan. *LOSARI: Jurnal Pengabdian Kepada Masyarakat*, *7*(2), 215-221.

Annisa, S. N., & Kushargina, R. (2021). SIASAT (Edukasi Bahan Pangan Sumber Antioksidan) untuk Jaga Imunitas Tubuh di Masa Pandemi Covid-19. *Jurnal Abmas Negeri (JAGRI)*, *2*(2), 46-51.

Budiatin, A. S., Ratri, D. M., Rahmawati, A., & Aryani, T. (2025). Pharmacists' Role in Enhancing Community Awareness of Cancer Prevention and Early Detection. *JURNAL FARMASIMED (JFM)*, *8*(1), 63-70.

Chandimali, N., Bak, S. G., Park, E. H., Lim, H. J., Won, Y. S., Kim, E. K., ... & Lee, S. J. (2025). Free radicals and their impact on health and antioxidant defenses: A review. *Cell death discovery*, *11*(1), 19.

Chaudhary, P., Janmeda, P., Docea, A. O., Yeskaliyeva, B., Abdull Razis, A. F., Modu, B., ... & Sharifi-Rad, J. (2023). Oxidative stress, free radicals and antioxidants: Potential crosstalk in the pathophysiology of human diseases. *Frontiers in chemistry*, *11*, 1158198.

Coughlin, S. S. (2018). Oxidative stress, antioxidants, physical activity, and the prevention of breast cancer initiation and progression. J. Environ. Health Sci. 4 (2), 55–57. doi:10.15436/2378-6841.18.2013

Demirci-Çekiç, S., Özkan, G., Avan, A. N., Uzunboy, S., Çapanoğlu, E., & Apak, R. (2022). Biomarkers of oxidative stress and antioxidant defense. *Journal of pharmaceutical and biomedical analysis*, *209*, 114477.

Gul, A., Khan, S., Arain, H., Khan, H., Ishrat, U., & Siddiqui, M. (2022). Three-phase partitioning as an efficient one-step method for the extraction and purification of bromelain from pineapple crown waste. *Journal of Food Processing and Preservation*, *46*(11), e16973.

Gustina, I., & Dita, P. S. (2021). Causing Factors of Degenerative Disease towards Elderly Women. *Jurnal Ners dan Kebidanan (Journal of Ners and Midwifery)*, *8*(1), 064-070.

Jenitha, A. X., & Anusuya, A. (2016). Phytochemical screening and in vitro antioxidant activity of ananas comosus. *J Research Pharma Pharmacotherap*, *5*(2), 162-169.

Juliastuti, H., Yuslianti, E. R., Rakhmat, I. I., Handayani, D. R., Faramayudha, F., Riyanti, S., ... & Adinugraha, I. M. (2024). Penyuluhan Antioksidan dari Tumbuhan untuk Kesehatan Pada Masyarakat Kampung Adat Cireundeu Kota Cimahi. *Jurnal Abdimas Kartika Wijayakusuma*, *5*(2), 252-261.

Kobayashi H., Higashiura Y., Shigetomi H., Kajihara H. Pathogenesis of endometriosis: the role of initial infection and subsequent sterile inflammation (Review) Molecular Medicine Reports. 2014;9(1):9–15. doi: 10.3892/mmr.2013.1755.

Kotha, R. R., Tareq, F. S., Yildiz, E., & Luthria, D. L. (2022). Oxidative stress and antioxidants—A critical review on in vitro antioxidant assays. Antioxidants, 11(12), 2388.

Kusumawardhani, S., & Pujiastuti, A. (2025). Aktivitas Antioksidan Clitoria Gummy Sari Bunga Telang (Clitoria ternatea L.). *Jurnal Ilmiah Biosaintropis (Bioscience-Tropic)*, *10*(2), 108-118.

Le Turc, N., Silva, A. J., Florença, S. G., Raposo, A., Gonçalves, J. C., Lima, M. J., ... & Guiné, R. P. (2024). Consumer knowledge about dietary relevance of fruits and vegetables: a study involving participants from Portugal and France. *Nutrients*, *16*(2), 287.

Liana, Y., & Herlina, H. (2023). Peningkatan Pengetahuan Dan Motivasi Melalui Edukasi Kesehatan Tentang IVA Test Pada Agreget Komunitas Ibu Usia Reproduktif. *Jurnal Pengabdian Masyarakat Bangsa*, *1*(6), 520-524.

Mahemba, Y. S., Soegiantoro, D. H., & Rawar, E. A. (2025). Persepsi Masyarakat Indonesia Terhadap Peran Apoteker Komunitas Dalam Promosi Dan Edukasi Kesehatan Berdasarkan Pekerjaan. *Jurnal Kesehatan Ilmiah Indonesia (Indonesian Health Scientific Journal)*, *10*(2).

Pereira, P. H. F., Ornaghi Jr, H. L., Arantes, V., & Cioffi, M. O. H. (2021). Effect of chemical treatment of pineapple crown fiber in the production, chemical composition, crystalline structure, thermal stability and thermal degradation kinetic properties of cellulosic materials. *Carbohydrate Research*, *499*, 108227.

Satriawan, D. (2022). Gambaran Kebiasaan Merokok Penduduk Di Indonesia. *Jurnal Litbang Sukowati: Media Penelitian Dan Pengembangan*, *5*(2), 51-58..

Setiadi, A. P., Wibowo, Y., Brata, C., Halim, S. V., Wardhani, S. A., & Sunderland, B. (2020). The role of pharmacists in community education to promote responsible self-medication in Indonesia: an application of the spiral educational model. *International Journal of Clinical Pharmacy*, *42*(4), 1088-1096.

Verawati, V., Fitrianda, E., & Wahyuni, R. (2025). Edukasi Sumber Alami Antioksidan dan Manfaatnya bagi Kesehatan di Desa Sungai Lantuang. *Jurnal Pengabdian Masyarakat (ABDIRA)*, *5*(3), 712-718.

Wang, X. Q., Wang, W., Peng, M., & Zhang, X. Z. (2021). Free radicals for cancer theranostics. *Biomaterials*, *266*, 120474.

Winahyu, N., Maharani, N., Helilusiatiningsih, N., Choirina, V. N., & Angesti, S. D. (2022). Perencanaan Bisnis Produk Olahan Berbasis Komoditas Nanas di Kabupaten Kediri. *Jurnal Pertanian Cemara*, *19*(1), 65-76.

Yunieswati, W., Kushargina, R., & Rizqiya, F. (2022). Edukasi gizi berbasis teknologi untuk peningkatan pengetahuan gizi dan antioksidan pada remaja. *Jurnal Kedokteran dan Kesehatan*, *18*(1), 69-77.