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Effectiveness of Game-Based Education on Knowledge Levels among Hypertensive Patients at Public Health Centre in Yogyakarta

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ABSTRACT

Background: Hypertension is a significant risk factor for cardiovascular and cerebrovascular diseases and is the focus of ongoing global research. In Indonesia, it is a leading cause of death and ranks among the top ten health issues in Yogyakarta. This study addresses the problem of inadequate knowledge about hypertension, which may result in poor self-care behaviour among patients. Several references suggest that using educational games enhances hypertensive patients' knowledge effectively. Therefore, this research aims to determine the effectiveness of game-based education interventions on knowledge levels among hypertensive patients. **Methods:** A quantitative analytical descriptive study was conducted involving forty-eight hypertensive patients who were purposively selected from a public health centre in Yogyakarta. These patients participated in an educational intervention for one week. **Results:** Statistical analysis using a paired t-test revealed a significant difference in the knowledge of hypertensive patients before and after the educational game intervention in the intervention group (p=0.00< 0.05). Furthermore, an independent t-test indicated a significant difference in knowledge levels of hypertensive patients after a game-based education intervention between the intervention and control groups (p=0.00<0.05). **Conclusion:** The study concludes that hypertension education delivered through games for at least one week can effectively enhance the knowledge levels of hypertensive patients. Therefore, it suggested that educators continually provide educational interventions to improve hypertension patients' knowledge. It has implications for hypertension self-care practices.

Keywords: Game Education; Hypertension Knowledge; Hypertension

INTRODUCTION

Hypertension, or high blood pressure, is a significant global health issue. It can lead to various complications affecting the cardiovascular and cerebrovascular systems, kidneys, and other conditions (Sivamani *et al*., 2025). Often referred to as the "silent killer", hypertension may not present any symptoms, yet it can cause premature death (WHO, 2023a). The increasing prevalence of hypertension each year is a significant concern. According to WHO data, there are approximately 1.28 billion adults with hypertension worldwide, but only 46% are aware of their condition (WHO, 2023b). In Indonesia, the prevalence of hypertension remains high at 30.8%, making it the fourth leading risk factor for death, accounting for 10.2% of mortality (Health Development Policy Agency, 2023). In Yogyakarta, the situation is even more concerning, with a hypertension prevalence of 31.8%, which is higher than the national average and ranks among the top ten diseases (Ministry of Health of the Republic of Indonesia, 2024; Health Development Policy Agency, 2023).

One of the critical issues in managing hypertension is patients' insufficient knowledge about the condition, which results in a lack of self-care abilities. Self-care is essential for individuals with hypertension, as it enables them to manage complications and reduce the risk of severe outcomes, including death. To effectively engage in self-care, patients must possess a solid understanding of hypertension. Unfortunately, many patients lack this essential knowledge. A study revealed that of 90 patients with hypertension, over half demonstrated only sufficient or insufficient understanding of their condition, with 33.6% and 35.6%, respectively (Isnaini &

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Hermawati, 2024). Typical areas of misunderstanding include the definition, signs and symptoms, treatment options, necessary lifestyle changes, and potential complications of hypertension (Pristianty *et al*., 2023). This lack of knowledge significantly hinders effective self-care behaviours. The government has implemented various strategies to raise awareness among hypertension patients; however, control of the condition remains suboptimal. This gap in public understanding of hypertension highlights the need for interventions aimed at increasing knowledge through accessible, affordable, engaging, and timely methods.

Hypertension education through games is an effective intervention for increasing knowledge among patients with hypertension. Educational games deliver important information using smartphone technology, making them particularly popular with adults. Previous studies have shown that game-based education can enhance awareness of healthy lifestyles and encourage activities that promote health (Azizi-Soleiman *et al*., 2023). This game-based educational method offers several advantages: it is easily accessible, affordable, enjoyable, and can be played anytime and anywhere, catering to the needs of hypertensive patients. Technology-enhanced education has proven effective in improving the knowledge of hypertension patients (Pujiastuti, Aljaberi & Sansuwito, 2023). Smartphone usage has become widespread among adults in the Public Health Centre area, presenting a new opportunity to innovate digital health promotions to increase the hypertensive patients' knowledge levels. It has not yet been implemented in the Public Health Centre. Therefore, this study aims to determine the effectiveness of game-based education on knowledge levels among hypertensive patients.

METHODOLOGY

Study Design

This research adopted a quantitative descriptive design utilising a quasi-experimental approach with a control group. The primary objective was to evaluate the effectiveness of game-based education on the knowledge levels of hypertensive patients.

Study Setting

The study was conducted at a public health centre in Yogyakarta, Indonesia. The intervention took place over a duration of one week.

Population and Sampling

The study population comprised hypertensive patients registered at the selected health centre. A total of 48 respondents were recruited using purposive sampling based on the following:

Inclusion Criteria:

The inclusion criteria for the study were as follows: participants had to be diagnosed with hypertension, aged 55 years or younger, and possess the ability to use and own a personal smartphone.

Exclusion Criteria:

The exclusion criteria included patients who were acutely ill during the data collection period and individuals residing outside the jurisdiction of the health centre.

Sample Size Determination

The sample size was determined using G*Power version 3.1.9.2 with an alpha of 0.05, power of 0.8, and an effect size of 0.8, resulting in 48 participants. Purposive sampling was used to select hypertensive patients aged ≤55 years who owned smartphones. Patients who were ill or lived outside the study area were excluded.

Intervention

The intervention group received a one-week game-based hypertension education programme via smartphone, while the control group received routine education from the health centre. Both groups completed

a pre-test and post-test using the Hypertension Knowledge Level Scale (HK-LS) to assess changes in knowledge.

Data Collection Instruments

Data on participants' hypertension-related knowledge were collected using the Hypertension Knowledge Level Scale (HK-LS) developed by Erkoc *et al*. (2012) and validated for the Indonesian context by Ernawati, Fandinata & Permatasari (2020).

Procedure

Pre-test: Both groups completed the HK-LS questionnaire to assess baseline knowledge.

Intervention: The intervention group used the educational game for one week.

Post-test: The same knowledge questionnaire was administered to both groups one week later.

Data Analysis

Statistical analysis was conducted using:

Paired *t*-tests: To compare pre- and post-intervention knowledge levels within the intervention group.

Independent *t*-tests: To compare post-test knowledge levels between the intervention and control groups.

All statistical analyses were performed with a significance level set at $p < 0.05$.

Ethical Consideration

The research obtained ethical clearance from the research ethics committee at Panti Rapih Hospital with reference number 102/SKEPK-KKE/VII/2024 on 19th July 2024.

RESULTS

The study examined the characteristics of respondents, including age, gender, duration of hypertension, and baseline blood pressure values. The mean age of the participants was 49.1 years, with a standard deviation of 5.48, indicating a wide age distribution ranging from 35 to 56 years. The majority of respondents, 47 (97.7%), were female, suggesting that women may be at higher risk of experiencing hypertension compared to men. Additionally, the mean duration of hypertension among respondents was 2.2 years, with a standard deviation of 3.14, indicating that this group is relatively new to managing hypertension and may benefit from educational resources on the condition. In baseline blood pressure levels, the mean systolic pressure was 135.29 mmHg, with a standard deviation of 15.42, while the mean diastolic pressure was 82.6 mmHg, with a standard deviation of 9.41.

According to Table 1, there was a statistically significant improvement in hypertension knowledge, with a mean difference of 3.45 (95% CI 1.84–5.07; $p = 0.000 < 0.05$) observed before and after the hypertension game education intervention. This indicates that the game-based education intervention significantly increased the knowledge levels of hypertensive patients regarding their condition.

Table I: Mean Difference of Intervention Groups

Variable	Before Intervention (n=48)		After Intervention (n=48)		*p*-Value	Mean Difference (CI 95%)
	Mean	SD	Mean	SD		
Hypertension Knowledge	38.04	3.83	41.50	2.02	0.000	3.45 (1.84–5.07)

According to Table 2, after one week of intervention involving a hypertension game-based education, there was a statistically significant difference in knowledge levels between the intervention and the control groups. The mean difference was 3.54 (95% CI: 1.69 to 5.38; $p < 0.0005$). This indicates that the hypertension game-based education intervention effectively improved the knowledge levels of patients with hypertension compared to those in the control group.

Table 2: Mean Difference of Both Groups

Variable	Intervention Group (n=48)		Control Group (n=48)		*p*-Value	Mean Difference (CI 95%)
	Mean	SD	Mean	SD		
Hypertension knowledge	41.5	2.02	37.95	3.96	0.000	3.54 (1.69–5.38)

DISCUSSION

Based on the characteristics of the respondents, the mean (SD) age is 49.1 (5.48) years. These results suggest that hypertension often develops in younger individuals, particularly those under the age of 55. Age is a significant factor in hypertension, as it impacts the elasticity of blood vessels and the hormonal regulation of blood pressure (Livana & Basthomi, 2020; Rohmana, Rochayati & Sansuwito, 2024). Many adults do not adhere to a healthy lifestyle, which is crucial for managing hypertension. They need to understand healthy living practices, especially for those with hypertension.

Additionally, the data indicates that respondents have experienced hypertension for less than five years. This raises the assumption that they may lack a comprehensive understanding of the condition, which can lead to suboptimal awareness and control of their hypertension. According to Labata *et al*. (2019), having hypertension for less than three years is an independent predictor of poor adherence to a low-salt diet and medication regimens. Supporting this, Sayekti, Kristina & Widyakusuma (2018) found that patients with hypertension for less than five years often struggle with disease literacy and management. Health literacy is a significant barrier to enabling individuals to lead healthy lives (Murdaug, Parsons and Pender, 2019). This highlights the importance of providing intensive education to hypertensive patients so they can acquire accurate knowledge about their condition and effectively manage their hypertension (Maluwa *et al*., 2025).

This study revealed a statistically significant difference in hypertension knowledge before and after the educational game intervention. Understanding hypertension is crucial for hypertensive patients, as it determines their ability to control their blood pressure effectively. Participants in this study gained a comprehensive understanding of hypertension, including its definition, treatment options, dietary considerations, lifestyle modifications, stress management, and the risks associated with smoking and alcohol consumption. Hypertension knowledge encompasses both the theoretical understanding of the condition and the self-care practices required for effective management, such as adherence to medical treatments, maintaining a healthy lifestyle, monitoring one's diet, and recognising potential complications (Erkoc *et al*., 2012; Ernawati, Fandinata & Permatasari, 2020). Efforts to enhance the knowledge of hypertensive patients are currently a priority for the Indonesian government in addressing hypertension. The primary strategy in tackling this issue involves raising public awareness about the risk factors associated with hypertension (Ibrahim & Al-Nuaimy, 2024). This includes comprehensive outreach programmes on the importance of a healthy lifestyle, early detection, and the provision of quality healthcare services, including diagnostic evaluations and management protocols, to ensure better control of hypertension (WHO, 2024). Thus, education emerges as a vital strategy to improve awareness of hypertension. Enhancing knowledge about hypertension can empower patients to engage in effective self-care practices, ultimately leading to better health outcomes. Previous research indicates that higher levels of knowledge and positive attitudes correlate with increased preventive behaviours (Kim, Shin & Lee, 2022).

Knowledge has an indirect relationship with behaviour (Imtichan, Tamtomo & Sulaeman, 2019). Previous studies indicate that individuals with good knowledge are more likely to engage in self-care practices (Melkamu, Berhe & Handebo, 2021). This is the primary objective of hypertension education. Knowledge is a crucial component that influences an individual's ability to practice self-care (Mashuri *et al*., 2024). Research of Fikriana *et al.* (2020) supports this, showing that knowledge significantly affects the self-care behavior of hypertensive patients (Fikriana *et al.*, 2020). Similar studies have also found that knowledge impacts the self-care process in hypertensive patients (Gil & Oh, 2018). Additionally, other research highlights the necessity of knowledge for effective self-care (Ademe, Aga & Gela, 2019). By increasing the knowledge of hypertensive patients, healthcare professionals aim to enhance patients' awareness of the

disease and the risk factors to avoid, which is essential for managing their health (Cabral *et al*., 2022).

This study revealed a significant difference in hypertension knowledge between the intervention and the control groups. This suggests that the educational game intervention increases the understanding of patients with hypertension. Using educational games for hypertension education offers several advantages: it is easily accessible, affordable, engaging, and not limited by time or space. Hypertensive patients can study hypertension-related material whenever they have free time, and this educational game can even be enjoyed as a family activity. Additionally, this hypertension educational game positively affects family relationships, fostering a caring environment where family members can understand the self-care needs of patients. Family support is crucial for effectively managing hypertension (Isnaini *et al*., 2025). The research demonstrates that educational interventions implemented over one week significantly enhance patient knowledge about hypertension. Previous studies have indicated that educational interventions using various smartphone tools have also improved knowledge effectively (Huda, Chowhan & Seervi *et al*., 2025). Research indicates a notable difference in the level of knowledge regarding hypertension self-management following educational interventions delivered through smartphone applications (Li *et al*., 2019). This finding is supported by the assertion that education via smartphone apps can enhance information delivery, reminders, feedback, monitoring, and communication (Han & Lee, 2018). According to Raupach *et al.* (2021), educational games can increase patients' awareness, enabling them to make better decisions about managing their disease. Educational interventions focused on hypertension have been shown to improve the knowledge of patients with high blood pressure significantly (Schaffler *et al*., 2018). In line with Orem's self-care theory, knowledge constitutes a component of self-care agency, while education is a supportive educational systemWill be--(Alligood, 2018). Therefore, using educational games for hypertension education represents a nursing agency to enhance self-care knowledge (Goes *et al*., 2020).

Limitation

Research has shown that patient knowledge is measured quantitatively, which limits the identification of hypertensive patients' knowledge quality. An in-depth study of hypertensive patients' knowledge following educational interventions using game-based methods would provide valuable insights into their experiences after the intervention. It is recommended for future researchers to conduct a qualitative study of the hypertensive patients' knowledge.

CONCLUSION

Education about hypertension through games for at least one week has proven effective in enhancing knowledge levels regarding this condition. This includes understanding hypertension, recognising its signs and symptoms, exploring treatment options, adopting a healthy lifestyle and identifying potential complications. Based on these research findings, it is suggested that hypertension educators and nurses consistently provide education to improve the knowledge of patients with hypertension. Utilising educational games can serve as an effective nursing intervention to improve hypertension knowledge among patients. Future research needs to qualitatively explore the hypertensive patients' knowledge and determine the effectiveness of this intervention on hypertensive patients' self-care behaviour.

Conflict of Interest

The authors declare that they have no conflict of interests.

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REFERENCES

Ademe, S., Aga, F., & Gela, D. (2019). Hypertension self-care practice and associated factors among patients in public health facilities of Dessie town, Ethiopia. *BMC Health Services Research, 19*(1), 1–9. https://doi.org/10.1186/s12913-019-3880-0

Alligood, M. R. (2018). *Nursing theorists and their work* (9th ed.). Elsevier. Retrieved from: https://dehaghan.iau.ir/file/download/page/1673867738-nursing-theorists-and-their-wor-martha-raile-alligood.pdf. Accessed on 12th December 2023.

Azizi-Soleiman, F., Heidari-Beni, M., Hemati, Z., & Kelishadi, R. (2023). Designing and developing an educational-therapeutic game for improving healthy lifestyle in children and adolescents. *International Journal of Computer Games Technology, 2023*(1). https://doi.org/10.1155/2023/9897496

Cabral, A. C., Lavrador, M., Fernandez-Llimos, F., Castel-Branco, M., & Figueiredo, I. V. (2022). Evaluation of a sample of Portuguese hypertensive patients' knowledge about hypertension and its influence on their beliefs and adherence to therapy. *Revista Portuguesa de Cardiologia, 41*(5), 361-367. https://doi.org/10.1016/j.repc.2021.02.020

Erkoc, S. B., Isikli, B., Metintas, S., & Kalyoncu, C. (2012). Hypertension Knowledge-Level Scale (HK-LS): a study on development, validity and reliability. *International Journal of Environmental Research and Public Health, 9*(3), 1018-1029. https://doi.org/10.3390/ijerph9031018

Ernawati, I., Fandinata, S. S., & Permatasari, S. N. (2020). Translation and validation of the Indonesian version of the hypertension knowledge-level scale. *Open Access Macedonian Journal of Medical Sciences, 8*(E), 630-637. https://doi.org/10.3889/OAMJMS.2020.5152

Fikriana, R., Nurbadriyah, W. D., Kodriyah, L., & Rosalina, R. (2020). Analysis of diet pattern ability setting in hypertension patients with self-care theory approach. *International Journal of Psychosocial Rehabilitation, 24*(7), 9145–9150. https://doi.org/10.37200/IJPR/V24I7/PR270907

Gil, E., & Oh, H. (2018). Testing a middle-range theory of self-care of chronic illness: A validation for Korean adult patients with severe hypertension. *Journal of Korean Academy of Nursing, 48*(5), 521-533. https://doi.org/10.4040/jkan.2018.48.5.521

Goes, M., Lopes, M. J., Oliveira, H., Fonseca, C., & Marôco, J. (2020). A nursing care intervention model for elderly people to ascertain general profiles of functionality and self-care needs. *Scientific Reports, 10*(1). https://doi.org/10.1038/s41598-020-58596-1

Han, M., & Lee, E. (2018). Effectiveness of mobile health application use to improve health behavior changes: A systematic review of randomized controlled trials. *Healthcare Informatics Research, 24*(3), 207–226. https://doi.org/10.4258/hir.2018.24.3.207

Health Development Policy Agency. (2023). Survei Kesehatan Indonesia (SKI) 2023 [Indonesia Health Survey 2023]. Kemenkes BKPK. Retrieved from https://drive.google.com/file/d/1rjNDG_f8xG6-Y9wmhJUnXhJ-vUFevVJC/view. Accessed on 10th December 2024.

Huda, R. K., Chowhan, R. S., & Seervi, D. (2025). Effectiveness of mobile health technology-enabled interventions to improve management and control of hypertension and diabetes in India-a systematic review. *Preventive Medicine Reports*. https://doi.org/10.1016/j.pmedr.2025.103094

Ibrahim, R., & Al-Nuaimy, H. M. H. (2024). Prevalence and determination of hypertension among diabetes mellitus patients attending primary Health Care Centres. *The Malaysian Journal of Nursing (MJN), 15*(4), 23-32. https://doi.org/10.31674/mjn.2024.v15i04.004

Imtichan, S. N., Tamtomo, D., & Sulaeman, E. S. (2019). Path Analysis: Application of Health Belief Model on the determinants of clean and healthy behavior among elderly with hypertension. *Journal of Health Promotion and*

Behavior, 4(2), 110-120. https://doi.org/10.26911/thejhpb.2019.04.02.03

Isnaini, & Hermawati. (2024). Hubungan Tingkat Pengetahuan Hipertensi dengan Upaya Pengendalian Hipertensi di Puskesmas Ngemplak Boyolali [Relationship between hypertension knowledge level and hypertension control efforts at Ngemplak Boyolali Health Center]. *Indonesian Journal of Public Health, 2*(2), 187–197. https://jurnal.academiacenter.org/index.php/IJOH/article/view/329. Accessed on 17th December 2023.

Isnaini, N., Dewi, F. T., Madyaningrum, E., & Noviana, U. (2025). Family-centered education for older adults with hypertension: A scoping review. *Iranian Journal of Public Health, 54*(1). https://doi.org/10.18502/ijph.v54i1.17573

Kim, H. Y., Shin, S. H., & Lee, E. H. (2022). Effects of health belief, knowledge, and attitude toward COVID-19 on prevention behavior in health college students. *International Journal of Environmental Research and Public Health, 19*(3). https://doi.org/10.3390/ijerph19031898

Labata, B. G., Ahmed, M. B., Mekonen, G. F., & Daba, F. B. (2019). Prevalence and predictors of self care practices among hypertensive patients at Jimma University Specialized Hospital, Southwest Ethiopia: Cross-sectional study. *BMC Research Notes, 12*, 1-8. https://doi.org/10.1186/s13104-019-4125-3

Li, T., Ding, W., Li, X., & Lin, A. (2019). Mobile health technology (WeChat) for the hierarchical management of community hypertension: protocol for a cluster randomized controlled trial. *Patient preference and adherence, 13*, 1339–1352. https://doi.org/10.2147/PPA.S215719

Livana, P. H., & Basthomi, Y. (2020). Triggering factors related to hypertension in the City of Kendal, Indonesia. *Arterial Hypertension, 24*(4), 181–191. https://doi.org/10.5603/AH.A2020.0024

Maluwa, C., Kapira, S., Chuljerm, H., Parklak, W., & Kulprachakarn, K. (2025). Impact of health education on knowledge retention among caregivers of hypertensive patients: A prospective cross-sectional study in rural Malawi. *PloS One, 20*(2). https://doi.org/10.1371/journal.pone.0317684

Mashuri, Y. A., Widyaningsih, V., Premanawasti, A., Koot, J., Pardoel, Z., Landsman-Dijkstra, J., ... & Probandari, A. (2024). Differences in knowledge, attitude, and practice regarding hypertension by access to a community-based screening program (POSBINDU): A cross-sectional study from four districts in Indonesia. *Plos One, 19*(5). https://doi.org/10.1371/journal.pone.0303503

Melkamu, L., Berhe, R., & Handebo, S. (2021). Does patients' perception affect self-care practices? The perspective of health belief model. Diabetes, Metabolic Syndrome and Obesity: T*argets and Therapy, 14*, 2145–2154. https://doi.org/10.2147/DMSO.S306752

Ministry of Health of the Republic of Indonesia. (2024, June 28). *Profil Kesehatan Indonesia 2023 [Indonesia Health Profile 2023]*. Kemenkes. Retrieved from: https://kemkes.go.id/id/indonesia-health-profile-2023. Accessed on 20th December 2024.

Murdaug, C. L., Parsons, M. A., & Pender, N. J. (2019). *Health Promotion in Nursing Practice* (8th ed.; Eighth). Pearson Education, Inc. Retrieved from:https://www.pearsonhighered.com/assets/preface/0/1/3/4/0134754085.pdf. Accessed on 8th December 2024.

Pristianty, L., Hingis, E. S., Priyandani, Y., & Rahem, A. (2023). Relationship between knowledge and adherence to hypertension treatment. *Journal of Public Health in Africa, 14*(Suppl 1). https://doi.org/10.4081/jphia.2023.2502

Pujiastuti, T., Aljaberi, M. A., & Sansuwito, T. (2023). Effectiveness of android-based hypertension self-care education to improve blood pressure control among hypertensive patients at Yogyakarta: Study Protocol. *Malaysian Journal of Medicine and Health Sciences, 19*(1), 354–359. https://doi.org/10.47836/mjmhs19.1.44

Raupach, T., de Temple, I., Middeke, A., Anders, S., Morton, C., & Schuelper, N. (2021). Effectiveness of a serious game addressing guideline adherence: cohort study with 1.5-year follow-up. *BMC Medical Education, 21*(1),

1–9. https://doi.org/10.1186/s12909-021-02591-1

Rohmana, O., Rochayati, A. S., & Sansuwito, T. B. (2024). Effects of ergonomic exercises on systolic and diastolic blood pressure of hypertensive elderly in Sitopeng Cirebon, Indonesia. *The Malaysian Journal of Nursing (MJN), 16*(1), 234-242. https://doi.org/10.31674/mjn.2024.v16i01.024

Sayekti, D. A., Kristina, S. A., & Widyakusuma, N. N. (2018). Literacy of cold medication labeling among patient with hypertension in Indonesia. *Asian Journal of Pharmaceutics, 2018*(4), 1495–1500. https://doi.org/10.22377/ajp.v12i04.2954

Schaffler, J., Leung, K., Tremblay, S., Merdsoy, L., Belzile, E., Lambrou, A., & Lambert, S. D. (2018). The effectiveness of self-management interventions for individuals with low health literacy and/or low income: A descriptive systematic review. *Journal of General Internal Medicine, 33*(4), 510–523. https://doi.org/10.1007/s11606-017-4265-x

Sivamani, C., Saya, G. K., Ulaganeethi, R., & Chinnakali, P. (2025). Self-care practices on hypertension: prevalence and predictors in Puducherry, South India. *Clinical Epidemiology and Global Health, 31*. https://doi.org/10.1016/j.cegh.2024.101883

World Health Organization (WHO). (2023a). *Hypertension*. World Health Organization. Retrieved from: https://www.who.int/news-room/fact-sheets/detail/hypertension. Accessed on 20th August 2023.

World Health Organization (WHO) (2023b). *Global report on hypertension: The race against a silent killer*. Retrieved from https://www.who.int/publications/i/item/9789240081062. Accessed on 9th September 2023.

World Health Organization (WHO) (2024). *Measure your blood pressure accurately, control it, live longer*. Retrieved from: https://www.who.int/srilanka/news/detail/17-05-2024-world-hypertension-day-2024--measure-your-blood-pressure-accurately--control-it--live-longer. Accessed on 20th December 2023.