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Community Service for Improving Health Services and Early Detection of Hypertension Complications in the Elderly in Bulak Village, Surabaya

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ABSTRACT Bulak Village in Surabaya has a population of approximately 22,330 people, with a relatively high proportion of elderly residents. The elderly are a vulnerable group for hypertension and anemia. According to the 2023 Indonesian Health Survey, the national prevalence of hypertension reached 30.8%, and East Java is one of the provinces with the highest rate (36%). To address this issue, a team of lecturers and staff from the Surabaya Ministry of Health Polytechnic conducted community service at the elderly health post in the Bulak urban village area of Surabaya. Activities include socialization, education, and blood pressure, hemoglobin, and hematocrit checks, targeting 49 elderly individuals. The results show that 36.7% of the elderly have stage 1 hypertension and 8.2% have stage 2 hypertension. A total of 51% of respondents have anemia (low Hb), and 67.3% have below-normal hematocrit levels. This condition reflects weak early detection and a lack of awareness regarding the importance of routine health checkups for the elderly. Factors contributing to low knowledge among the elderly include limited examination tools and costs, as well as the suboptimal role of community health posts in disease prevention and control. Therefore, continuous education, strengthening elderly health posts, and the involvement of families and communities are needed to support healthy lifestyles and regular treatment for the elderly.

INDEX TERMS Elderly, Hypertension, Hemoglobin, Hematocrit.

I. INTRODUCTION

The Bulak sub-district in Surabaya has a population of approximately 22,330 people (11,146 males; 11,184 females), with a growing proportion of elderly individuals in line with national population aging trends. The elderly are vulnerable to hypertension and anemia, which, if left untreated, increase morbidity, disability, and healthcare costs [1]. At the sub-district level, there are several primary healthcare facilities, but the coverage of elderly screening community health posts /routine checkups) is not yet uniform. Priority interventions: increasing blood pressure, hemoglobin, and hematocrit screening at elderly Integrated Service Post; empowering cadres and families; and strengthening referral and recording mechanisms. Bulak Village in Surabaya City has 4 healthcare facilities, and the 2023 Indonesian Health Survey recorded a national hypertension prevalence of 30.8%. East Java is among the provinces with a high prevalence, reaching 36% in some provincial reports. The report indicates that hypertension is also a major problem for the elderly in Bulak, considering the demographic and urban characteristics [2]. Many elderly people experience a decrease in hemoglobin levels due to malnutrition, chronic diseases, or hidden bleeding. Hemoglobin is a protein found in red blood cells. Hemoglobin plays many important roles in the body, one of which is binding and distributing oxygen throughout the body. Therefore, it is important to maintain normal hemoglobin levels in the body to avoid health problems such as shortness of breath due to insufficient oxygen intake [3].

Hematocrit test is one part of a routine health checkup performed to evaluate a patient's overall health condition.

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Additionally, there are several conditions that require a hematocrit test, such as when experiencing symptoms of anemia. If a patient experiences anemia symptoms like excessive fatigue, shortness of breath, dizziness, paleness, or a rapid heartbeat, the doctor will request a hematocrit test to determine the patient's red blood cell count [4]. If a patient has been diagnosed with certain medical conditions such as anemia, kidney disease, liver disease, or other conditions that can affect hematocrit levels, the doctor will request a periodic hematocrit test to monitor the response to treatment and overall health condition development. A hematocrit test can also be performed before and after certain medical procedures, such as blood transfusions, surgery, or the administration of certain therapies, to monitor changes in red blood cell composition [5].

The main problems for elderly people with hypertension are the low rate of early detection of hypertension in the community, the still low level of adherence to treatment and lifestyle changes, the suboptimal role of primary care services (health centers/elderly community health posts) in routine examinations and counseling, and the high rate of complications such as stroke, heart disease, and kidney failure due to uncontrolled hypertension. The impact of hypertension on the elderly is increased morbidity and mortality in the elderly, decreased quality of life due to complaints such as dizziness, shortness of breath, and fatigue, increased risk of falls due to orthostatic hypotension from irregular medication, and a burden on families and the country in terms of healthcare costs [7]. The purpose of this community service is to improve the health of the elderly through early detection and control of hypertension and anemia by checking blood pressure, hemoglobin levels, and hematocrit.

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Hypertension, or high blood pressure, is one of the non-communicable diseases often referred to as the silent killer because it often doesn't cause symptoms yet can lead to serious complications such as heart disease, stroke, and kidney dysfunction. To prevent these complications, early detection and routine monitoring of body condition are crucial, including simple laboratory tests such as hemoglobin (Hb) and hematocrit (Ht) tests[8].

Hemoglobin and hematocrit tests are used to assess blood condition, particularly in relation to blood viscosity or thickness. In patients with hypertension, increased hemoglobin and hematocrit levels can indicate increased blood viscosity, potentially worsening the heart's workload and increasing the risk of cardiovascular complications such as heart attack and stroke [9]. Conversely, low hemoglobin and hematocrit levels can also indicate anemia, which can worsen oxygen supply to body tissues and cause fatigue and organ dysfunction [10]. By having regular hemoglobin and hematocrit tests, hypertension patients and healthcare professionals can monitor changes in their blood conditions that may occur due to chronic high blood pressure. The results of these tests can be used as a basis for determining more appropriate treatment strategies, both in adjusting the dosage of antihypertensive medication and in improving diet and lifestyle. [11]

Therefore, hemoglobin and hematocrit tests are not just routine laboratory tests but are an important part of early detection and prevention efforts for hypertension complications. Through this early detection, it is hoped that patients can maintain a good quality of life and reduce the risk of long-term complications from hypertension. The purpose of this community service is to improve the health of the elderly through early detection and control of hypertension and anemia by checking blood pressure, hemoglobin levels, and hematocrit.

II. METHOD

The purpose of community service activity is outlined in activity stages to address the health issues of the elderly in Bulak Village, Surabaya City, and is shown in **TABLE 1**.

TABLE 1.
Community Service Implementation Process

Preparation Stage	Implementation Stage	Evaluation Stage
Preparation of educational materials related to hypertension and its impact on the elderly.	Presentation of material related to hypertension by the community service team	Monitoring and evaluation of activities
Preparation of tools and materials for health checks on the elderly in Bulak sub-district, Surabaya	Hemoglobin Test Hematocrit Test Hypertension Test	

The community service team consists of lecturers, education staff, and students from the Surabaya Ministry of Health Polytechnic of Health, and this community service activity was carried out on July 28, 2025, at the Surabaya Ministry of Health Polytechnic of Health. The number of

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respondents in this community service was 49. The target of the community service was the elderly (≥60 years) and health cadres in the working area of Bulak Village, Surabaya City. The strategy to achieve the goal is to carry out early detection and screening of hemoglobin, hematocrit, and blood pressure in elderly community health posts activities.

III. RESULT

The number of respondents in this community service activity is 49 elderly individuals over 60 years of age, as well as health cadres in the working area of Bulak Village, Surabaya. The activities carried out include health education related to non-communicable diseases, particularly hypertension, blood pressure checks, hemoglobin, and hematocrit at elderly posyandu events.

A. EDUCATION ABOUT HYPERTENSION

The community service team conducted counselling and education on hypertension and anemia, as well as the prevention of these diseases. Afterward, the service providers distributed questionnaires to assess the participants' knowledge level. The results of the questionnaire are presented in **TABLE 2**

TABLE 2.
Results Of the Questionnaire on Respondents' Knowledge of Hypertension and Anemia

Activities	Average Pre Test	Average Post Test	Conclusion
Understanding about hypertension and prevention	65	75	Increase in knowledge
Understanding about anemia and prevention	65	76	Increase in knowledge

Based on the results shown in **TABLE 2**, there is an observed increase in the average score between the pre-test and post-test results for both activities conducted. In the aspect of understanding hypertension and its prevention, the average score of the participants increased from 65 on the pre-test to 75 on the post-test. This indicates an increase of 10 points, which can be interpreted as the health education or intervention provided successfully increasing the participants' knowledge about hypertension and how to prevent it.

Figure 1. Health education

Figure 2 Health education

In an effort to raise public awareness and knowledge regarding elderly health, particularly concerning hypertension, socialization and educational activities about hypertension and its impact on the elderly have been conducted in Bulak Village, Surabaya. This activity aims to provide the public, especially the elderly and their families, with an understanding of the dangers of hypertension, risk factors, symptoms, and prevention and control measures. In addition to counseling, this activity also included health checks for the elderly, including blood pressure measurement and hemoglobin and hematocrit level testing. This examination aims to detect the possible presence of hypertension or other comorbidities early on so that appropriate treatment or lifestyle changes can be implemented immediately. Through this activity, it is hoped that the elderly can become more aware of their health and are able to apply a healthy lifestyle in their daily lives. Not only that, but families and the surrounding environment are also expected to be more supportive and attentive to the health conditions of the elderly [12].

B. HYPERTENSION EXAMINATION

Figure 3. Examination process

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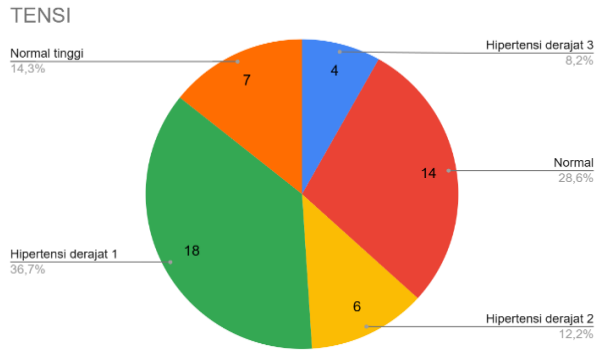

Figure 4. Blood pressure examination results for the elderly

Based on **FIGURE 4**, the results of blood pressure examinations in the elderly in the Bulak sub-district area of Surabaya city show that 18 respondents (36.7%) have grade 1 hypertension, 6 respondents (12.2%) have grade 2 hypertension, and 4 respondents (8.2%) have grade 3 hypertension. Based on the Minister of Health Regulation number hk.01.07/menkes/4634/2021, blood pressure can be classified as optimal, normal, prehypertension, or hypertension grade 1-3, with the following categories

Table 3. Hypertension Grade

Classification	Systolic blood pressure (mmHg)		Diastolic Blood Pressure (mmHg)
Optimal	< 120	and	<80
Normal	120-129	and/or	80-84
Normal high	130-139	and/or	85-89
Hypertension Grade 1	140-159	and/or	90-99
Hypertension Grade 2	160-179	and/or	100-109
Hypertension Grade 3	≥180	and/or	≥110
Solated systolic hypertension	≥140	and	

Source: Minister of Health Regulation number hk.01.07/menkes/4634/2021

Based on the examination results presented in **FIGURE 4** and the hypertension classification shown in Table 3, the majority of elderly individuals fall into the category of Grade 1 hypertension, indicating a mild to moderate increase in blood pressure. This condition needs attention because if left uncontrolled, it can develop into more severe hypertension (grade 2 or 3), which carries a risk of serious complications such as coronary heart disease, stroke, and kidney failure. The high proportion of hypertension among the elderly in this region can be attributed to various factors, such as a diet high in salt and fat, lack of physical activity, stress, a family history of hypertension, and the aging process, which reduces blood vessel elasticity [13] . Comprehensive efforts to prevent and control hypertension in the elderly need to be implemented, including routine blood pressure checks, education on healthy lifestyles, increased fruit and vegetable consumption, and limiting salt intake. Additionally, the role of elderly health posts and healthcare workers is crucial in monitoring health conditions and providing early intervention for high-risk elderly individuals [14][15].

Hypertension is a condition where systolic blood pressure rises above 140 mmHg and/or diastolic blood pressure rises above 90 mmHg. The elderly (60 years and older) are the group most at risk due to physiological changes in the cardiovascular system, decreased blood vessel elasticity, and a high prevalence of comorbidities [14]. High blood pressure in the elderly significantly contributes to the incidence of heart disease, stroke, and kidney failure. Based on the 2013 Basic Health Research (Basic Health Research), hypertension rates increase with age, with a prevalence in the elderly exceeding 60%. Most elderly individuals are unaware that they have hypertension because the disease often does not cause symptoms (a silent disease). Many elderly individuals discontinue therapy due to side effects, financial constraints, or a lack of understanding [16]

C. HEMATOCRIT EXAMINATION IN THE ELDERLY

Figure 5. Hematocrit examination

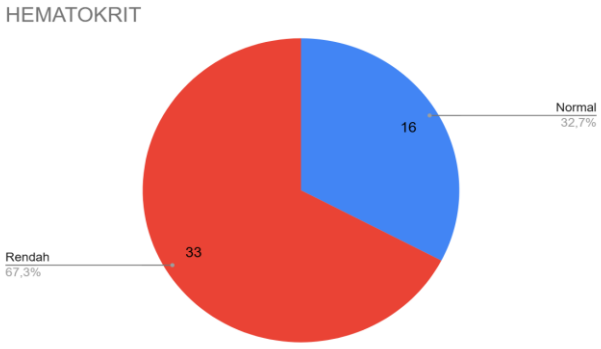

Figure 6. Hematocrit examination results

The examination results in figure 6 show that 33 respondents (67.3%) have low hematocrit levels. This

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finding indicates a fairly high tendency toward anemia or a decrease in red blood cell count among the examined respondent group. Hematocrit is one of the important parameters in the medical world used to measure the percentage of red blood cell volume relative to a person's total blood volume [16].

The main components of blood are red blood cells (erythrocytes), white blood cells (leukocytes), and platelets (thrombocytes). Among the three, red blood cells play a vital role in transporting oxygen and nutrients throughout the body, making normal hematocrit levels essential for proper physiological function. Abnormal hematocrit levels, whether too high or too low, can indicate certain health disorders. A low hematocrit level usually indicates anemia, blood loss, iron deficiency, or a bone marrow disorder that inhibits red blood cell production. Conversely, a high hematocrit level can indicate conditions such as dehydration, polycythemia vera, or disorders of the respiratory and cardiovascular systems that lead to increased oxygen demand in the body [17]. Therefore examination, the findings indicating that the majority of respondents have low hematocrit levels require further attention. Additional tests such as a Complete Blood Count (CBC) can help determine the specific cause of the decreased hematocrit levels, allowing for appropriate medical interventions or lifestyle changes to normalize these levels.

In the human body, there are three components of blood cells: red blood cells, white blood cells, and platelets. Hematocrit is the ratio of the number of red blood cells to the total blood volume in a person's body [18]. Red blood cells play a role in carrying oxygen and nutrients throughout the body, so their levels must be within the normal range for various bodily functions to operate normally. Abnormal hematocrit levels can cause various problems in the body, so it is necessary to determine whether a person has normal hematocrit levels through a complete blood count (CBC) [19]. For example, if the hematocrit level is 46%, it means there are. Based on age and gender, normal hematocrit levels are newborns: 55–66%; 1-week-old infants: 47–65%; 1-month-old infants: 37–49%; 3-month-old infants: 30–36%; 1-year-old children: 29–41%; 10-year-old children: 36–40%; adult males: 42–54%; adult females: 38–46%. Each individual has a different normal hematocrit range. A high hematocrit level exceeding the normal range, such as 60% in adult men, indicates a medical condition that needs attention. High hematocrit levels can be caused by the following conditions:

1. Dehydration:

When the body loses excessive fluids, for example through sweat, vomiting, or diarrhea, this can lead to increased hematocrit levels. Dehydration occurs because the composition of blood plasma is reduced, leading to an increased concentration of red blood cells. A similar condition can occur in hypovolemia, which is when body fluid volume decreases due to dehydration or bleeding [16].

2. Polycythemia vera:

This is a blood disorder or disease characterized by excessive production of red blood cells from the bone marrow. Polycythemia vera can lead to blood thickening, increasing the risk of blood clots and other complications [16].

3. Dengue fever:

In dengue fever, plasma components leak into body organs, leading to an increased concentration of red blood cells and a rise in hematocrit [16].

4. Lung or heart disease:

Certain lung or heart conditions, such as heart failure and the formation of scar tissue or thickening of the lungs, can affect the blood's ability to carry oxygen, causing the body to react by producing more red blood cells.

5. A low hematocrit level is commonly experienced by patients with anemia [16].

Red blood cells are responsible for transporting oxygen and nutrients to various locations in the body. To keep the body healthy, our body needs a sufficient proportion of red blood cells as a normal value standard [20]. If the hematocrit level is known to be too high or too low, it means there is a health problem occurring. A low hematocrit level can indicate bone marrow disease, chronic inflammatory disease, nutritional deficiencies such as iron, folate, or vitamin B-12, bleeding in internal organs, hemolytic anemia, kidney failure, leukemia, lymphoma, or sickle cell anemia [21] Meanwhile, a high hematocrit level can indicate congenital heart disease, kidney tumors, dehydration, lung disease, polycythemia vera, dengue fever due to plasma leakage, and pregnancy, which can lower blood urea nitrogen levels due to increased body fluids, resulting in a lower hematocrit level [22]. If people live in high-altitude areas, their hematocrit levels tend to be higher because of the lower oxygen levels, causing the body to produce more red blood cells [23].

D. HEMATOCRIT EXAMINATION IN THE ELDERLY

Figure 7. Hemoglobin Examination

Based on Figure 8. regarding the results of hemoglobin examination in the elderly in Bulak sub-district Surabaya, the results obtained are that 25 respondents (51.0%) of the elderly have low hemoglobin levels (anemia). Hemoglobin is a protein in red blood cells that gives blood its red color.

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Hemoglobin has a structure consisting of four polypeptide chains, each containing heme, an organic compound containing iron. The formation of hemoglobin requires iron and globin compounds (proteins) [22].

In healthy conditions, normal hemoglobin levels are approximately 12-15 grams/dL for adult women and 13-17 grams/dL for adult men. If hemoglobin levels in the body are abnormal (too high or too low), this can indicate an imbalance in the production and breakdown of red blood cells.

Anemia in the elderly often leads to a decline in quality of life, increases the risk of falls and mortality, and is frequently undiagnosed due to subtle symptoms. The main causes of anemia are malnutrition (lack of iron, vitamin B12, and

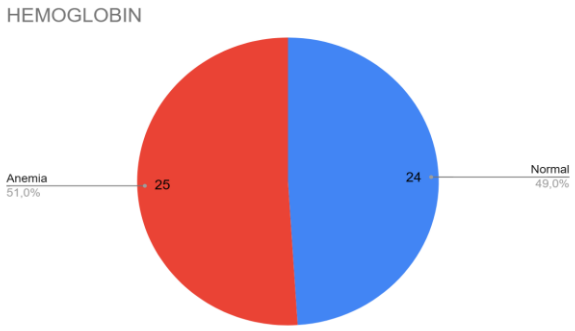

Figure 8. Hemoglobin examination results

folate) and chronic diseases, as well as decreased physiological function of the body and low rates of routine laboratory testing in the community due to limited equipment and cost [21]. Abnormal hemoglobin levels, whether too low or too high, can be affected by changes in diet, activity, medication use, or the menstrual cycle in women [23]. Anemia occurs due to low hemoglobin levels in red blood cells, making it impossible for red blood cells to meet the body's oxygen needs [22]. This condition usually triggers symptoms such as fatigue, weakness, and paleness. Health problems characterized by low hemoglobin levels can be overcome by consuming iron-rich foods, such as green vegetables, grains, apricots, red meat, liver, and raisins. High hemoglobin levels can be caused by several factors, ranging from lifestyle and medication side effects to various health issues, such as dehydration, congenital heart disease, lung diseases like pulmonary fibrosis and chronic obstructive pulmonary disease (COPD), and polycythemia vera (a condition where the bone marrow produces too many red blood cells) [24].

IV. CONCLUSION

The health education and screening activities conducted in Bulak Village, Surabaya, show that the awareness level and health conditions of the elderly, particularly regarding hypertension, hemoglobin, and hematocrit, still require serious attention. Most elderly people experience high blood pressure, with 36.7% falling into the category of grade 1 hypertension and the rest experiencing grade 2 hypertension. A total of 51% of the elderly have anemia or hemoglobin levels below normal. A total of 67.3% of the elderly show low hematocrit levels. This indicates the potential for anemia, nutritional deficiencies, or other chronic illnesses that affect red blood cell production. This condition indicates that continuous education and regular checkups are still needed for the elderly. Support from family and community is also important for increasing awareness of healthy lifestyles, regular health checkups, and consistent treatment to prevent serious complications from hypertension and other blood disorders.

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REFERENCE

[1] Benly N, Mansyarif R, Siti Asma W O, Sartina S, Sitti Fidia Husuni W O, Hastuti AS, et al. Pelayanan pemeriksaan kesehatan gratis pada lansia di wilayah kerja Puskesmas Batalaiworu. J-ABDI J Pengabdian kepada Masyarakat. 2022;1(12):3495–3502. https://doi.org/10.53625/jabdi.v1i12.3449

[2] Ernawati E, Santoso AH, Kurniawan J, Satyanegara WG, Goh D, Syarifah AG, et al. Upaya meningkatkan kesadaran masyarakat terhadap anemia dan pencegahannya pada komunitas lanjut usia. Community Development J. 2023;4(6):12007–12012. https://core.ac.uk/download/pdf/595493873.pdf

[3] Gunawan LS, Widya Martha KT, Puspita RC. Faktor-Faktor yang mempengaruhi kejadian anemia pada lanjut usia. In: Conference on Innovation in Health, Accounting and Management Sciences (CIHAMS); 2022. vol. 2, p. 8–13. https://doi.org/10.31001/cihams.v2i.64

[4] Harningsih T, Widhiyastuti E, Dewi N, Susilowati IT, Harini S. Faktor-faktor yang berhubungan dengan kejadian anemia pada kasus geriatri. J Ilmiah Permas J Ilmiah STIKES Kendal. 2024;14(2):489–496.

[5] Julianti L, Moniaga CS, Gunaidi FC, Herdiman A, Setia N, Firmansyah Y. Korelasi komposisi lemak tubuh, komposisi otot tubuh, kekuatan genggaman tangan, hemoglobin, hematokrit, gula darah, kolesterol, dan asam urat dengan porfirin pada kelompok lanjut usia. J Muara Medika Psikol Klinis. 2024;4(1):17–26. https://doi.org/10.24912/jmmpk.v4i1.34315

[6] Langingi ARC. Hubungan status gizi dengan derajat hipertensi pada lansia di desa Tombolango kecamatan Lolak. Coping Community of Publishing in Nursing. 2021;9(1):46.

[7] Rosyidah DU, Anam ZHF, Maulana I. Pemeriksaan kesehatan, deteksi anemia, dan penanganannya pada peserta posyandu lansia di Kecamatan Gondangrejo Kabupaten Karanganyar. J Pengabdian Masyarakat Medika. 2021:41–48. https://doi.org/10.23917/jpmmedika.v1i2.363

[8] Kementerian Kesehatan Republik Indonesia. Peraturan Menteri Kesehatan Republik Indonesia Nomor HK.01.07/MENKES/4634/2021 tentang Pedoman Nasional Pelayanan Kedokteran Tata Laksana Coronavirus Disease 2019 (COVID-19). Jakarta: Kementerian Kesehatan RI; 2021

[9] Setiawati E. Analisis hasil pemeriksaan anemia dan saturasi oksigen pada lansia panti jompo di Provinsi Sumatera Barat. Scientific Journal. 2023;2(6):256–262. https://doi.org/10.56260/sciena.v2i6.117

[10] Soviah DS. Gambaran nilai hematokrit dan laju endap darah pada lanjut usia (LANSIA) [Tugas Akhir]. Tasikmalaya: Universitas Bakti Tunas Husada; 2022. https://repository.universitas-bth.ac.id/id/eprint/2043

[11] Yusuf MZR. Hubungan kualitas tidur dan pola makan dengan kejadian anemia pada lanjut usia di wilayah kerja Puskesmas Karuwisi Kota Makassar = Sleep Quality and Eating Pattern Associated with Anemia Incidence among the Elderly in the Work Area of the Karuwisi Community Health Center Makassar City [Doctoral dissertation]. Makassar: Universitas Hasanuddin; 2023. http://repository.unhas.ac.id:443/id/eprint/29990

[12] Rumahorbo N, Dalimunthe AR, Fibrini D. Hubungan status gizi dengan hipertensi pada lanjut usia di Puskesmas Rantang Kota Medan. J Kedokteran Kesehatan Mahasiswa Malikussaleh (Galenical). 2020;3(5). https://doi.org/10.29103/jkkmm.v3i5.19555

[13] Sawitri E, Nurmalasari E, Supardi S, Murtana A, Mawardi. Hubungan status nutrisi dengan kejadian hipertensi pada lansia di Kelurahan Kemudo. Prosiding Cohesin. 2023. http://repository.umkla.ac.id/id/eprint/2106

[14] Antara AN, Nugroho AN, Chasanah SU. Hubungan status gizi dengan kejadian hipertensi pada lanjut usia di Desa Girisekar, wilayah kerja Puskesmas Panggang II, Kabupaten Gunungkidul. J Kesehatan Samodra Ilmu (JKSI). 2022;13(1):7–10. https://doi.org/10.32585/jikemb.v4i1.2249.

[15] Wirayudha G, Bakhrul Ilmi IM, Marjan AQ. Analysis of Risk Factors Contributing to Hypertension in Pre-Elderly and Elderly Populations in the Kedaung Subdistrict, Depok, Indonesia. Amerta Nutrition. 2024 Dec 3;8. http://dx.doi.org/10.30872/jkmm.v4i1.7991

[16] Adistira RM, Komala R, Muharramah A. Hubungan status gizi, persen lemak tubuh, RLPP, dan asupan natrium dengan hipertensi pada wanita lansia. Jurnal Gizi. 2022 Dec 1;11(2):60-7. https://doi.org/10.26714/jg.11.2.2022.60-67

[17] Okasari B. Hubungan kualitas tidur dan status gizi dengan kejadian hipertensi pada lansia 60–69 tahun di Desa Batu Belah (UPTD Puskesmas Air Tiris) [Tesis]. [Place unknown]: Universitas Pahlawan Tuanku; 2022. https://repository.universitaspahlawan.ac.id/id/eprint/2401

[18] Ahsana NM, Herdiani N. Hubungan status gizi dengan tingkatan hipertensi pada lansia di Puskesmas Klampis Ngasem, Surabaya. J Kesehatan Masyarakat Mulawarman (JKMM). 2022;4(1). http://dx.doi.org/10.30872/jkmm.v4i1.7991

[19] Yulianti S, Rokhanawati D. Hubungan status gizi dengan kejadian hipertensi pada wanita lanjut usia di Posyandu Wira Lestari 6 Wirobrajan, Yogyakarta tahun 2010 [Tugas Akhir]. Yogyakarta: Universitas 'Aisyiyah Yogyakarta; 2010. http://digilib.unisayogya.ac.id/id/eprint/3476

[20] Kasimovskaya, N., Egorova, E., Shustikova, N., Poleshchuk, I., Khvostunov, K., Malkina, O., & Ermilova, V. (2022). Development of healthcare and social care services for the elderly population. *Journal of comparative effectiveness research*, *11*(17), 1263-1276. https://becarispublishing.com/doi/epdf/10.2217/cer-2022-0133

[21] Hariyana, N., Takarini, N., & Mandasari, V. (2024). Creative Elderly Productive Elderly Flower Arranging activities with the Elderly in Manukan, Tandes District, Surabaya City. *Nusantara Science and Technology Proceedings*, 202-206. https://nstproceeding.com/index.php/nuscientech/article/view/1176?articlesBySimilarityPage=3

[22] Indrayogi, I., Priyono, A., & Asyisya, P. (2022). Peningkatan Kualitas Hidup Lansia Melalui Pemberdayaan Lansia Produktif, Gaya Hidup Sehat Dan Aktif. *Indonesian Community Service and Empowerment Journal (IComSE)*, *3*(1), 185-191. https://ojs.unikom.ac.id/index.php/icomse/article/view/5330/2956

[23] Purusadu, T. K., Alsandi, P., Saputra, R. B., Saguruwjuw, Y., Roju, M. V. T., & Aryono, M. M. (2023). Pemberdayaan Lansia Produktif Dan Sehat Melalui Intervensi Psikologi Positif Kelurahan Taman, Kecamatan Taman, Kota Madiun. *Share: Journal of Service Learning*, *9*(1), 50-57. https://share.petra.ac.id/index.php/share/article/view/25316/20849

[24] Haro, M., Sudharmono, U., Sitompul, M., Malinti, E., & Wulandari, I. S. M. (2024). Edukasi Dan Pemberdayaan Lansia dalam Menjaga Kesehatan di Kelurahan Kacapiring, Kecamatan Batununggal Bandung. *Jurnal Kreativitas Pengabdian Kepada Masyarakat (PKM)*, *7*(3), 1221-1235. https://ejurnalmalahayati.ac.id/index.php/kreativitas/article/view/13372/Download%20Artikel