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Research Article

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Clinical Audit Management of Arterial Hypertenison in the PHC

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Abstract

Arterial hypertension is a major public health concern associated with significant morbidity and mortality. Effective management in Primary Health Care (PHC) is essential to reduce cardiovascular risk and improve patient outcomes. This clinical audit evaluated the management of arterial hypertension at the Main Family Health Center (MFHC) in Gjakova, in accordance with the Ministry of Health–approved National Clinical Protocol. A prospective audit was conducted over a three-month period (August–October 2024), including 367 adult patients diagnosed with arterial hypertension. Data were collected using standardized audit forms and analyzed to assess compliance with predefined structural and process-related quality indicators. Results demonstrated full compliance (100%) with structural criteria, including the availability of clinical protocols and essential medical equipment. However, process indicators showed variable performance. Blood pressure measurement was performed in 97.5% of patients, while body weight and height measurements met or exceeded target levels. In contrast, Body Mass Index (BMI) documentation (55.6%), routine laboratory testing (39.5%), adherence to pharmacological treatment algorithms (35.1%), and referral according to protocol criteria (33.8%) fell below predefined targets. The audit concludes that while infrastructure and basic clinical assessments are satisfactory, improvements are needed in protocol adherence, documentation, laboratory investigation practices, and pharmacological management. Targeted training, strengthened supervision, and a planned re-audit are recommended to enhance the quality and standardization of hypertension management in PHC.

Keywords: Arterial Hypertension, Primary Health Care, Clinical Audit, National Clinical Protocol, Quality Improvement, Blood Pressure Management, Pharmacological Treatment.

Acronym

AG	**:**	Audit Group
BMI	**:**	Body Mass Index
BP	**:**	Blood pressure
CP	**:**	Clinical Protocol
FHC	**:**	Family Health Center
HBP	**:**	High Blood pressure
MFHC	**:**	Main Family Health Center
NCP	**:**	National Clinical Protocol
PHC	**:**	Primary Health Care

Introduction

Arterial hypertension represents a major global public health problem, as it is associated with high rates of morbidity and mortality. The majority of individuals with arterial hypertension are asymptomatic and, as a result, remain undiagnosed and untreated, which significantly increases the risk of coronary artery disease, cerebrovascular disease, retinopathy, and nephropathy.

Hypertension is defined as a systolic blood pressure value ≥ 140 mmHg and/or a diastolic blood pressure value ≥ 90 mmHg. Evidence from randomized controlled trials (RCTs) has demonstrated that antihypertensive treatment in patients with these blood pressure levels is beneficial in reducing cardiovascular risk. The same classification is applied across young, middle-aged, and older populations, with specific adaptations for children and adolescents.

Table 1: Definitions and Classification of Office Blood Pressure Values (mmHg)

Category	Systolic		Diastolic
Optimal	<120	and	<80
Normal	120–129	and/or	80–84
High normal	130–139	and/or	85–89
Grade 1 hypertension	140–159	and/or	90–99
Grada 2 hypertension	160–179	and/or	100–109
Grada 3 hypertension	≥180	and/or	≥110
Isolated systolic hypertension	≥140	and	<90
a Blood pressure category is determined by the higher value of either systolic or diastolic pressure. Isolated systolic hypertension should be classified as Grade 1, 2, or 3 based on systolic blood pressure values.			

Appropriate management of arterial hypertension includes lifestyle modification, pharmacological treatment, regular medical follow-up to assess treatment effectiveness, and specialist referral to a cardiologist or internist in cases of treatment resistance or failure.

To support healthcare professionals—particularly family physicians—in decision-making related to hypertension management in Primary Health Care (PHC), national clinical guidelines and subsequently a National Clinical Protocol for the management of arterial hypertension in adults over 18 years of age were developed. This protocol has been distributed to all family physicians in PHC across Kosovo, aiming to ensure accurate diagnosis and effective treatment of hypertension, ultimately improving the quality of healthcare services in PHC.

Therefore, this clinical audit evaluates the quality of medical care provided to patients with arterial hypertension in Primary Health Care and aims to identify current management practices implemented by family physicians at the Main Family Health Center (MFHC) in Gjakova, in accordance with the criteria set out in the Ministry of Health–approved National Clinical Protocol for the management of arterial hypertension [1].

Aim

To improve the quality of healthcare services in Primary Health Care/Family Medicine for patients with arterial hypertension through the implementation of the National Clinical Protocol for the management of arterial hypertension in individuals aged over 18 years.

Additionally, this audit aims to encourage, motivate, and raise awareness among family physicians regarding increased utilization of the Clinical Protocol in hypertension management.

Objectives

- To document the medical care provided to patients with arterial hypertension.
- To evaluate hypertension management practices by family physicians at the Main Family Health Center in accordance with the National Clinical Protocol for arterial hypertension management.

Standard

At least 80% of patients with arterial hypertension should be managed in accordance with the National Clinical Protocol for arterial hypertension.

Quality Indicators (Criteria)

1. The institution has an approved Clinical Protocol for arterial hypertension.
2. The institution is equipped with a blood pressure measuring device (sphygmomanometer).
3. The institution has blood pressure cuffs of all required sizes.
4. The institution has an adult weighing scale.
5. The institution has a stadiometer or height-measuring tape.
6. Blood pressure is measured for the patient.
7. Body height is measured.
8. Body weight is measured.
9. Body Mass Index (BMI) is calculated and recorded.
10. Pulse rate/heart rate is measured.
11. Routine laboratory tests are requested (complete blood count, lipid profile, blood glucose, sodium, uric acid, urea, creatinine, urinalysis).
12. Patients with arterial hypertension are treated according to the pharmacological treatment algorithm defined in the Clinical Protocol.
13. Patients meeting referral criteria are referred for assessment, consultation, or care at higher levels of healthcare, including:

- Malignant hypertension with target organ damage;
- Blood pressure >220/120 mmHg;
- Suspected secondary hypertension or abnormal laboratory findings (hypokalemia, hypernatremia, proteinuria, hematuria, elevated serum creatinine);
- Hypertension at a young age (<20 years, or need for treatment before age 30);
- Resistant hypertension (≥3 antihypertensive medications);
- Life-threatening complications (e.g., transient ischemic attack);
- Hypertension during pregnancy.

Target Performance Level

The target performance levels for this clinical audit were defined as follows:

1. 100% of medical offices are equipped with an approved Clinical Protocol for arterial hypertension.
2. 100% of medical offices are equipped with a blood pressure measuring device.
3. 100% of medical offices are equipped with blood pressure cuffs of all required sizes.
4. 100% of medical offices are equipped with an adult weighing scale.
5. 100% of medical offices are equipped with a stadiometer or height-measuring tape.

6. 100% of patients with arterial hypertension have their blood pressure measured.
7. 80% of patients with arterial hypertension have their body height measured.
8. 80% of patients with arterial hypertension have their body weight measured.
9. 80% of patients with arterial hypertension have their Body Mass Index (BMI) calculated and recorded.
10. 80% of patients with arterial hypertension have their pulse/ heart rate measured.
11. 75% of patients with arterial hypertension are referred for routine laboratory tests (complete blood count, lipid profile, blood glucose, sodium, uric acid, urea, creatinine, urinalysis).
12. 75% of patients with arterial hypertension are treated according to the pharmacological treatment algorithm defined in the Clinical Protocol.
13. 50% of patients with arterial hypertension are referred for assessment, consultation, or care at higher levels of healthcare, in accordance with referral criteria outlined in the Clinical Protocol.

Methodology

In July 2024, an Audit Group (AG) consisting of nine members was established to conduct a clinical audit evaluating the management of patients with arterial hypertension by family physicians in Primary Health Care at the Main Family Health Center (MFHC) in Gjakova. The Audit Group agreed to conduct prospective data collection over a three-month period, covering August, September, and October 2024. The audit population included all patients aged over 18 years who attended medical visits for arterial hypertension and were managed by family physicians during this period [2].

Data Collection Was Carried out Using Pre-Designed Audit Forms

- Data related to the availability of the Clinical Protocol and essential equipment for measuring blood pressure, body weight, and height were collected through direct observation of family medicine offices.
- Data related to the process of arterial hypertension management in accordance with the Clinical Protocol were collected from family medicine offices at the MFHC.

Prior to data collection, family physicians whose offices were included in the audit were informed about the required data and documentation procedures. Data review, collection, processing, and analysis were conducted by the Audit Group during November 2024. Collected data were processed and analyzed using Microsoft Excel and presented in tabular and graphical formats.

Audit Team

The clinical audit was conducted by the following team members:

Dr Yllzim Dyla[1] - Family physicians, Dr Besa Balidemaj[2] - Family physician MoHK, Dr Fehmije Jaka – Zeka3 - Family physician, Dr Shqipe Qarkaxhija4 - Family physician, Dr Mahije Sefa5 - Family physician, Dr Ferderije Markaj6 - Family physician, Dr Ardijana Shtaloja7 - Family physician, Dr Flutur Shehu8 - Family physician, Dr Elsa Dyla9 - MD Gjakova, Kosova

Auditi Findigs/Results

Structural Criteria

Assessment of the availability of clinical protocols for arterial hypertension, blood pressure measuring devices with cuffs of all required sizes, as well as weighing scales and stadiometers, demonstrated full compliance (100%) with all predefined structural criteria across the audited family medicine offices at the Main Family Health Center (MFHC) and affiliated Family Medicine Centers (FHCs)

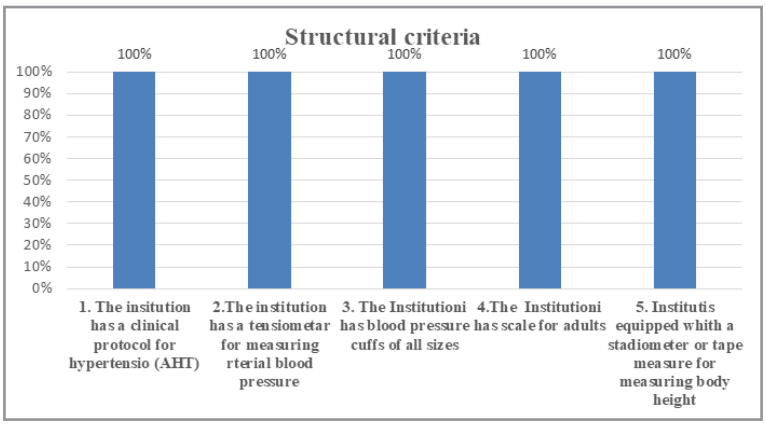

Figure 1: Nr 1 Presentation of findings on the criteria for the structure in the MHFC and FHC

Patient Population

Analysis of audit data revealed that, across 10 family physician offices at the MFHC and FHCs, a total of 367 patients were diagnosed with arterial hypertension during the three-month audit period (August–October 2024).

The distribution of patients by month and by family medicine office is presented in Table 1 and Figure 2.

Table 2: Patient with HBP visited in the MFHC and FHC's by months

Month	Clinic 1	Clinic 2	Clinic 3	Clinic 4	Clinic 5	Clinic 6	Clinic 7	Clinic 8	Clinic 9	Clinic10	Total
August	10	15	16	7	4	11	2	15	15	15	110
September	22	30	14	7	9	10	10	15	15	14	146
October	11	19	6	19	10	7	5	12	15	7	111
Total	43	64	36	33	23	28	17	42	45	36	367

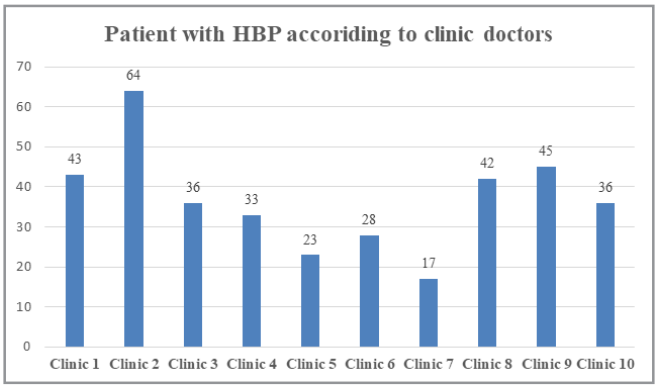

Figure 2: Patients with HBP according to familjy doctor's prescriptions ine MFHC and FHC's

Age and Gender Distribution

Subsequent figures (Figures 3 and 4) present the distribution of patients with arterial hypertension by age group and gender. The highest proportion of visits was observed among patients aged 71–80 years (30.3%), whereas the lowest proportion was recorded among patients aged 21–30 years (1%).

With respect to gender distribution, approximately 60% of patients with arterial hypertension were female, while 40% were male.

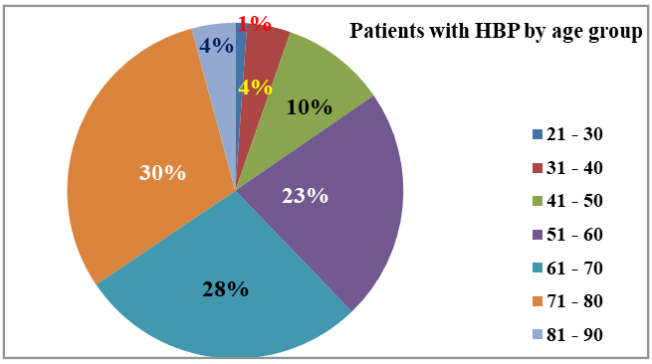

Figure 3: Patient's wtith HBP by age group visited by family physicians s in MFHC and HFC's

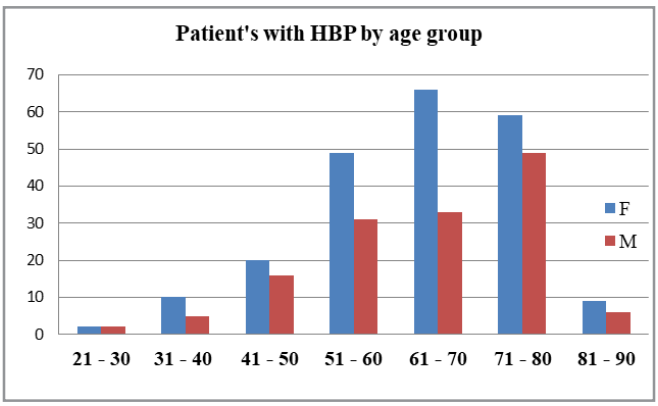

Figure 4: Patient's with HBP by age group and gender visited by family physicians s ine MFHC and HFC's

Blood Pressure Measurement

Blood pressure was measured in 97.5% of visits for patients with arterial hypertension across all audited family medicine offices. These findings are illustrated in Figure 5. Although compliance was high, the predefined target performance level of 100% was not fully achieved.

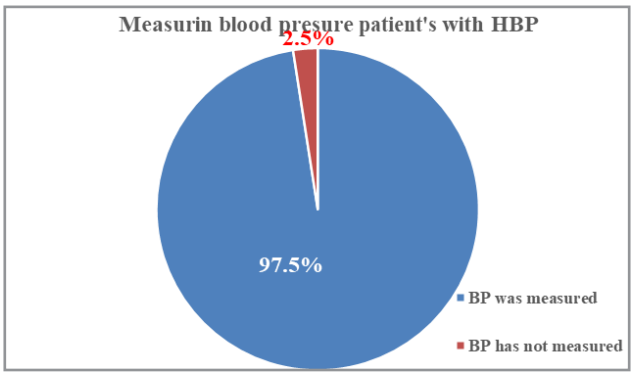

Figure 5: Percentage of patients with HBP who had their BP measured during a visit to the family physicians in MFHC and FHC's

Anthropometric Measurements

- Body height was measured in 91.3% of patients with arterial hypertension (Figure 6), exceeding the predefined target of 80%.
- Body weight was measured in 80.1% of patients (Figure 7), meeting the predefined target performance level.

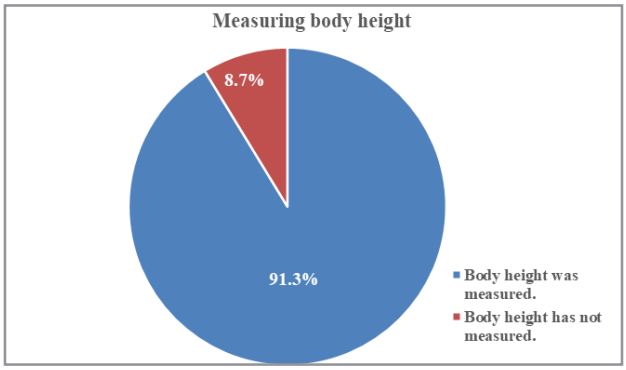

Figure 6: Percentage of patients with HBP who had measured body height during a visit to the family physicians in MFHC and FHC's

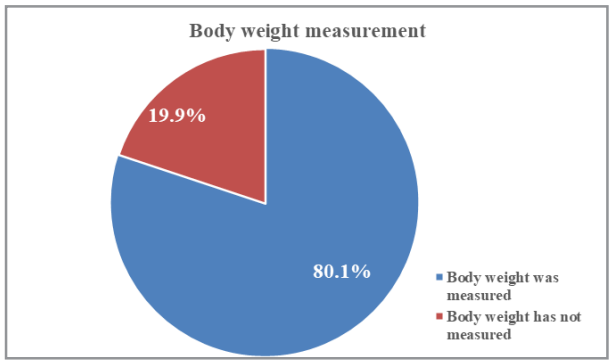

Figure 7: Percentage of patients with HBP who had measured body weight during a visit to the family physicians in MFHC and FHC's

Based on height and weight measurements, calculation of Body Mass Index (BMI) was expected to be performed routinely. However, BMI was calculated and recorded in only 55.6% of patients, as illustrated in Figure 8, which is substantially below the predefined target of 80%.

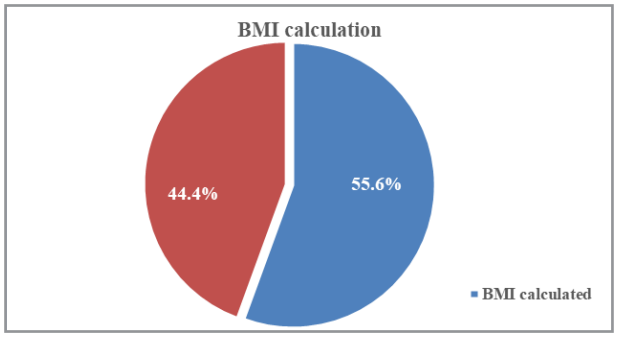

Figure 8: Percentage of BMI determinations of patient's whith HBP during visits to MFHC and FHC's

Body Mass Index Distribution

Among patients whose BMI was calculated:

- 16% had normal BMI values,
- 47% were classified as overweight, and
- 37% were classified as obese (Figure 9).

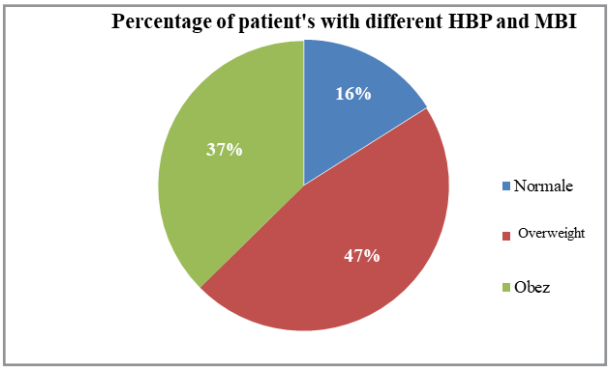

Figure 9: Percentage ratio of patiente's with HBP patiente's with normal BMI, overweight and obese

Gender-based analysis of BMI distribution (Figure 10) demonstrated that:

- Approximately 70% of obese patients were female,
- Over 55% of overweight patients were female, and
- More than 60% of patients with normal BMI were female

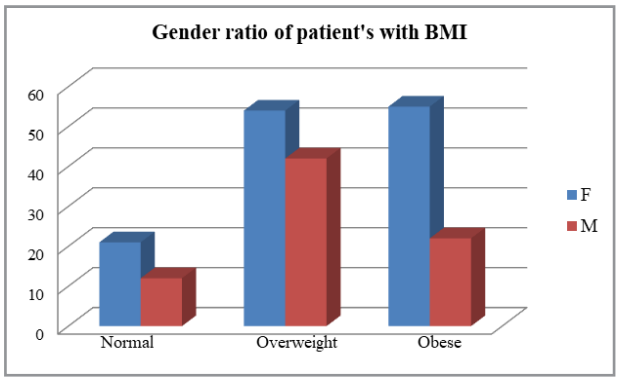

Figure 10: Ratio of patients with HBP with normal BMI, overweight and obese by gender

Pulse/Heart Rate Measurement

Pulse rate or heart rate was measured in 79.6% of patients with arterial hypertension during medical visits (Figure 11). This result fell marginally below the predefined target performance level of 80%.

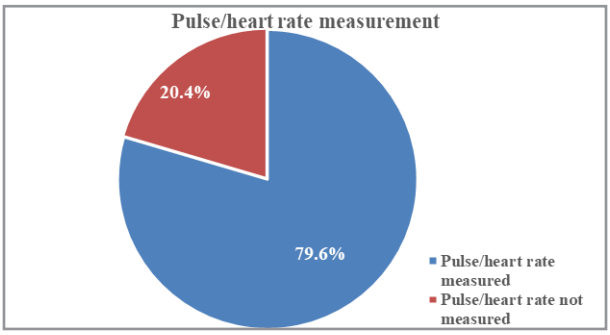

Figure 11: Percentaga of pulse/heart rate measurement of patients with HBP

Laboratory Investigations

Routine laboratory tests, as defined in the Clinical Protocol, were requested in only 39.5% of patients with arterial hypertension (Figure 12). This represents a substantial gap compared to the target performance level of 75%

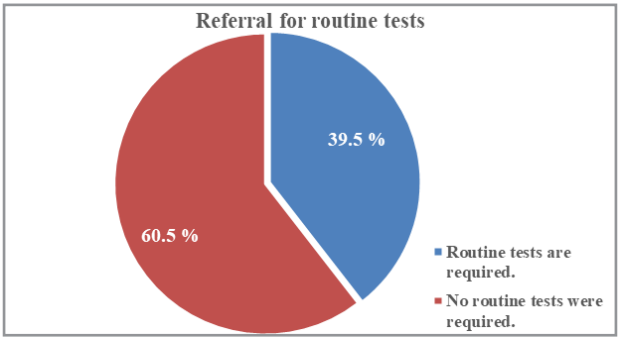

Figure 12: Percentage of routine tests requested by family physicians for the management of patients with HBP

Pharmacological Management

Analysis of pharmacological management demonstrated that only 35.1% of patients with arterial hypertension were treated in accordance with the pharmacological treatment algorithm defined in the National Clinical Protocol (Figure 13).

Conversely, 64.9% of patients did not receive treatment aligned with the protocol-defined algorithm. The target performance level for this criterion was 75%, indicating a significant shortfall in protocol adherence.

Potential contributing factors include ongoing management of patients by secondary or tertiary healthcare providers, in both public and private sectors.

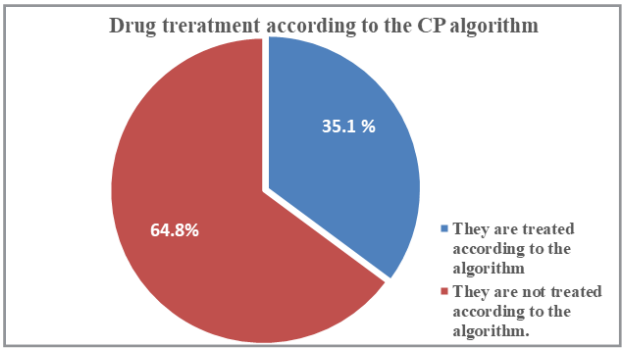

Figure 13: Percentage of patient's with HBP treated according to the algorithm of the national HBP management protcol

Referral Practices

Among patients with arterial hypertension who were referred for further care (n = 77), only 26 patients (33.8%) were referred in accordance with the referral criteria outlined in the Clinical Protocol. The remaining 51 patients (66.2%) were referred without adherence to protocol-defined criteria (Figure 14). The predefined target performance level for appropriate referral was 50%, which was not achieved.

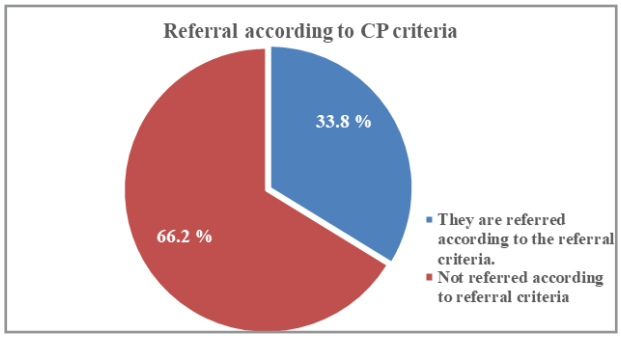

Figure 14: Percentage of patients with HBP referred according to the referral criteria of the national clinical protocol for HBP management

Summary of Process Criteria Compliance

Table 2 and Figure 15 present a summary of compliance with process-related quality indicators among patients with arterial hypertension managed by the 10 audited family physicians at the MFHC and selected FHCs.

Overall, while structural criteria were fully met, compliance with process-related criteria varied significantly, with several key indicators falling below predefined target performance levels

Table 3: Percentage of meeting the criteria of the management process of patients with HBP visitet by 10 family physicians s in MFHC and FHC's

Criterion	Nr.	%	Target level
6. Measurement of BP	358	97.5%	100%

7. Measurement of body height	335	91.3%	80%
8. Measurement of body weight	294	80.1%	80%
9. Calculation and recording of BMI	204	55.6%	80%
10. Pulse/heart rate measurement	292	79.6%	80%
11. Referral for routine tests	145	39.5%	75%
12. Treatment according to the algorithm of CP	129	35.1%	75%
13. Referral according CP criteria	26	33.8%	50%

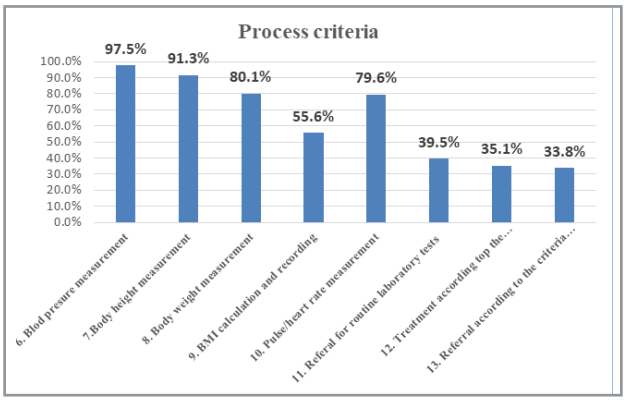

Figure15: Percentage of meeting the criteria of the management process of patients with HBP visitet by 10 family physicians s in MFHC and FHC's

Discussion and Conclusions

This clinical audit assessed the management of patients with arterial hypertension in Primary Health Care at the Main Family Health Center (MFHC) in Gjakova, in accordance with the National Clinical Protocol approved by the Ministry of Health.

Audit findings demonstrated full compliance with all structural criteria, indicating that family medicine offices were adequately equipped with essential infrastructure, medical devices, and approved clinical protocols required for the management of arterial hypertension. However, compliance with process-related criteria varied considerably. While blood pressure measurement, anthropometric assessments, and pulse measurement were largely satisfactory, significant gaps were identified in the calculation and documentation of Body Mass Index (BMI), requesting of routine laboratory investigations, adherence to the pharmacological treatment algorithm, and appropriate referral practices.

The low rate of adherence to protocol-defined pharmacological treatment and referral criteria may be partially attributed to the continuation of treatment initiated at secondary or tertiary levels of care, including private healthcare facilities. Nevertheless, documentation and alignment with the National Clinical Protocol remain essential responsibilities of Primary Health Care providers.

Overall, the audit highlights the need for strengthened implementation of the National Clinical Protocol, particularly with respect to clinical decision-making processes and documentation, to ensure standardized and evidence-based care for patients with arterial hypertension [3].

Recommendations/ Proposed Actions

Based on the audit findings, the following corrective and improvement actions are recommended:

1. Strengthen continuous medical education for family physicians on the National Clinical Protocol for arterial hypertension, with emphasis on pharmacological treatment algorithms and referral criteria.
2. Improve compliance with routine measurement and documentation of Body Mass Index (BMI) for all patients with arterial hypertension.
3. Increase adherence to recommended routine laboratory investigations as outlined in the Clinical Protocol.
4. Reinforce the importance of documenting clinical decisions, particularly when treatment or referral deviates from the protocol.
5. Conduct regular internal monitoring and supervision to support quality improvement in hypertension management.
6. Promote interdisciplinary collaboration between Primary, Secondary, and Tertiary healthcare levels to ensure continuity and standardization of care.

Re-audit

A re-audit is recommended within 6–12 months following the implementation of the proposed corrective actions. The re-audit will assess improvements in compliance with the National Clinical Protocol and evaluate the effectiveness of implemented quality improvement measures.

Executive Summary

This clinical audit evaluated the management of arterial hypertension in Primary Health Care at the Main Family Medicine Center (MFMC) in Gjakova, in accordance with the National Clinical Protocol approved by the Ministry of Health.

The audit was conducted over a three-month period (August–October 2024) using prospective data collection. A total of 367 adult patients diagnosed with arterial hypertension were included. Structural criteria, including availability of clinical protocols and essential medical equipment, demonstrated full compliance (100%).

Process-related indicators showed variable performance. Blood pressure measurement and basic anthropometric assessments were largely satisfactory; however, notable gaps were identified in Body Mass Index documentation, routine laboratory investigations, adherence to pharmacological treatment algorithms, and protocol-based referral practices.

The audit concludes that while infrastructure and basic clinical practices are well established, further efforts are required to strengthen protocol adherence, documentation, and continuity of care. Targeted training, improved supervision, and a scheduled re-audit within 6–12 months are recommended to enhance quality and standardization of hypertension management in Primary Health Care.

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