TRANSDISCIPLINARY APPROACHES TO THE PREVENTION AND TREATMENT OF MEDICATION-RESISTANT HYPERTENSION IN YOUNG PEOPLE (LITERATURE REVIEW)

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ABSTRACT

Background. Medication-resistant arterial hypertension in people aged 10–30 years is clinically important because persistent blood pressure elevation is associated with early target-organ damage and long-term cardiovascular risk.

Aim. To examine current approaches to the prevention and treatment of medication-resistant hypertension in people aged 10–30 years, including non-pharmacological and pharmacological strategies and transdisciplinary models of care.

Materials and Methods. This article presents a narrative review of the scientific literature of the past 10 years retrieved from the PubMed, Scopus and Web of Science databases. Inclusion criteria were English-language peer-reviewed clinical and cohort studies, randomized controlled trials, clinical guidelines, systematic reviews, and directly relevant narrative reviews addressing people aged 10–30 years; adult-only studies without applicability to this age range, conference abstracts without full text, and non-peer-reviewed material were excluded. The study was conducted as a private initiative of the authors, without grant support or state registration of the research topic.

Research Ethics. The review analyzed only published data whose authors declared compliance with ethical standards.

Results. Resistant hypertension was treated as an age-specific phenotype: adult criteria require at least three drugs of different classes, including a diuretic, at maximally tolerated doses with confirmation of uncontrolled values outside the clinic, whereas pediatric criteria are percentile-based. Pseudoresistance caused by non-adherence, the white-coat effect, and measurement error has to be excluded first. Obesity, short sleep, high sodium intake, energy-drink consumption, marked prematurity, and very low birth weight are identifiable contributors, while renal, renovascular and endocrine secondary causes require targeted evaluation. Lifestyle modification and age-adapted pharmacotherapy are supported, but evidence or direct intervention in this age range remains limited.

Conclusions. The aim was achieved: transdisciplinary approaches to the prevention, diagnosis, and treatment of medication-resistant arterial hypertension among people aged 10–30 years were identified and systematized. Diagnostic verification precedes the diagnosis of true resistance; secondary and pseudoresistant forms require targeted evaluation; transdisciplinary care is justified as an organizational framework, although comparative studies are lacking.

Keywords: *cardiology, juvenile hypertension, pediatric blood pressure, renin-angiotensin-aldosterone system.*

Introduction

Hypertension in young people aged 10–30 years is clinically important because blood pressure elevation beginning in adolescence or early adulthood tends to persist over time and is associated with early target-organ changes. Obesity, low physical activity, high sodium intake, sleep disorders, and secondary forms of hypertension are among the factors most consistently discussed in this age range. At the same time, resistant hypertension requires diagnostic caution because apparent resistance can result from inaccurate blood pressure measurement, white-coat effect, suboptimal drug regimens or poor adherence. Hamrahian S.M. & Falkner B. (2022) [1] emphasized the limited evidence base for optimal treatment thresholds and drug strategies in adolescents and adults

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in the younger age range, whereas McEvoy J.W. et al. (2024) [2] provide a structured approach to the confirmation and management of resistant hypertension in adults.

The evidence relevant to people aged 10–30 years is distributed across pediatric hypertension guidelines, studies of early-life and behavioral risk factors, adult resistant hypertension literature and research on secondary causes. This fragmentation complicates the direct translation of care across the transition from pediatric to adult medicine. A transdisciplinary synthesis is therefore useful for distinguishing age-specific diagnostic thresholds from common principles for confirming resistance, excluding secondary causes and combining lifestyle and pharmacological treatment.

Mechanisms that can contribute to persistent or treatment-resistant blood pressure elevation include sodium and volume retention, activation of the renin-angiotensin-aldosterone system, increased sympathetic activity, endothelial dysfunction, and increased arterial stiffness. These mechanisms may coexist and reinforce difficulties in blood pressure control, particularly in chronic kidney disease and metabolic disorders. Their relevance to resistant hypertension is described by Camafort M. et al. (2024) [3], Bourque G. & Hiremath S. (2022) [4], Kulbachuk O.S. et al. (2022) [5], and McEvoy J.W. et al. (2024) [2].

The problem of Medication-Resistant Arterial Hypertension (MRAH) remains a subject of interest among scientists worldwide due to the increasing prevalence of resistant forms across age groups, including young adults. Current research is aimed at clarifying the etiology, improving diagnostic criteria and finding optimal approaches to the treatment of this complex condition.

Resistant hypertension often accompanies various metabolic and cardiovascular comorbidities, which further complicate the achievement of blood pressure control [6]. A similar conclusion was made in the study by Kennedy C. et al. (2022) [7] comparing patients with MRAH and young adults with primary hypertension. Patients with chronic kidney disease and those on peritoneal dialysis occupy a special position. Symonides B. et al. (2025) showed that the proportion of resistant and pseudoresistant hypertension in these groups is very high, which is associated with a reduced sodium excretion, increased vascular stiffness, and activation of the renin-angiotensin-aldosterone system [8]. Etiological understanding of the causes of MRAH is particularly noted in the work of Culha Y. et al. (2024), who point to the multifactorial nature of MRAH, including obesity, endocrine disorders, chronic inflammation, and inadequate adherence to treatment [9].

Considerable attention in the literature is also paid to secondary forms of hypertension. Azizi M. et al. (2024) believe that primary hyperaldosteronism is the main cause of MRAH and often remains undiagnosed [10]. The study by Serrano P.d.L. et al. (2025) emphasizes the need to include acute hepatic porphyria in the list of conditions that should be excluded when diagnosing MRAH or chronic secondary hypertension [11]. In addition, the work of Jónsson K.B. et al. (2023) sheds light on a rare but clinically significant cause of MRAH – pheochromocytoma [12]. Some authors emphasize the need to improve the definitions and diagnostic criteria of MRAH. Camafort M. et al. (2024) believe that the existing definitions do not adequately reflect clinical heterogeneity and do not consistently distinguish resistance from pseudoresistance [3]. Bourque G. & Hiremath S. (2022) note that before diagnosing MRAH, clinicians must verify the accuracy of Blood Pressure (BP) measurements, assess adherence to the therapy, confirm adequate pharmacokinetics of prescribed medications, and exclude the "white coat" effect [4].

The study by Dotsenko N.Y. et al. (2022) indicates that primary care physicians in Ukraine are insufficiently familiar with modern protocols for the diagnosis and management of MRAH, which negatively affects the timeliness and effectiveness of its correction [13]. The pathogenesis of MRAH involves sympathetic nervous system activation, impaired regulation of renal sodium excretion, endothelial dysfunction, and increased arterial stiffness. Culha Y. et al. (2024) note that these mechanisms, although interacting, can function independently and contribute to the maintenance of elevated BP [9]. The role of endothelial dysfunction in the development of MRAH is evidenced by data from the study by Kulbachuk O.S. et al. (2022), who found that the levels of biomarkers of endothelial function in patients with MRAH change with treatment and correlate with the response to therapy [5]. Reviews by Symonides B. et al. (2025) and Milošević M. & Otašević P. (2022) show that successful treatment of MRAH requires not only pharmacological but also non-pharmacological measures, namely lifestyle changes, salt restriction, weight control and treatment of comorbid conditions [8; 14]. A similar conclusion is presented in the work by Hamrahian S.M. & Falkner B.

(2022), who argue that optimal treatment, especially for young patients and people with obesity, requires individualized approaches [1]. Data from Akram M.Z. et al. (2023) confirm that a high body mass index is one of the strongest predictors of drug resistance, and therefore weight loss and body load management are important components of the overall therapeutic regimen [15]. In the context of general recommendations for the treatment of arterial hypertension, van den Born B.J.H. et al. (2026) provide updated target blood pressure levels, propose algorithms for optimizing pharmacotherapy and recommend a combined approach according to the patient's needs [16].

The relevance of this review was determined by the need to integrate age-specific pediatric and adult recommendations with evidence on risk factors, secondary hypertension, and pseudoresistance in people aged 10–30 years.

The synthesis focused on diagnostic confirmation of resistance, modifiable and early-life risk factors, secondary causes, non-pharmacological and pharmacological management, and organizational models requiring cooperation among pediatric, cardiovascular, renal, endocrine, sleep, nutrition, and behavioral specialists.

The **aim** of the work was to identify and systematize transdisciplinary approaches to the prevention and treatment of medication-resistant arterial hypertension in people aged 10–30 years, drawing on current scientific data on the etiology, pathogenesis, and clinical strategies for managing these patients.

Materials and Methods

This work is a narrative review of the literature on current transdisciplinary approaches to the prevention and treatment of MRAH in people aged 10–30 years.

The article presents a narrative review of the scientific literature over the past 10 years from the PubMed, Scopus, and Web of Science databases using the following keywords: *resistant hypertension, medication-resistant hypertension, juvenile hypertension, adolescent hypertension, pediatric blood pressure, renin-angiotensin-aldosterone system, interdisciplinary care, multidisciplinary hypertension, lifestyle intervention, sleep disorders, hypertension, psychological interventions in hypertension*. For the analysis, peer-reviewed articles, clinical and cohort studies, and systematic reviews in English were included; studies of adults without comparative data were excluded. The data were thematically systematized in the following sections: epidemiology, etiology, mechanisms of development, methods of prevention and treatment, clinical outcomes.

The model is integrated in line with the principles of evidence-based medicine and the concepts of P4 Medicine (predictive, preventive, personalized, participatory).

Inclusion criteria were English-language, peer-reviewed, original clinical studies; cohort studies; randomized controlled trials; clinical guidelines; systematic reviews; and directly relevant narrative reviews addressing people aged 10–30 years or providing evidence directly applicable to diagnosis or management in this age range. Exclusion criteria were publications without clinical relevance to hypertension, adult-only studies without applicability to the target age range, conference abstracts without full text, non-peer-reviewed material and duplicate reports. The original narrative search was not prospectively logged by database; consequently, a reliable total number of records initially retrieved cannot be reconstructed without repeating the original search. The revised qualitative synthesis contains 29 cited sources. This limitation is reported explicitly rather than replacing the missing search log with estimated counts.

Research Ethics

The review analyzed only published data whose authors declared compliance with ethical standards.

Results

For this review, resistant hypertension was treated as an age-specific clinical phenotype rather than applying a single blood pressure threshold to all persons aged 10–30 years. In adults, McEvoy J.W. et al. (2024) [2] define resistant hypertension as blood pressure remaining above the treatment goal despite at least three blood pressure-lowering drugs of different classes at maximally tolerated doses, including a diuretic, after exclusion of pseudoresistance; uncontrolled values should be confirmed by home or ambulatory blood pressure monitoring. Their operational definition specifies failure of an appropriate regimen, including a thiazide or thiazide-like diuretic, a renin-angiotensin system blocker, and a calcium channel blocker, to lower office blood pressure below 140/90 mmHg. In adolescents, diagnosis and treatment targets were interpreted according to the American Academy of Pediatrics guideline by Flynn J.T. et al. (2017) [17].

Pseudoresistant hypertension may result from several common causes:

• insufficient adherence to the prescribed antihypertensive regimen;

• a white-coat effect or failure to confirm uncontrolled blood pressure outside the clinic;

• inaccurate blood pressure measurement, inappropriate cuff size, inadequate rest before measurement, suboptimal drug doses, or an insufficient drug combination.

In people aged 10–30 years, these causes should be assessed before resistance is labeled as true. Current adult guidance explicitly exclusdes nonadherence and white-coat uncontrolled hypertension, while pediatric guidance assigns an expanded role to ambulatory blood pressure monitoring [2; 17].

Secondary causes of medication-resistant hypertension in people aged 10–30 years

Secondary hypertension is particularly relevant when blood pressure elevation is early, severe, or difficult to control. The prevalence varies substantially across clinical settings, so a single percentage was not used in this review. Recommended diagnostic priorities include renal parenchymal and renovascular disease, primary aldosteronism, pheochromocytoma/paraganglioma, Cushing syndrome, thyroid disease and coarctation of the aorta [10; 12; 18; 19].

• endocrine disorders, including primary aldosteronism, pheochromocytoma/paraganglioma, Cushing syndrome, and clinically relevant thyroid dysfunction;

• renal parenchymal and renovascular disease, including fibromuscular dysplasia in selected persons with early-onset hypertension;

• obstructive sleep apnea, particularly in the presence of obesity, snoring, or suggestive nocturnal symptoms;

• coarctation of the aorta and other less common secondary causes selected according to clinical presentation.

Drug- and substance-related blood pressure elevation should also be considered. Relevant exposures include:

• non-steroidal anti-inflammatory drugs and glucocorticoids;

• combined oral contraceptives and selected immunosuppressive agents;

• sympathomimetic or stimulant drugs, including medicines used for attention-deficit/hyperactivity disorder when clinically relevant;

• high-caffeine energy drinks and other stimulant-containing products; Oberhoffer F.S. et al. (2022) [20] documented acute increases in blood pressure after energy-drink consumption in a randomized pediatric trial;

• nicotine-containing products and psychoactive substances should be documented in the medication and exposure history because of potential cardiovascular effects.

Early-life factors also require separate consideration. In a nationwide cohort of 513,802 adolescents, Tzvi-Behr S. et al. (2024) [21] found that very and extremely premature birth and very or extremely low birth weight were associated with a less favorable adolescent blood pressure profile, whereas birth weight alone was not independently associated after adjustment. Venkatesh K.K. et al. (2025) [22] further linked maternal hypertensive disorders of pregnancy and gestational diabetes with offspring cardiovascular health in early adolescence. These findings support discussion of prematurity and selected maternal pregnancy factors, while avoiding unsupported numerical estimates for genetic polymorphisms.

Blood pressure monitoring and transdisciplinary assessment

Validated office measurements together with home blood pressure monitoring or ambulatory blood pressure monitoring, are central to distinguishing true resistance from white-coat uncontrolled hypertension and other forms of pseudoresistance [2; 17].

• use validated upper-arm devices and an appropriately sized cuff; cuffless or wearable technologies should not replace validated diagnostic measurements unless they meet accepted validation standards;

• integrate home or ambulatory measurements into follow-up when clinically indicated and feasible;

• coordinate evaluation by pediatric, cardiology, nephrology, endocrinology, and sleep specialists according to age and suspected secondary causes;

• assess nutrition, physical activity, sleep, adherence, psychosocial context and exposure to substances or medicines that may raise blood pressure.

Risk factors and clinical contributors supported by identifiable sources are summarised in *Table 1*. Statistical columns that could not be consistently traced to primary studies were removed, and each row now identifies the source of the statement is based.

Management should distinguish adolescents from adults aged 18–30 years, as diagnostic thresholds and treatment targets differ. Across age groups, lifestyle measures include weight optimi-

Table 1. Risk factors and clinical contributors to hypertension in people aged 10–30 years

Risk factor / contributor	Evidence or association	Clinical relevance	Population / interpretation	Sources
Obesity and overweight	Higher BMI is consistently associated with higher BP in pediatric and younger-age populations; obesity is also frequent in resistant hypertension.	Weight management is a core component of prevention and treatment.	Applicable across the target age range; magnitude varies by cohort.	Hamrahian S.M. & Falkner B. (2022) [1]; Akram M.Z. et al. (2023) [15]; Jiang X. et al. (2025) [23]
Prematurity and very / extremely low birth weight	Very or extreme prematurity and very / extremely low birth weight were associated with a less favorable adolescent BP profile.	Supports documentation of perinatal history.	Nationwide adolescent cohort; birth weight alone was not independently associated after adjustment.	Tzvi-Behr S. et al. (2024) [21]
Maternal hypertensive disorders of pregnancy / gestational diabetes	Maternal cardiometabolic pregnancy complications were associated with offspring cardiovascular health in early adolescence.	Supports assessment of prenatal and family history.	Evidence pertains to offspring in early adolescence and should not be overgeneralized to resistant hypertension.	Venkatesh K.K. et al. (2025) [22]
Short sleep / sleep disturbance	Shorter sleep duration is associated with less favorable BP patterns in youth referred for elevated BP.	Sleep history is relevant to risk assessment and behavioral intervention.	Observational pediatric evidence; does not by itself establish resistant hypertension.	Kogon A.J. et al. (2024) [24]
Obstructive sleep apnea	OSA is a recognized contributor to hypertension and may complicate BP control.	Screen when obesity, snoring, daytime symptoms or resistant hypertension raise suspicion.	Evidence comes from pediatric hypertension guidance and resistant-hypertension literature.	Hamrahian S.M. & Falkner B. (2022) [1]; McEvoy J.W. et al. (2024) [2]
High sodium intake	High sodium intake was associated with hypertensive BP in adolescents and adults in the younger age range with obesity.	Dietary sodium assessment is relevant to lifestyle management.	Association demonstrated in a younger population with obesity.	Ong J. et al. (2024) [25]
Energy drinks / stimulant exposure	Energy-drink consumption can acutely increase BP in children and adolescents.	Exposure history should include caffeine-rich and stimulant-containing products.	Acute randomized pediatric evidence; long-term resistant-hypertension effects remain uncertain.	Oberhoffer F.S. et al. (2022) [20]
Secondary renal, renovascular and endocrine causes	Secondary causes are more likely when hypertension is early, severe or resistant.	Targeted work-up can identify potentially treatable causes.	Particularly relevant to early-onset and resistant disease.	Azizi M. et al. (2024) [10]; Young W.F. (2024) [18]; Munoz-Moreno J.M. et al. (2024) [19]
Pseudoresistance: adherence and measurement problems	Poor adherence, white-coat effect and inaccurate measurement can mimic treatment resistance.	Must be excluded before true resistant hypertension is diagnosed.	Adult definition requires confirmation; pediatric guidance emphasizes ABPM.	Camafort M. et al. (2024) [3]; Bourque G. & Hiremath S. (2022) [4]; McEvoy J.W. et al. (2024) [2]; Flynn J.T. et al. (2017) [17]

Notes: BMI – body mass index; BP – blood pressure; ABPM – ambulatory blood pressure monitoring; OSA – obstructive sleep apnea.

Systematized by the authors based on [1–4; 10; 15; 17–26].

zation, a Dietary Approaches to Stop Hypertension (DASH)-type dietary pattern, reduced sodium intake, and regular physical activity. In pediatric patients, Flynn J.T. et al. (2017) [17] recommend lifestyle counseling and, when pharmacotherapy is indicated, use of an angiotensin-converting enzyme inhibitor, angiotensin receptor blocker, long-acting calcium channel blocker or thiazide diuretic, with treatment titrated to the pediatric target. For adults, McEvoy J.W. et al. (2024) [2] recommend an on-treatment systolic blood pressure target of 120–129 mmHg for most patients if tolerated and use a separate operational threshold to define resistant hypertension.

Drug selection should account for pregnancy potential, kidney disease, secondary causes, and contraindications. Renin-angiotensin system blockers require particular caution in women who are pregnant or planning pregnancy. In confirmed adult resistant hypertension, the regimen should first be assessed for adherence and appropriate dosing, and should include a diuretic, a renin-angiotensin system blocker, and a calcium channel blocker before additional guideline-directed therapy is considered [2]. Evidence specific to resistant hypertension in adolescents and adults aged 18–30 years remains limited; therefore extrapolation from older-adult trials should be explicit.

Table 2 separates pediatric and adult targets and identifies the guideline that supports each recommendation. The previous correlation coefficients, *p* values and generic A/B/C evidence labels were removed because they were not traceable to the cited narrative review.

Discussion

The reviewed evidence indicates that the most robust common principle across the 10–30-year age range is diagnostic verification rather than application of a single numerical threshold. Correct measurement, assessment of adherence, and confirmation outside the clinic are essential before true treatment resistance is diagnosed [2–4; 17]. This distinction is particularly important because the literature combines pediatric percentile-based criteria, adolescent absolute thresholds and adult treatment targets.

Risk-factor evidence is heterogeneous. Obesity is consistently associated with elevated blood pressure in youth and remains clinically relevant to resistant hypertension [1; 15; 23]. Perinatal evidence supports an association of marked prematurity and very low birth weight with adolescent blood pressure but it does not justify assigning an uniform odds ratio to all persons aged 10–30 years [21]. Maternal hypertensive disorders and gestational diabetes may influence offspring cardiovascular phenotype [22]. These findings support inclusion of early-life history in risk assessment without presenting unverified pooled estimates.

Secondary and apparent treatment-resistant hypertension requires focused evaluation. Contemporary reviews and guidelines emphasize primary aldosteronism, renal and renovascular disease, pheochromocytoma/paraganglioma and other endocrine causes in appropriate clinical contexts [2; 10; 12; 18; 19]. The literature does not support a single prevalence estimate applicable to the entire 10–30-year age range; prevalence depends strongly on referral setting and case definition.

Lifestyle modification is biologically and clinically plausible as part of resistant-hypertension care, but direct intervention evidence in people aged 10–30 years is limited. Blumenthal J.A. et al. (2021) [26] reported clinically meaningful reductions in clinic and ambulatory blood pressure with a structured diet-and-exercise program in adults with resistant hypertension; however, the study population was substantially older than the target population of this review. Its results support the treatment concept but should not be interpreted as age-specific proof. Likewise, mechanistic work on carotid-body involvement in resistant hypertension by Paton J.F.R. et al. (2013) [27] is relevant to sympathetic mechanisms but does not establish a youth-specific therapeutic pathway.

Evidence from younger populations is stronger for individual modifiable contributors than for comprehensive multidisciplinary programs. Kogon A.J. et al. (2024) [24] linked sleep duration with blood pressure in youth referred for elevated blood pressure evaluation; Ong J. et al. (2024) [25] reported an association between high sodium intake and hypertensive blood pressure in adolescents and adults in the younger age range with obesity. Oberhoffer F.S. et al. (2022) [20] demonstrated acute blood pressure effects of energy drinks in children and teenagers. These data justify assessment of sleep, diet and stimulant exposure but do not establish that these factors are the dominant causes of resistant hypertension.

Transdisciplinary care is best viewed as an organizational framework for integrating age-specific medical assessment with behavioral and lifestyle management. The reviewed evidence supports involvement of relevant specialists when in-

Table 2. Age-specific recommendations for diagnosis and treatment of hypertension in people aged 10–30 years

Category	Recommendation	Target / criterion	Clinical notes	Sources
Adolescents 13–17 years	Use correct office measurement; assess adherence; confirm uncontrolled BP with ABPM or HBPM when appropriate.	Age-specific thresholds apply.	Exclude white-coat effect, measurement error and suboptimal therapy before labeling true resistance.	Flynn J.T. et al. (2017) [17]; McEvoy J.W. et al. (2024) [2]
	Lifestyle measures first when clinically appropriate; initiate medication for guideline-defined indications.	Treatment goal: SBP and DBP <90th percentile.	BP classification is percentile-based in children <13 years.	Flynn J.T. et al. (2017) [17]
	Lifestyle measures plus pharmacotherapy when indicated by stage, symptoms, target-organ damage or comorbidity.	Treatment goal: SBP and DBP <90th percentile and <130/80 mmHg.	Use pediatric guideline definitions and ABPM where indicated.	Flynn J.T. et al. (2017) [17]
Pharmacotherapy in pediatric patients	Apply adult hypertension guidelines and individualize treatment according to risk and tolerance.	On-treatment target generally 120–129/ 70–79 mmHg if tolerated.	The treatment target is distinct from the operational threshold used to define resistant hypertension.	McEvoy J.W. et al. (2024) [2]
	Weight optimization, DASH-type diet, sodium reduction, regular aerobic/strength activity, adequate sleep and avoidance of stimulant excess.	Support achievement of the age-specific BP target.	High sodium intake and energy drinks have direct evidence in younger populations.	Flynn J.T. et al. (2017) [17]; Ong J. et al. (2024) [25]; Oberhoffer F.S. et al. (2022) [20]
	When indicated, start an appropriate first-line agent and titrate; add a second agent if needed.	Pediatric BP target above.	ACE inhibitor/ARB, long-acting CCB or thiazide is guideline-supported options; comorbidity guides selection.	Flynn J.T. et al. (2017) [17]
Transition to adult care	Optimize a regimen containing a thiazide/thiazide-like diuretic, renin-angiotensin system blocker and CCB at maximum or maximally tolerated doses; then use guideline-directed additional therapy.	Office BP remains ≥140/90 mmHg with uncontrolled status confirmed out of office.	Specialist evaluation should include adherence and secondary-cause assessment.	McEvoy J.W. et al. (2024) [2]; Camafort M. et al. (2024) [3]
	Renal tests, urinalysis and targeted endocrine / renovascular / cardiovascular investigations according to clinical suspicion.	Identify a potentially treatable cause.	Early-onset, severe or resistant hypertension strengthens the indication for targeted evaluation.	Young W.F. (2024) [18]; Munoz-Moreno J.M. et al. (2024) [19]
	Provide diagnosis education, medication counseling, self-monitoring skills and a documented handover plan.	Maintain continuity of BP control and follow-up.	Transition planning should begin before transfer from pediatric services.	Flynn J.T. et al. (2017) [17]

Notes: BP – Blood Pressure; SBP – Systolic Blood Pressure; DBP – Diastolic Blood Pressure; ABPM – Ambulatory Blood Pressure Monitoring; HBPM – Home Blood Pressure Monitoring; DASH – Dietary Approaches to Stop Hypertension; ACE – Angiotensin-Converting Enzyme; ARB – Angiotensin Receptor Blocker; CCB – Calcium Channel Blocker.

Systematized by the authors based on [2; 3; 17; 19; 20; 25].

dicated, but comparative studies of structured transdisciplinary programs in people aged 10–30 years with confirmed resistant hypertension are scarce.

Conclusions

The aim of the work was achieved: current transdisciplinary approaches to the prevention, diagnosis, and treatment of medication-resistant arterial hypertension among people aged 10–30 years were identified and systematized.

Across this age range, the common principle is diagnostic verification rather than a single numerical threshold: correct measurement, assessment of adherence and confirmation of uncontrolled blood pressure outside the clinic precede the diagnosis of true resistance. In contrast, diagnostic thresholds and treatment targets remain age-specific.

Obesity, short sleep, high sodium intake, exposure to stimulant-containing products and marked prematurity or very low birth weight are associated with a less favorable blood pressure profile in this age range and are relevant to risk assessment but the available evidence does not support uniform quantitative estimates across the whole age range. Secondary and pseudoresistant forms require targeted evaluation before treatment is intensified.

Transdisciplinary care is justified as an organizational framework for integrating age-specific medical assessment with behavioral and lifestyle management. However, comparative studies of structured programs in people aged 10–30 years with confirmed resistant hypertension remain lacking.

Prospects for Further Research

Future research should include prospective cohorts that follow adolescents with elevated blood pressure into early adulthood using harmonized definitions of apparent and true resistant hypertension. Randomized controlled trials are needed to test age-adapted lifestyle and pharmacological strategies in patients with confirmed resistance rather than extrapolating from older adult cohorts. Implementation studies should evaluate structured transition from pediatric to adult care, adherence assessment, home and ambulatory monitoring, and multidisciplinary referral pathways. Priority evidence gaps include the age-specific prevalence of true versus pseudoresistant hypertension, the contribution of secondary causes, long-term cardiovascular outcomes, and the effectiveness and cost-effectiveness of coordinated transdisciplinary care.

Authors' Contributions

Contribution / Authors	A	B	C	D	E	F
Kovbasa O.	+		+	+	+	+
Karasova O.		+		+	+	+
Khimich T.			+		+	+
Avdeyeva O.			+	+	+	+

Notes: A – concept; B – design; C – data collection;
D – statistical processing and interpretation of data;
E – writing or critical editing of the article;
F – approval of the final version for publication and agreement to be responsible for all aspects of the work.

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Declarations

Conflict of interest is absent.

All authors have agreed to the publication of the article under the terms of the Creative Commons BY-NC-SA 4.0 license and to the public agreement with Kharkiv National Medical University as the founder and publisher of the journal, and to the processing and publication of their personal data.

The authors of this manuscript declare that, during the conduct of the research, preparation, and editing of this manuscript, they did not use any generative artificial intelligence tools or services to perform any of the tasks listed in the Generative Artificial Intelligence Delegation Taxonomy (GAIDeT, 2025). All stages of the work (from the development of the research concept to the final editing) were carried out exclusively by the authors, without the use of generative artificial intelligence.

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