

UDC 616.1-084:614.44:61-057.1

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To cite this article: Jafarzadeh Sheikh E., Byelousova I. (2025). Vyrishennia problem sertsevo-sudynnykh zakhvoriuvan u systemi pervynnoi medyko-sanitarnoi dopomohy: ohliad profilaktychnykh stratehii, zasnovanykh na dokazovykh danykh [Addressing cardiovascular disease in primary care: a review of evidence-based preventive strategies]. *Fitoterapiia. Chasopys – Phytotherapy. Journal*, 3, 78–87, doi: <https://doi.org/10.32782/2522-9680-2025-3-78>

ADDRESSING CARDIOVASCULAR DISEASE IN PRIMARY CARE: A REVIEW OF EVIDENCE-BASED PREVENTIVE STRATEGIES

Actuality. Cardiovascular diseases (CVD) remain the leading cause of premature mortality and disability worldwide, especially in resource-limited settings where the growing prevalence of modifiable risk factors is not matched by effective outpatient prevention. In this context, the role of primary care as a frontline for early intervention and sustained risk reduction is becoming increasingly critical.

The aim of this study is to provide a comprehensive evaluation of the effectiveness and reproducibility of modern strategies for the prevention of cardiovascular diseases (CVD) within primary care, based on evidence-based data.

Material and methods. This article combines a systematic review of international clinical guidelines and scientific literature from 2019 to 2024, as well as a pilot observational study conducted at an outpatient center in the United States. The study involved 150 patients aged 40–65 years identified as having high cardiovascular risk. Data collection included medical record analysis, structured questionnaires (PAM-13), and evaluation of clinical pathways and care coordination practices. Descriptive statistics and implementation metrics were used to assess adherence to international standards.

Research results revealed a significant gap between clinical indications and the actual implementation of interventions: only 39% of eligible patients received statins, behavioral counseling was provided in 38% of cases, and a high level of self-efficacy (PAM-13 score ≥ 68) was observed in just 23% of participants. The main barriers identified were limited digital infrastructure, poor interdisciplinary coordination, and low patient motivation.

The study underscores the need for a systematically integrated model of CVD prevention in primary care, incorporating digital tools, task redistribution within the healthcare team, and personalized patient support. Study limitations include a selected patient population, a limited follow-up period, and geographic constraints, highlighting areas for future validation and research.

Conclusion. The findings highlight the need for a systematically integrated model of CVD prevention in primary care, incorporating digital tools, task redistribution within the healthcare team, and personalized patient support. Study limitations include a selected patient population, a limited follow-up period, and geographic constraints, highlighting areas for future validation and research.

Key words: cardiovascular disease prevention, primary care, evidence-based medicine, behavioral counseling, digital health technologies, patient adherence, multidisciplinary approach, PAM-13, SCORE2, integrated preventive care.

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Бібліографічний опис статті: Джафарзаде Шейх Е., Білоусова І. (2025). Вирішення проблем серцево-судинних захворювань у системі первинної медико-санітарної допомоги: огляд профілактичних стратегій, заснованих на доказових даних. *Фітотерапія. Часопис*, 3, 78–87, doi: <https://doi.org/10.32782/2522-9680-2025-3-78>

ВИРІШЕННЯ ПРОБЛЕМ СЕРЦЕВО-СУДИННИХ ЗАХВОРЮВАНЬ У СИСТЕМІ ПЕРВИННОЇ МЕДИКО-САНІТАРНОЇ ДОПОМОГИ: ОГЛЯД ПРОФІЛАКТИЧНИХ СТРАТЕГІЙ, ЗАСНОВАНИХ НА ДОКАЗОВИХ ДАНИХ

Актуальність. Серцево-судинні захворювання (ССЗ) залишаються основною причиною передчасної смертності й інвалідності в усьому світі, особливо в умовах обмежених ресурсів, де зростання поширеності модифікованих факторів ризику не супроводжується ефективною амбулаторною профілактикою. У цьому контексті роль системи первинної медико-санітарної допомоги (ПМСД) як передової для раннього втручання та сталого зниження ризику стає все більш важливою.

Мета дослідження – комплексне оцінювання ефективності та відтворюваності сучасних стратегій профілактики серцево-судинних захворювань (ССЗ) у системі первинної медико-санітарної допомоги, на основі доказових даних.

Матеріал і методи. Ця робота включає систематичний огляд міжнародних клінічних рекомендацій і наукової літератури за 2019–2024 роки, а також пілотне спостережне дослідження в амбулаторному центрі США. У дослідженні взяли участь 150 пацієнтів віком 40–65 років, у яких визначили високий серцево-судинний ризик. Збір даних включав аналіз медичних записів, структуровані анкети (PAM-13) й оцінювання клінічних шляхів і практики координації медичної допомоги. Для оцінювання дотримання міжнародних стандартів використовувалися описова статистика та показники впровадження.

Результати дослідження. Виявлено розрив між клінічними показаннями та фактичною реалізацією втручань: лише 39% пацієнтів із показаннями отримували статини, поведінкове консультування проводилось у 38% випадків, високий рівень само-ефективності (PAM-13 ≥ 68 балів) продемонстрували лише 23% пацієнтів. Основними бар'єрами були: обмежена цифрова інфраструктура, слабка міждисциплінарна координація та низький рівень мотивації пацієнтів.

Висновок. Результати дослідження наголошують на необхідності переходу до системно інтегрованої моделі профілактики в первинній медико-санітарній допомозі, що включає цифрові інструменти, перерозподіл завдань усередині команди та персоналізований супровід пацієнтів. Обмеження дослідження пов'язані з вибірковою популяцією, обмеженням терміном спостереження та географічним охопленням, що визначає напрями для подальшої валідації результатів.

Ключові слова: профілактика серцево-судинних захворювань, первинна медико-санітарна допомога, доказова медицина, поведінкове консультування, цифрові технології в системі охорони здоров'я, прихильність до лікування, міждисциплінарний підхід, PAM-13, SCORE2, системне впровадження профілактики.

Introduction. Actuality. Cardiovascular diseases have consistently ranked among the leading causes of mortality and disability worldwide over the past several decades. Despite advances in modern medicine, including the development of pharmacotherapy, diagnostics, and high-tech interventions, the burden of CVD continues to grow, particularly in resource-limited countries, where the rising prevalence of risk factors is not offset by effective outpatient care.

The epidemiological transition to the dominance of chronic non-communicable diseases has revealed significant limitations of primary care, primarily in the areas of early detection, systemic monitoring, and the formation of commitment to preventive care. In the context of such challenges, it is primary care that is becoming the key tool for slowing the progression of pathophysiological processes, capable of influencing modifiable risk factors through screening, behavioral interventions and the organization of continuous monitoring.

Despite the existence of international guidelines and initiatives for standardization of preventive care (ESC, 2021; Arnett et al., 2019; WHO, 2018), there is a noticeable gap between universal strategies and real clinical practice. This is due to differences in the level of resource availability, human resources, digital maturity of systems, and organizational structure of primary care in different countries. The issue of interpretation and adaptation of international preventive care models to regional social and cultural contexts is becoming especially relevant.

In light of the global goal of reducing premature mortality from non-communicable diseases by one third by 2030, stated within the framework of the UN Sustainable Development Goals (WHO, 2016), there is an increasing need for a critical analysis of existing evidence-based approaches to the prevention of CVDs from the standpoint of their reproducibility, effectiveness, and applicability in resource-limited settings.

The aim of the study is to conduct a comprehensive analysis of modern models of CVD prevention at the primary care level, with an emphasis on their scientific validity, interdisciplinarity, and adaptive potential.

The hypothesis put forward is that the systemic integration of multi-level, evidence-based preventive care models into primary care practice contributes to a statistically significant reduction in cardiovascular risk in the population.

The scientific novelty of the work lies in the comparison of the normative bases of international strategies with the results of their implementation in regional healthcare systems. Special attention is given to the integration of digital tools, behavioral technologies, and team models of management into the daily practice of primary care. It allows identifying both effective elements that are consistently reproduced in different conditions and critical areas that require adaptation and refinement.

Materials and research methods. This study is based on a comprehensive methodology that combines a systematic review of scientific literature with a pilot empirical observation in a clinical practice setting. The theoretical component included an analysis of publications from 2019 to 2024 from international databases (PubMed, Scopus, Cochrane Library, ESC, AHA), focusing on clinical guidelines, systematic reviews, and randomized trials that met GRADE A – B criteria. Content analysis of international protocols (ESC Guidelines 2021, AHA 2019–2022) and national strategies (Canada, Israel, Finland, USA) enabled the comparison of feasibility, digital integration, and scale of CVD prevention programs in the primary care system.

The empirical part was carried out in 2024 at the St. Aurelia Primary Care Center (USA), which encompassed 150 patients aged 40–65 years who underwent medical screening as part of a national program. The methods included questionnaires (assessment of knowl-

edge, motivation, behavioral readiness), medical records analysis, and observation of patient care pathways. Particular attention was given to the use of the PAM-13 Self-Efficacy questionnaire (Mosen et al., 2021), as well as to comparing the practical implementation of preventive strategies with international standards set by the ESC and AHA. Statistical analysis was performed using SPSS v27.0.

Literature review

Amid the growing global epidemiological burden of chronic noncommunicable diseases, a top priority for healthcare systems remains the development and implementation the development and implementation of effective strategies for the prevention of cardiovascular diseases (CVD) at the primary care level. Between 2020 and 2025, a strong consensus has emerged in international practice in favor of an integrated approach that involves not only clinical intervention, but also structural reforms in the organization of health services, digital transformation, and an emphasis on behavioral medicine.

One of the most large-scale and structured examples of modern preventive policy is the HEARTS in the Americas initiative, implemented under the auspices of the World Health Organization and the Pan American Health Organization (PAHO) (WHO, 2018). As of 2025, the program encompasses more than 6 000 primary care facilities in 33 countries and reaches approximately 39 million people. Its architecture is built on a modular framework, with each component aimed at eliminating core risk factors and optimizing the patient’s clinical route (fig. 1).

The six functional components of the program encompass lifestyle modification counseling, access to medica-

tions, protocol standardization, digital risk stratification, monitoring, and the organization of multidisciplinary team-based care (WHO, 2018). Each module is assigned a level of evidence in accordance with the GRADE classification, which allows for an assessment of the scientific validity and reproducibility of interventions (table 1).

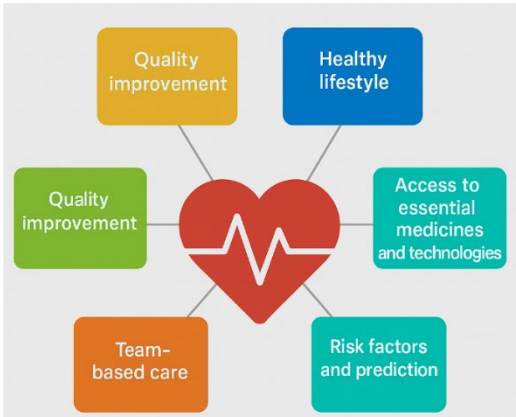


Fig. 1. Structure and modules of the HEARTS initiative (based on materials from PAHO, 2023)

Source: Compendium of Essential Clinical Tools. Washington, DC: PAHO; 2023

The structure of HEARTS enables the gradual adaptation of components into national systems, as evidenced by successful implementations in countries across various income levels. Especially significant is the integration of digital solutions: risk calculators, WHO CVD Risk App, Guidelines-on-the-Go (AHA), and remote monitoring systems allow for personalized monitoring of patients’ condition (fig. 2) (ESC, 2021; Arnett et al., 2019; WHO, 2018).

Table 1

Main modules of the HEARTS initiative

Module	Content	Level of evidence	Normative basis	Digital implementation
Healthy lifestyle	Nutrition, physical activity, smoking cessation.	A	AHA 2019, WHO 2023	Mobile trackers, group sessions
Standardized protocols	Unified algorithms for the treatment of hypertension, coronary heart disease, diabetes.	A	ESC 2021, ACC/AHA 2019	Integration into HER
Access to care	Provision of antihypertensives, glucometers, and blood pressure monitors.	B	WHO HEARTS, national guidelines	Partially automated
Risk stratification	Use of SCORE2, ASCVD Risk Estimator for CVD risk prediction.	A	ESC 2021, ACC/AHA 2019	Risk maps, applications
Team-based management	Distribution of functions between doctors, nurses, pharmacists.	B	WHO Health Workforce 2021	Limited
Monitoring system	Electronic dashboards, performance indicators, feedback.	B	WHO 2023, PAHO Compendium	KPI panels, BI analytics



Fig. 2. Digital tools in CVD prevention: WHO, ESC, AHA mobile applications

Source: compiled by the author based on materials from WHO, ESC, AHA (2023)

Alternative approaches are also being developed in parallel. In 2022, the American Heart Association (AHA) introduced the Life's Essential 8 model, expanding on the previous Life's Simple 7 concept by including sleep as a separate component of cardiovascular health (Arnett et al., 2019). Each of the eight elements is scored on a scale from 0 to 100, forming an individual CVH index widely used in population studies (fig. 3).



Fig. 3. Components of the Life's Essential 8 model (AHA, 2022)

Source: American Heart Association, 2022

The regulatory foundation for most models is provided by the ESC 2021 guidelines and AHA/ACC 2019 guidelines, which include modern methods of stratification,

counseling, and evidence-based pharmacological preventive care (ESC, 2021; Arnett et al., 2019). The ESC emphasizes the importance of social stratification and risk stratification using SCORE2, and the ACC/AHA emphasizes an individualized approach and multifactorial intervention.

The PREDIMED project, the largest Spanish RCT confirming the effectiveness of the Mediterranean diet in reducing cardiometabolic risks, plays a key role in the evidence base for preventive care (Estruch et al., 2013). Meta-analyses of recent years demonstrate a sustained reduction in systolic blood pressure, body weight, triglycerides, and HbA1c in participants who followed a diet high in olive oil or nuts (table 2).

Among the national cases, Finland's North Karelia project is of particular interest, having achieved a 60% reduction in ischemic heart disease mortality over two decades, and Israel, which has implemented digital registries and risk-based patient routing (Puska et al., 2009). In Canada, automated screening and telemedicine consultation systems are being developed.

As a result, global and domestic experience clearly shows that sustainable CVD prevention programs in primary care are effective if they are based on a structured, evidence-based and digitally supported model. However, their transfer to other socio-cultural contexts requires subtle adaptation, taking into account the resource and organizational features of a particular healthcare system.

Theoretical review

A modern understanding of CVD prevention is impossible without a clear distinction between its levels and the theoretical foundations on which clinical and organizational models of intervention in the primary care system are built (table 3).

One of the key conceptual shifts in recent years has been the strengthening of the role of the biopsychosocial model of medicine, originally proposed by George Engel in 1977 and later reinterpreted within the framework of behavioral, family, and patient-centered medicine. According to this model, health is viewed as the result of the interaction between biological, psychological, and social factors. In the context of primary care, this represents a transition away from the biomedical paradigm

Table 2

Effects of the Mediterranean diet (PREDIMED update)

Group	Δ BMI (kg/m ²)	Δ SBP (mmHg)	Δ Triglycerides (mmol/l)	Δ HbA1c (%)	Compliance (%)	Notes
EVOO	-0,88	-2,3	-0,22	-0,3	88,6	Used ≥ 4 tablespoons of oil daily
Nuts	-0,40	-2,6	-0,25	-0,4	86,3	Daily dose: 30 g almonds, walnuts, hazelnuts

Table 3

Levels of CVD prevention in primary care

Prevention level	Target	Key measures	Example of implementation
Primary	Preventing the development of the disease	Control of blood pressure, weight, nutrition, smoking cessation	Risk factor screening, counseling
Secondary	Detecting the disease at an early stage and preventing progression	Hypertension diagnostics, ECG, SCORE2 calculation	Risk stratification, clinical examination
Tertiary	Prevention of complications, relapses and disability	Pharmacological therapy, rehabilitation, support	Cardiac rehabilitation, therapy monitoring

toward a model in which the patient is perceived as an active participant in the process – with their own values, motivations, and limitations.

It is in this context that the 5A behavioral model (Ask, Advise, Agree, Assist, Arrange) is widely used, having proven effective in the prevention of CVD, especially in patients who smoke, are physically inactive, overweight, or have eating disorders (Meng et al., 2022). The advantage of this model is its cyclical nature and clear structure of interaction throughout the entire follow up period.

In addition to the 5As, an important factor is the Prochaska & DiClemente (1983) model of stages of behavioral change, which identifies sequential stages of behavior change: from intention to action and maintenance. The model helps the clinician more accurately assess the patient’s readiness to change and adapt counseling tactics (fig. 4).

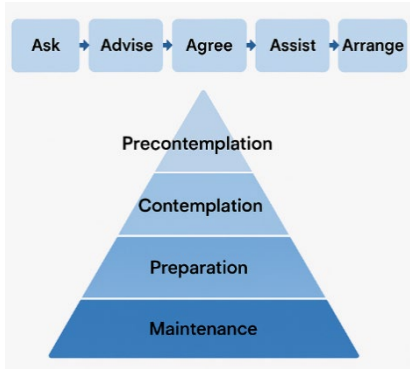


Fig. 4. The 5A Behavioral Model and Stages of Patient Readiness for Behavior Change (AHA, CDC, Prochaska & DiClemente)

Source: compiled by the author based on materials from AHA (2021), CDC (2022), Prochaska & DiClemente (1983)

The modern preventive paradigm is also increasingly integrated with the organizational model of Integrated People-Centered Health Services (WHO, 2016), which prioritizes continuity of care, reducing administrative barriers and expanding the functions of the entire primary care team, including nurses, paramedics, social workers,

and pharmacists. This is especially important in the context of staff shortages common in rural and remote areas, where a physician is not able to single-handedly implement the full scope of preventive services.

The methodological framework of this study is based on the principles of evidence-based medicine (EBM). Clinical decision-making combines scientific evidence, professional experience, and patient preferences. The GRADE system is used for objective assessment of recommendations, allowing classification of the strength of recommendations and the level of evidence (high, moderate, low, very low) based on the quality of the methodology, consistency and applicability of the results.

Theoretical approaches provide a conceptual framework that enables not only the systematization and comparison of data, but also the development of adaptation scenarios taking into account the specific features of primary care in a given region.

Research results and their discussion. This study provided both regulatory-analytical and empirical data, which allowed for a comprehensive assessment of the effectiveness of CVD prevention strategies in primary care. By combining the evidence base of international guidelines with practical observations obtained during a pilot project at the St. Aurelia Primary Care Center (USA), the research not only structured effective preventive care approaches, but also identified real-world barriers to their implementation in clinical practice.

The study population is characterized by a pronounced set of modifiable risk factors, which emphasizes the need for a personalized approach and multi-level preventive care at the primary care level (table 4, fig. 5).

The second stage included an analysis of the actual implementation of clinically based preventive strategies. A comparison of clinical indications with prescribed treatments showed a significant discrepancy between the normative model and real clinical practice.

Of the 89 patients with indications for pharmacotherapy (lipid-lowering or antihypertensive), only 39% received statins, 46% received antihypertensive therapy, and only 21% received combination therapy. Behavio-

Table 4

Clinical and demographic characteristics of patients (n = 150)

Indicator	Average / Category	SD / %	Notes
Age (years)	54,2	±6,8	Range: 40–65
Men	78 people	52	Male predominance
Body Mass Index (BMI)	28.7	±4,2	68% have a BMI >25
Blood pressure (mmHg)	143/88	—	42% had hypertension ≥140/90
LDL cholesterol (mmol/l)	132 mg/dL	±16	51% had levels above 100 mg/dL
Physical activity	<150 min per week	56	According to self-assessment
Active smoking	Yes	21	Noted during the survey
Associated diseases	T2DM, obesity, hypertension	36	According to medical records

Table 5

Implementation of strategies in patients with established indications (n = 89)

Type of intervention	Indications were (% of 150)	Treatment prescribed (% of those in need)	Notes
Statins	59	39	Some patients refused therapy
Antihypertensives	64	46	Insufficient dose titration
Combination therapy (≥2 LS)	41	21	Multifactorial risk is often ignored
Behavioural counselling	100	38	One-time conversation, no follow-up support
Application of risk scales	100	32	Used irregularly, manually

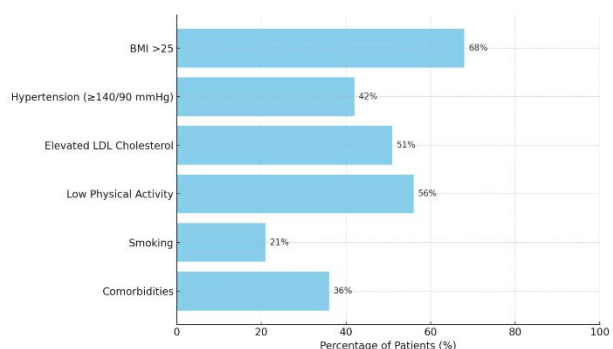


Fig. 5. Distribution of risk factors among patients (diagram)

Source: compiled by the author based on research materials

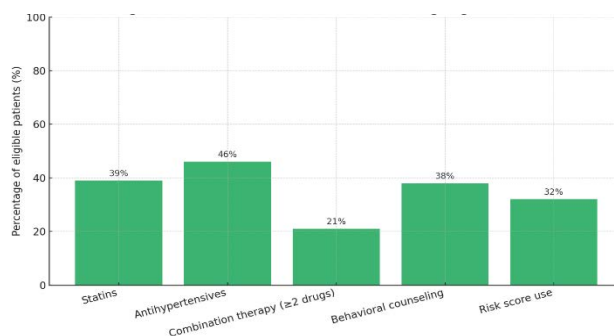


Fig. 6. Rate of interventions in patients in need (histogram)

Source: compiled by the author based on research materials

ral counseling was performed in 38% of cases, but most often as a one-time discussion with no structured follow-up. The use of risk assessment scales (SCORE2, ASCVD Risk Estimator) (ESC, 2021; Arnett et al., 2019), was also limited to non-systemic and predominantly paper-based use (table 5, fig. 6).

Formally existing opportunities are not fully realized: pharmacotherapy and counseling are prescribed without sufficient regularity and with a limited individual approach.

Since the effectiveness of preventive care largely depends on the patient's own behavior, the level of adherence to interventions was assessed using the PAM-13 questionnaire (Mosen et al., 2021). The results showed that 33% of patients had a low activation level (≤47 points), which reflects passive adherence to pre-

scribed treatments or ignoring them. The average level of adherence (48–67) was recorded in 44%, and only 23% demonstrated a high level of self-efficacy (table 6).

More than half of those surveyed do not demonstrate sustainable behavioral participation, which reduces the effectiveness of even formally conducted interventions.

At the next stage of the analysis, a typical patient pathway from screening to follow up care was reconstructed. It was found that only 24,7% of patients attended repeat preventive visits, digital risk calculators were used in 32% of cases, and behavioral questionnaires were predominantly administered in paper form (38% of cases). The participation of nursing and other support medical staff remains fragmented: nurses participated in preventive activities in 19% of cases, pharmacists in 6% (table 7, fig. 7).

Table 6

Distribution of patients by adherence levels (PAM-13)

Adherence level	Points (PAM-13)	Percentage of patients	Interpretation
Low	≤47	33%	Lack of motivation, refusal to interact
Average	48–67	44%	Occasional compliance with recommendations
High	≥68	23%	Active participation and self-control

Table 7

Elements of the patient pathway and their implementation

Interaction stage	Frequency (%)	Note
Repeated counseling	24,7	Lacks systematic implementation
Applications of digital calculators	32	Predominantly without integration into medical records
Use of questionnaires (PAM-13)	38	Paper forms, no feedback
Nurse participation	19	Limited to data collection role
Pharmacist participation	6	Not part of the patient pathway

Table 8

Main barriers to implementation of preventive care in primary care

Category	Specific manifestations
Technological	Lack of digital questionnaires, calculators, EMR – in 68% of offices.
Organizational	No standard pathways, low frequency of follow-up visits.
Workforce-related	Low nurse (19%) and pharmacist (6%) participation, physician overload.
Behavioral	Low adherence (33% with PAM ≤ 47), counseling refusal.

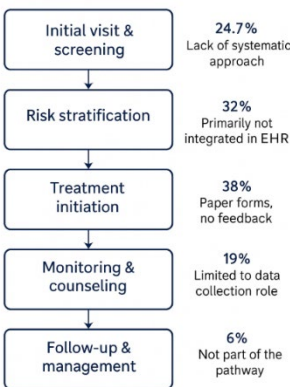


Fig. 7. Patient pathway model for individuals with high CV risk

Source: compiled by the author based on research materials

Incomplete patient routing and weak team coordination significantly reduce the potential of preventive models, even when technical and methodological capabilities are available.

The final stage of the analysis focused on classifying the barriers identified during the observation. These were organized into four main categories: technological, organizational, workforce-related, and behavioral (table 8).

The combined results of the theoretical and empirical analysis demonstrate a significant gap between

the formalized international model of CVD prevention and its implementation in real outpatient practice. The identified limitations – from behavioral passivity to immature digital infrastructure and workforce capacity – emphasize the need for an integrated approach. Effective adaptation of global strategies is impossible without the creation of a structured, digitally supported, and interdisciplinary model that can take into account the characteristics and resources of a given healthcare system.

The results of the study allow us to take a new look at the prevention of cardiovascular diseases (CVD) within the framework of primary care, viewing it as a complex system in which three critically important components intersect: clinical implementation of evidence-based protocols, organizational infrastructure of the outpatient link, and behavioral readiness of the patient for active participation in preventive care. Each of these levels has an independent significance, but only their interrelation ensures the achievement of the targets set out in international recommendations.

Analysis of the clinical and demographic parameters of the sample (see Table 1 in the Research results section) showed that most patients had two or more modifiable risk factors. Notably, 68% of participants were overweight, and 56% exhibited insufficient physical activity. These figures not only reflect an alarming epidemiological trend but are also compa-

Table 9

Barrier matrix for preventive care implementation (based on pilot observational data)

Category	Detailed manifestation	Clinical implications
Organizational	Average appointment duration <12 min; no follow-up.	No risk calculation, simplified counseling.
Technological	68% of offices without integrated EMR, calculators are launched manually.	SCORE2 and ASCVD are not used regularly.
Staff	Nurses do not provide counseling; pharmacists are excluded from the pathway.	Physician is overloaded; there is no task-sharing.
Behavioral	33% of patients with PAM ≤ 47 ; high rate of non-adherence.	Protocol $\neq$ compliance, decreased efficiency.

rable to data from major U.S. cohort studies, such as NHANES and BRFSS, where similar rates of obesity and physical inactivity range from 60–65% and 55–60%, respectively. The high frequency of hypercholesterolemia (51%) also confirms the representativeness of the study population for urbanized regions of the United States.

However, as the data show, the main problem is not the risk factor burden per se, but the significant discrepancy between the presence of indications and the actual implementation of interventions. Despite the fact that the absolute majority of patients met the criteria for the prescription of lipid-lowering and antihypertensive pharmacotherapy, based on SCORE2 scales $\geq 5\%$ and ASCVD $\geq 7.5\%$, in accordance with ESC and AHA guidelines (ESC, 2021; Arnett et al., 2019), statins were prescribed to only 39% of those indicated, antihypertensive agents to 46%, and combination therapy was implemented in just 21% of the cases. This highlights a persistent gap between knowledge of recommendations and their practical implementation.

A similar pattern is observed with non-pharmacological interventions. Despite the universal need for behavioral counseling, confirmed by all international guidelines, the 5A model (Meng et al., 2022) was used in only 38% of cases, and follow-up sessions of motivational interviewing were documented in less than a quarter of patients. In this context, the level of commitment to preventive care, measured by the PAM-13 questionnaire (Mosen et al., 2021), becomes especially important. According to the data obtained, 33% of patients demonstrated low involvement (≤ 47 points), which correlates with poor adherence to therapy and irregular physician visits (table 9, fig. 8).

The findings are consistent with the results of primary prevention quality assessment studies conducted in the United States, which also note that only one-third of high-risk patients achieve LDL target levels despite clear clinical prescriptions and recommendations. Thus, the main obstacle is not a lack of clinical information, but a gap between knowledge and action, on the part of both the physician and the patient.

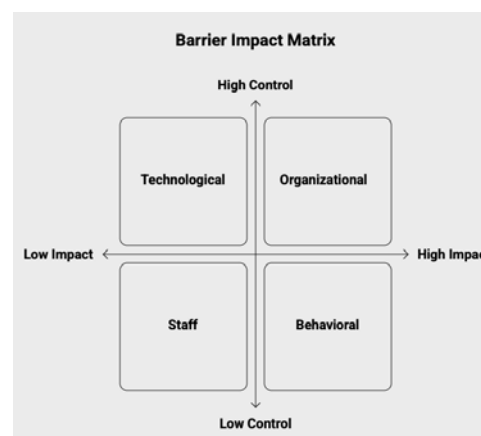


Fig. 8. Barrier impact matrix: axes represent degree of control and scale of impact

Source: compiled by the author based on research materials

The presented results also shed light on the potential for systemic transformation of preventive care. First, integrating electronic medical records with automatic SCORE2 and ASCVD (ESC, 2021; Arnett et al., 2019) calculation would eliminate the main “first-step error” – the lack of risk stratification. In U.S. healthcare facilities where such systems have already been implemented, the level of compliance with lipid recommendations reaches 90% or higher, according to reports from registries such as PINNACLE or Million Hearts®.

Secondly, task-sharing among team members allows to extend the time and functional scope of the visit without increasing the workload of the physician. Data from a meta-analysis of 34 randomized studies demonstrate that patient management models involving nurses lead to a 7–9% increase in the proportion of patients achieving target blood pressure values compared to traditional approaches.

Thirdly, digital patient support via mobile applications, push notifications, and coaching enhances the motivational effect. Thus, the American mHealth-Cardio study showed a twofold increase in the proportion of patients continuing therapy after one year when dig-

ital support was used. In this context, it is advisable to integrate the PAM-13 questionnaire (Mosen et al., 2021) into the structure of the mobile application, which will allow real-time monitoring of motivation dynamics and adapting interventions to individual needs.

However, interpretation of the results requires acknowledgment of several limitations. First, the observation was conducted in one urban outpatient center and did not cover the rural population. Second, the sample size ($n = 150$) is insufficient to construct robust multi-variable models. Third, the observation period was limited to 12 months, precluding analysis of long-term outcomes (heart attacks, strokes). These aspects limit the generalizability of the findings and highlight the need for validation in larger populations.

In light of the above, the presented study confirms that a qualitative breakthrough in CVD prevention is possible only when clinical protocol, organizational environments, and patient behavioral readiness are synchronized. Each of these components is not just background support, but functionally equal. Therefore, new preventive care programs should not be built as linear clinical pathways, but as integrative platforms in which digital logistics, team-based care, and personalized counseling form a closed loop of sustainable cardiovascular risk management.

Conclusions. Cardiovascular disease (CVD) prevention remains a key area in reducing the global burden of premature mortality and disability. In resource-lim-

ited settings, primary care has the greatest potential for early intervention and sustained risk factor control.

The results of this study confirmed the effectiveness of comprehensive strategies combining screening, behavioral counseling, pharmacotherapy, and digital tools in U.S. outpatient settings. At the same time, systemic and behavioral barriers were identified that limit the implementation of these strategies in a real-world clinical practice, ranging from insufficient integration of digital solutions to low patient motivation.

The further development of CVD prevention at the primary care level requires institutional support: formal regulation of preventive services, workforce training for interdisciplinary collaboration, and large-scale integration of digital tools into standard outpatient workflows. Regional adaptations of clinical guidelines and the use of personalized approaches focusing on patient motivation and adherence are of particular importance.

The limitations of this study include a single-center observational design, limited sample size, and a 12-month observation period. The lack of follow-up on clinical outcomes such as myocardial infarction and stroke precludes assessing the long-term effectiveness of the interventions. These limitations provide directions for future research aimed at expanding the study geography, scaling the model, and building sustainable, digitally supported CVD prevention systems in the US healthcare system.

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Стаття надійшла до редакції 30.04.2025

Стаття прийнята до друку 08.08.2025

Опубліковано: 15.10.2025

Conflict of interest: none.

Contribution of the authors:

Jafarzadeh Sheikh E. – concept and design of the work, data collection and analysis, article writing, article revision;

Byelousova I.V. – article writing, article revision.

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