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Kramarchuk Volodymyr Viktorovych PhD in Medicine, Assistant Professor, Department of Family Medicine, Propaedeutics of Internal Medicine and Laboratory Diagnostics, Dnipro State Medical University, Dnipro, https://orcid.org/0000-0002-4224-6493

Yashkina Tetiana Olehivna PhD in Medicine, Assistant Professor, Department of Family Medicine, Propaedeutics of Internal Medicine and Laboratory Diagnostics, Dnipro State Medical University, Dnipro, https://orcid.org/0000-0002-1747-4849

STRUCTURED PATIENT EDUCATION FOR NON-COMMUNICABLE DISEASES IN PRIMARY CARE

Abstract. Non-communicable diseases (NCDs) are the leading cause of mortality worldwide, with outcomes largely determined not only by pharmacotherapy but also by patients' day-to-day behaviours outside the clinical encounter. This underscores the importance of structured patient education and self-management support as core components of chronic disease management in primary care.

The aim of this study was to synthesise international experience in structured patient education programmes ("health schools"), to examine their theoretical foundations, clinical and economic effectiveness, and to identify practical approaches for implementation in Ukrainian primary care. A narrative review with elements of targeted evidence synthesis was conducted, including international clinical guidelines, systematic reviews, meta-analyses, and key randomised controlled trials.

The findings indicate that structured education improves behavioural outcomes, self-efficacy, and adherence, and is associated with clinically meaningful effects across major NCDs, including type 2 diabetes mellitus, hypertension, chronic obstructive pulmonary disease, and heart failure. These programmes demonstrate reductions in hospitalisations and favourable cost-effectiveness profiles. At the same time, evidence shows that one-off educational interventions are insufficient, and sustained benefits require ongoing support, follow-up, and integration into routine care pathways.

In Ukraine, primary care reform has established an organisational foundation, including wide population coverage and eHealth infrastructure. However, implementation remains constrained by the absence of standardised curricula, dedicated financing mechanisms, and a trained facilitation workforce. Additional challenges arise from the wartime context and the needs of vulnerable populations.

A stepwise implementation approach, beginning with pilot standardised programmes for hypertension and type 2 diabetes and followed by system-level scale-up, represents a feasible and evidence-based strategy for integrating structured patient education into primary care.

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Keywords: non-communicable diseases; primary care; structured patient education; therapeutic patient education; self-management; COM-B; Health Belief Model; self-efficacy; DESMOND; Ukraine.

Крамарчук Володимир Вікторович доктор філософії в області медицини, асистент кафедри сімейної медицини, пропедевтики внутрішньої медицини та лабораторної діагностики, Дніпровський державний медичний університет, м. Дніпро, https://orcid.org/0000-0002-4224-6493

Яшкіна Тетяна Олегівна доктор філософії в області медицини, асистент кафедри сімейної медицини, пропедевтики внутрішньої медицини та лабораторної діагностики, Дніпровський державний медичний університет, м. Дніпро, https://orcid.org/0000-0002-1747-4849

ШКОЛИ ЗДОРОВ'Я ДЛЯ ПАЦІЄНТІВ ІЗ НЕІНФЕКЦІЙНИМИ ЗАХВОРЮВАННЯМИ НА РІВНІ ПЕРВИННОЇ МЕДИЧНОЇ ДОПОМОГИ

Анотація. Неінфекційні захворювання (НІЗ) залишаються провідною причиною смертності у світі, причому результати їх лікування значною мірою залежать не лише від призначеної фармакотерапії, а й від щоденної поведінки пацієнтів поза межами клінічного контакту. У зв’язку з цим структурована освіта пацієнтів і підтримка самокерування розглядаються як невід’ємні складові ведення хронічних захворювань на рівні первинної медичної допомоги.

Мета дослідження – узагальнити міжнародний досвід організації програм структурованої освіти пацієнтів («шкіл здоров’я»), проаналізувати їх теоретичні засади, клінічну та економічну ефективність, а також визначити практичні підходи до впровадження в системі первинної медичної допомоги України. Дослідження виконано у формі наративного огляду з елементами цільового аналізу доказової бази із залученням міжнародних клінічних настанов, систематичних оглядів, метааналізів і рандомізованих контрольованих досліджень.

Показано, що структурована освіта пацієнтів сприяє покращенню поведінкових показників, підвищенню самоефективності та прихильності до лікування, а також супроводжується клінічно значущими ефектами при основних НІЗ, зокрема цукровому діабеті 2 типу, артеріальній гіпертензії, хронічному обструктивному захворюванні легень і серцевій недостатності. Такі програми асоціюються зі зниженням частоти госпіталізацій і є економічно доцільними. Водночас встановлено, що одноразові освітні втручання не забезпечують стійкого ефекту, тоді як тривалі результати досягаються за умови подальшого супроводу пацієнтів і інтеграції цих програм у рутинну практику.

В Україні реформа первинної медичної допомоги створила необхідні організаційні передумови, зокрема значне охоплення населення та впровадження електронної системи охорони здоров’я. Разом із тим впровадження

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структурованої освіти пацієнтів обмежується відсутністю уніфікованих програм, належних механізмів фінансування та підготовлених фахівців. Додаткові труднощі пов’язані з воєнним контекстом і потребами вразливих груп населення.

Перспективним є поетапний підхід до впровадження, що передбачає пілотне запровадження стандартизованих програм для пацієнтів з артеріальною гіпертензією та цукровим діабетом 2 типу з подальшим масштабуванням на рівні системи первинної медичної допомоги.

Ключові слова: неінфекційні захворювання; первинна медична допомога; школи здоров'я; терапевтична освіта пацієнтів; самокерування; COM-B; Health Belief Model; самоефективність; DESMOND; Україна.

Introduction. Non-communicable diseases (NCDs) account for over 74% of all deaths globally [1]. In Ukraine, cardiovascular diseases, diabetes mellitus, chronic obstructive pulmonary disease (COPD), and oncological conditions constitute the principal burden of morbidity and mortality. A defining feature of these conditions is that treatment outcomes depend not only on appropriately prescribed pharmacotherapy, but also on patients’ day-to-day decisions: what to eat, how to remain physically active, when to measure blood pressure or glycaemia, and how to recognise symptoms of exacerbation. The majority of these decisions are made outside the clinical encounter–between visits, which in primary care may occur only 2–4 times per year.

For this reason, organisations such as the World Health Organization, National Institute for Health and Care Excellence, Haute Autorité de Santé, and Centers for Medicare & Medicaid Services incorporate structured patient education into the minimum package of care for chronic conditions–not as an adjunct, but as a clinical necessity. International terminology describes structured, person-centred educational approaches aimed at developing patients’ self-management capacity [2].

In Ukraine, “health schools” have until recently functioned primarily as one-off health education lectures. Primary care reform (2017–2020)–including the introduction of family medicine, a declaration-based system, capitation payment, and the eHealth system–has created a new organisational foundation. As of early 2025, over 34 million declarations indicate substantial population coverage by primary care services. However, a mechanism for translating this coverage into structured educational support for patients with NCDs has yet to be established. Aim of the study: to synthesise international experience of structured patient education (“health schools”) for individuals with non-communicable diseases (NCDs) in primary care, to substantiate the theoretical mechanisms underpinning their effects, to analyse their clinical and economic effectiveness, and to formulate practical implementation guidance for Ukraine.

Materials and Methods. The article was prepared as a narrative review with elements of targeted evidence synthesis, without protocol registration in PROSPERO. The literature search was conducted in February–March 2026 across PubMed/ MEDLINE, the Cochrane Library, Embase, CINAHL, Web of Science, and Scopus, as

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well as on the official portals of the World Health Organization, National Institute for Health and Care Excellence, Haute Autorité de Santé, Légifrance, Centers for Medicare & Medicaid Services / Centers for Disease Control and Prevention, the Ministry of Health of Ukraine, and the National Health Service of Ukraine.

Search terms (used individually and in combination) included: "therapeutic patient education", "self-management education and support", "chronic disease self-management", "structured education", "primary care", "cost-effectiveness", "hypertension self-management", "COPD self-management", "heart failure self-management", "self-efficacy", "COM-B", "health belief model", and "randomized trial".

Inclusion criteria comprised: (1) educational or self-management support programmes for NCDs (type 2 diabetes mellitus, hypertension, chronic obstructive pulmonary disease, heart failure, multimorbidity); (2) implementation in primary care or integration with primary care services; (3) availability of effectiveness evaluation (randomised controlled trials, meta-analyses, systematic reviews) and/or economic evaluation; (4) official guidelines from authoritative organisations. Exclusion criteria included: purely informational campaigns without a structured educational component; programmes lacking a clear description of the intervention and outcomes; hospital-based programmes without linkage to primary care; and studies unavailable in full text.

Literature selection was performed iteratively with emphasis on high-quality evidence sources, including international guidelines, systematic reviews, meta-analyses, and landmark randomised controlled trials relevant to primary care implementation.

Table 1

Characteristics of key included sources

No	Author, Year	Study Type	NCD	Format / Design	Key Outcomes	Level of Evidence
1	WHO/Europe, 2023	Guideline	NCDs	Therapeutic patient education (TPE), conceptual document	Principles; standards	D
2	NICE NG28, 2026	Guideline	Type 2 diabetes mellitus	Requirements for structured education	Quality standards	A
3	Davies et al., 2008	Cluster RCT	Type 2 diabetes mellitus	DESMOND, 6 hours, n=824	↓ weight; ↑ smoking cessation; ↑ illness beliefs	1b
4	Khunti et al., 2012	RCT follow-up	Type 2 diabetes mellitus	DESMOND, 3 years	Attenuation of effect without ongoing support	1b

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No	Author, Year	Study Type	NCD	Format / Design	Key Outcomes	Level of Evidence
5	Gillett et al., 2010	Economic evaluation	Type 2 diabetes mellitus	DESMOND	ICER ~£2,092/ QALY; 70% probability of cost-effectiveness	2
6	Dineen-Griffin et al., 2019	Systematic review	NCDs (primary care)	58 RCTs	Personalisation and follow-up as key determinants	1a
7	Conn et al., 2015	Meta-analysis	Hypertension	37 RCTs, n>9,000	↓ SBP by 3.9 mmHg; ↑ adherence	1a
8	Ettehad et al., 2016	Meta-analysis	Hypertension	123 RCTs, >600,000 participants	↓ SBP by 10 mmHg → ↓ CVD risk by 20%	1a
9	Stephen et al., 2022	Systematic review and meta-analysis	Hypertension (primary care)	Nurse-led interventions	↓ blood pressure; ↑ medication adherence	1a
10	Schrijver et al., 2022	Cochrane review	COPD	Self-management interventions	↓ hospitali-sations due to exacerbations; ↑ quality of life	1a
11	Jonkman et al., 2016	IPD meta-analysis	Heart failure	20 RCTs, n>5,000	↓ hospitalisations; ↓ mortality	1a
12	Zhao et al., 2021	Systematic review and meta-analysis	Heart failure	Self-management interventions	↓ readmissions; ↑ self-management effectiveness	1a
13	del Campo Peña et al., 2016	Programme description	Multimorbidity	Peer-led, 7–8 weeks, n=8–15	↑ self-efficacy; cultural transformation	3
14	Eltigany et al., 2025	Scoping review	NCDs (LMICs)	25 primary care models	Patient education included in 84% of models	2a
15	Bonoto et al., 2017	Systematic review and meta-analysis	Type 2 diabetes mellitus	Mobile app–based self-management	↓ HbA1c; improved self-management	1a
16	Prawesti et al., 2025	Systematic review	COPD	Mobile health–based self-management interventions	Improved adherence and continuity of care	1a

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Understanding why some educational programmes lead to behavioural change while others do not requires recourse to behavioural theory. The three conceptual frameworks selected in this study are complementary and together provide a sufficient theoretical foundation for the design of structured patient education programmes.

The first framework–Self-efficacy theory–proposes that confidence in one's ability to perform a specific behaviour is a stronger predictor of adherence than knowledge alone [14]. Structured education programmes operationalise self-efficacy through practical exercises, peer learning, supportive feedback, and behavioural reinforcement.

The second framework–the COM-B model – conceptualises behaviour as the result of the interaction of three conditions: *Capability* (knowledge and skills), *Opportunity* (external conditions and social environment), and *Motivation* (automatic and reflective processes driving action) [15]. A programme that targets only capability (i.e. knowledge transfer) but fails to address opportunity (e.g. access, environmental support) and motivation (e.g. action planning, motivational interviewing) will have limited effectiveness.

The third framework–the Health Belief Model–explains variability in adherence among patients with similar levels of knowledge [16]. Behaviour is shaped by the individual's subjective illness perceptions, including *perceived susceptibility* ("am I at risk of complications?"), *perceived severity* ("how serious is the condition?"), *perceived benefits*, and *perceived barriers*. In hypertension, a common issue is low perceived susceptibility ("I do not feel ill"), leading to poor adherence. In chronic obstructive pulmonary disease, low perceived benefit and disease-related stigma may reduce engagement in self-management programmes. Addressing illness perceptions is therefore not a "soft" component, but a clinically justified intervention. In the DESMOND study, illness beliefs (measured using the Brief Illness Perception Questionnaire, Brief IPQ) were the only outcomes that retained statistical significance at three-year follow-up [17].

Table 2

Application of three theoretical frameworks in the design of structured patient education programmes.

Concept	Key Mechanism	Application in the Programme	Assessment Tools
Self-efficacy theory	Confidence in one's ability to perform specific actions	Practical exercises, peer learning, supportive feedback	GSE, DES-SF, CSES, SCHFI
COM-B model (Michie, 2011)	Simultaneous influence on Capability + Opportunity + Motivation	Skills training + accessible environment + action planning	Behavioural functional analysis
Health Belief Model	Subjective perception of risk and barriers	Addressing illness beliefs, destigmatisation, personalised "nudges"	Brief IPQ, IPQ-R

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Together, these frameworks explain how structured education translates knowledge into sustained self-management behaviour and improved clinical outcomes. Based on the findings of this review, a three-layer implementation model of structured patient education in primary care is proposed (Figure 1). The model integrates behavioural mechanisms, system-level implementation processes, and clinical outcomes.

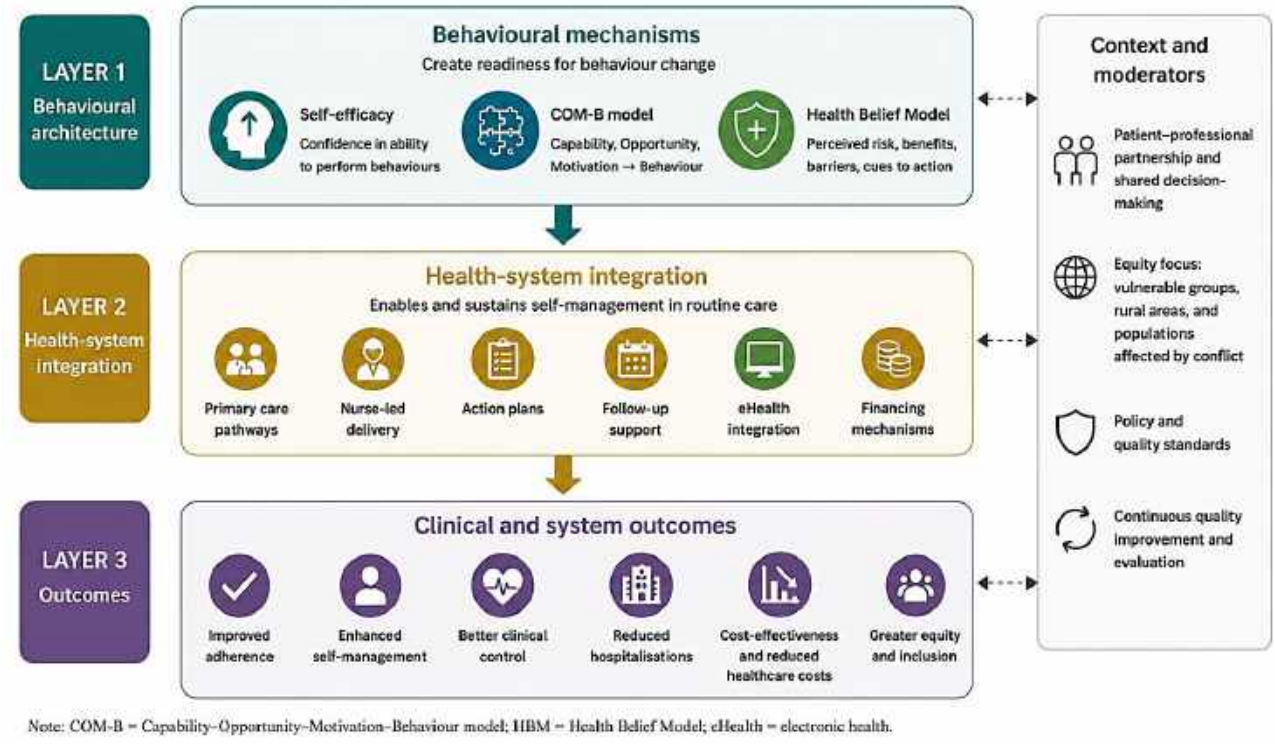

Figure 1. Proposed three-layer implementation model of structured patient education in primary care.

Results and Discussion. The narrative analysis, informed by the proposed three-layer implementation model (Figure 1), identified five archetypal models of structured patient education that differ in regulatory status, format, and funding mechanisms. The UK model is the most robustly evidence-based within primary care: structured group education for type 2 diabetes mellitus is a clinical requirement under NICE, with clearly defined quality standards (evidence-based curriculum, trained facilitators, cultural adaptation, and annual review) [3,6].

The French model (TPE/Haute Autorité de Santé) demonstrates how patient education can be institutionalised through regulation: the *cahier des charges* mandates formal programme description, authorisation, and evaluation for each educational intervention [4,7]. The German model (DMP) establishes a tightly integrated "standard–accreditation–reimbursement–evaluation" pathway: physicians are required to offer structured education, and funding is provided only for programmes that are standardised and state-evaluated.

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The US model (DSMT/Centers for Medicare & Medicaid Services) introduces a dedicated reimbursement mechanism: 10 hours of initial education plus 2 hours per year of follow-up, with mandatory referral and documentation [5,8].

The Spanish model (Basque Active Patient Programme) represents a peer-led format (groups of 8–15 participants over 7–8 weeks, led by a trained patient) [18]. It demonstrates a strong impact on self-efficacy, but requires cultural transformation–implementation studies report resistance among some clinicians during early adoption.

Table 3

Comparative characteristics of international structured patient education models

Model	Target Group	Duration	Funding	Theoretical Framework	Key Lesson for Ukraine
United Kingdom (DESMOND/National Institute for Health and Care Excellence)	Type 2 diabetes mellitus	6 hours + annual review	NHS	Health Belief Model, Self-efficacy theory	Programme quality is more important than mere delivery
France (TPE/Haute Autorité de Santé)	All NCDs	Variable	State-funded	Andragogy	Regulatory authorisation prevents variability in quality
Germany (DMP)	NCDs	Cyclical	Insurance-based	COM-B model	No sustainability without a funding model
United States (DSMT/Centers for Medicare & Medicaid Services)	Diabetes mellitus	10 hours + 2 hours/year	Medicare	Self-efficacy theory	Education functions as a distinct reimbursement mechanism
Spain (Basque Active Patient Programme)	Multimorbidity	7–8 weeks	Regional	Self-efficacy theory	Peer-led models require cultural readiness

A cluster randomised controlled trial of DESMOND for type 2 diabetes mellitus (n=824; 207 primary care practices; 6 hours of structured group education) remains the benchmark study for primary care [9]. At 12 months, HbA1c did not differ significantly between groups; however, the intervention group demonstrated greater weight loss, higher rates of smoking cessation, improved illness beliefs, and lower levels of depressive symptoms. These findings suggest that the effects of structured education are mediated primarily through behavioural and psychological mechanisms rather than direct biomarker modification. Three-year follow-up data showed attenuation of effects

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in the absence of ongoing support, indicating that structured patient education should be considered the initial phase of a continuous care model rather than a standalone intervention [10]. Economic evaluation of DESMOND reported an ICER of approximately £2,092/QALY under scaled implementation, with a 70% probability of cost-effectiveness at a £20,000 threshold [11].

Hypertension remains the most prevalent NCD in Ukraine (>12 million individuals). A meta-analysis including 37 RCTs (n>9,000) demonstrated that combining structured education with blood pressure self-monitoring reduces systolic blood pressure by 3.9 mmHg and improves medication adherence [19]. A meta-analysis including more than 600,000 participants demonstrated that each 10 mmHg reduction in systolic blood pressure is associated with a 20% decrease in cardiovascular risk [20]. Nurse-led educational programmes in hypertension management are effective and allow for scalable implementation without excessive physician workload [21]. From the perspective of the Health Belief Model, the principal barrier in hypertension is the "asymptomatic trap" (low perceived susceptibility), whereby patients do not perceive themselves as ill and therefore underestimate risk. Educational interventions should explicitly address the concept of "silent risk" and the role of daily self-monitoring in stroke prevention.

A Cochrane review of self-management interventions in chronic obstructive pulmonary disease found that programmes incorporating personalised action plans reduce hospitalisations due to exacerbations and improve quality of life. Effective COPD programmes should integrate education, breathing technique training, and written action plans as part of routine self-management support [22].

Up to 25–30% of hospitalisations for heart failure are potentially preventable. A meta-analysis including more than 5,000 patients demonstrated that structured self-management programmes for heart failure reduce hospitalisations and mortality [23]. Effectiveness appears greater when education is combined with remote monitoring and caregiver involvement. Additional evidence suggests that programmes incorporating caregiver support and follow-up strategies achieve greater effectiveness in patients with heart failure [24].

A review of multimorbidity found that patient education was included in 84% of primary care models for NCDs in low- and middle-income countries [13]. Patients with coexisting diabetes, hypertension, and COPD cannot realistically attend multiple condition-specific programmes, highlighting the need for transdiagnostic approaches such as CDSMP and related programmes that address shared competencies such as symptom management, treatment adherence, physical activity, and psychological adaptation [25].

A systematic review demonstrated that effective primary care interventions combine structured patient–provider interaction, individual counselling, ongoing follow-up, self-help materials, personalised action planning, and coping strategies [12]. Programmes incorporating group formats, peer learning, and motivational interviewing consistently show superior outcomes. An effective structured patient education

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programme is therefore not a didactic session, but a behavioural architecture designed through the integrated application of the COM-B model, Self-efficacy theory, and Health Belief Model frameworks. The findings of this review suggest that the effectiveness of structured patient education depends not only on behavioural mechanisms, but also on integration into routine primary care pathways and longitudinal system-level support. Educational interventions based solely on information transfer are unlikely to produce sustained clinical effects without organisational embedding, follow-up structures, and financing mechanisms.

In the Ukrainian context, the 2017–2020 primary care reform established family medicine, a declaration-based system (>34 million registered patients), capitation financing, and eHealth infrastructure. However, physician workload often exceeds 1,700 patients, with consultation times of 15–20 minutes–conditions under which comprehensive educational interventions cannot be delivered within routine visits. Practice nurses are formally part of the primary care team, yet their role remains largely administrative. Expanding towards nurse-led education represents the most feasible pathway for scaling without increasing physician burden.

Clinical protocols of the Ministry of Health of Ukraine (Orders No. 1118, 384, 555) include references to patient education but lack standardised requirements regarding content, duration, and evaluation. Structured patient education is not included in the reimbursement framework of the Medical Guarantees Programme, constituting a critical systemic barrier. A positive signal is that NCD control indicators (e.g. proportion of patients with documented HbA1c or controlled blood pressure) are included in National Health Service reporting, indirectly incentivising outcome-oriented educational interventions.

Key barriers to implementation in Ukrainian primary care include organisational, workforce, financial, and cultural limitations. Major challenges include the absence of standardised curricula, insufficient training in facilitation and motivational interviewing, lack of reimbursement mechanisms, and persistence of paternalistic clinician–patient communication models. Equity considerations are critical: access remains uneven, with lower participation among individuals with lower educational attainment, older adults, rural populations, and internally displaced persons (>3.7 million), despite higher need. Veterans with comorbid NCDs and post-traumatic stress disorder require adapted programme formats. The principle of equity by design should therefore be considered a core requirement rather than an optional feature of programme development.

In addressing the implementation of structured patient education in Ukraine, a phased systems-level approach is required. The initial priority is the development of standardised curricula for major non-communicable diseases, combined with workforce training in facilitation, motivational interviewing, and action planning for family physicians and nurses.

The next stage involves integration into routine primary care pathways through eHealth-based referral, documentation, and follow-up mechanisms, alongside the

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introduction of dedicated financing through the Medical Guarantees Programme or pay-for-quality indicators of the National Health Service of Ukraine.

Finally, implementation should include continuous evaluation and gradual scale-up. Assessment should incorporate clinical outcomes (e.g. HbA1c, blood pressure, FEV_1), behavioural indicators (medication adherence, physical activity, smoking status), patient-reported outcomes, and healthcare utilisation measures, with follow-up performed at baseline, immediately post-programme, and at 6–12 months.

Table 4

Minimum quality requirements for structured patient education programmes

Criterion	**Minimum Requirement**	**Performance Indicator**
Curriculum	Written, structured, with defined learning objectives	Approved programme document available
Duration	≥4–6 hours initial course; booster ≥1 every 6 months	Documented duration
Format	Group-based or individual, with equivalent standards	Session protocol
Facilitators	Train-the-trainer certification; accredited CPD	Training certificate
Action plan	Written, individualised, recorded in medical record	Document in eHealth
Follow-up	≥1 contact within 3–6 months	Recorded follow-up entry
Evaluation	Pre/post: clinical and patient-reported outcomes	Data recorded in report/eHealth
Integration	Automatic referral via eHealth	Electronic referral documented
Financing	Service code or P4Q indicator (National Health Service of Ukraine)	Tariff line established
Equity	Adapted formats for internally displaced persons, older adults, and individuals with limited mobility	Adaptations specified in curriculum

Digital tools may support self-management, adherence, follow-up, and outcome documentation [26,27]. The eHealth system additionally enables automation of referrals and monitoring processes. However, the digital divide among older adults and populations affected by armed conflict limits the feasibility of fully remote delivery, indicating that digital formats should complement face-to-face educational interventions rather than replace them.

This review is narrative in nature and was not registered in PROSPERO, which limits reproducibility. The evidence base is heterogeneous: for type 2 diabetes mellitus, numerous RCTs and meta-analyses are available in primary care settings, whereas for hypertension, chronic obstructive pulmonary disease, and heart failure, part of the evidence is extrapolated from mixed populations. Most studies were conducted in countries with well-developed primary care systems (United Kingdom, United States,

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Spain, Germany), limiting direct generalisability to Ukraine. Publication bias is possible, although partially mitigated by inclusion of large Cochrane reviews with formal risk-of-bias assessment. National regulatory documents (Ministry of Health of Ukraine and National Health Service of Ukraine) require verification at the time of publication.

Conclusions

1. Structured patient education should be regarded as a standardised clinical intervention integrated into chronic disease management rather than as a purely informational activity. Programmes based on behavioural and self-management principles consistently demonstrate superior effectiveness compared with one-off educational approaches.

2. Current evidence supports the effectiveness and cost-effectiveness of structured self-management programmes across major non-communicable diseases, including type 2 diabetes mellitus, hypertension, chronic obstructive pulmonary disease, heart failure, and multimorbidity.

3. Sustainable effects require integration into continuous care pathways incorporating follow-up, booster sessions, action planning, and digital or telephone support. Educational interventions delivered as isolated activities are unlikely to produce long-term behavioural change.

4. In Ukraine, implementation is currently limited by the absence of standardised curricula, financing mechanisms, and trained facilitators despite the availability of primary care and eHealth infrastructure.

5. Pilot implementation of standardised programmes for hypertension and type 2 diabetes mellitus represents the most feasible initial strategy for Ukrainian primary care, with subsequent scale-up based on multidimensional outcome evaluation.

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