



Assessment of the effectiveness of teaching patients with heart failure in hospital settings

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Abstract. Heart failure is one of the leading causes of hospitalisation, disability and mortality among elderly people. Effective secondary prevention requires adequate patient education, and nurses play a key role in implementing educational measures at a professional level. The aim of the study was to comprehensively evaluate the effectiveness of an educational programme in improving the knowledge of patients with heart failure in hospital settings. The study involved 62 patients with stage IIA,B heart failure aged 33 to 82 (56.3 ± 11.7) years, 76% men and 24% women. All patients underwent a knowledge assessment at the beginning of hospitalisation and on the day of discharge after receiving training in a hospital setting. Information on the effectiveness of training was collected over a period of 6 months. The main results showed that patients who participated in the training programme improved their knowledge of heart failure (from 72.58% to 82.25%), symptom recognition (from 36.51% to 78.06%), behaviour (from 44.89% to 58.86%), nutrition (from 31.12% to 69.34%), and recommended treatment (from 35.24% to 58.51%). Most realised the importance of daily weighing (64.51%), limited their consumption of table salt (77.41%), fluids (74.19%) and alcohol (77.41%). A significant proportion gave up smoking during hospitalisation (91.93%) and partially maintained this trend after discharge (67.74%). Patients visited their cardiologist more often (61.29%), kept a symptom monitoring diary (96.77%), independently adjusted their intake of diuretics (72.58%) and potassium-containing drugs (59.67%), and did not miss any doses of medication (80.64%). It has been proven that higher patient knowledge was associated with the educational information received from a nurse during hospitalisation. The practical value of the results was to justify the need to master the skills of weighing, determining the degree of oedema, and keeping a diary of monitoring symptoms of heart failure in outpatient settings

Keywords: nurse; educational programme; awareness; effectiveness; diary; continuous care

✦ INTRODUCTION

The leading cause of death worldwide is cardiovascular disease, and its final stage is considered to be heart failure (HF). It is one of the major health problems, accompanied by high rates of morbidity, hospitalisation and mortality. It is a clinical syndrome with symptoms and/or signs caused by structural or functional changes in the heart and objective manifestations of pulmonary or systemic congestion. The prevalence of heart failure is expected to continue to increase worldwide, both among people over 65 and in younger age groups [1]. This trend is due to demographic factors (ageing population), an increase in the prevalence of obesity and arterial hypertension, increased survival after myocardial infarction, and high comorbidity.

A study by M. Montalto *et al.* [2] noted that in people over 70 years of age, the prevalence of HF exceeds 10%; in the group under 55 years of age, it is about 1%. This confirms that heart failure is not exclusively a problem of older patients, but has a tendency to “rejuvenate”. Epidemiological forecasts indicate a steady increase in the number of patients. For example, B. Chong *et al.* [3] reported that as of 2024, approximately 6.7 million Americans over the age of 20 have HF, and the prevalence is expected to increase to 8.7 million in 2030, 10.3 million in 2040, and 11.4 million by 2050. Similar trends have been observed in Europe: according to B. Bozkurt *et al.* [4], around 1.7% of the population are affected, with the proportion continuing to increase. In

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their review, H.O. Slabkiy & I.I. Koshelia [5] presented the dynamics of mortality from cardiovascular diseases among the adult population. In the Chernivtsi region, 1,038.5 deaths per 100,000 population were recorded in 2021, with ischaemic heart disease among the causes (about 958.4 cases per 100,000 population). This level exceeds the average in many European countries, which highlights the high local significance of the problem and the need for targeted preventive measures. This trend has emphasised the need for large-scale preventive and medical-social measures.

In such conditions, the need to involve patients in actively managing their condition becomes obvious. Educational nursing interventions proposed by T. Jaarsma *et al.* [6] improve the self-management and self-care skills of patients with heart failure, especially when using a personalised action plan and early post-discharge follow-up. At the same time, low patient motivation and limited resources remain barriers, requiring personalised and culturally adapted approaches. An analysis by S.R.G. Marques *et al.* [7] showed that post-discharge educational interventions by nurses reduced the risk of rehospitalisation by 36% and the risk of death by 35% compared to the control group, highlighting the clinical significance of such programmes. An important condition for the effectiveness of such measures is their continuity and the availability of feedback between the nurse and the patient, in particular through platforms or regular visits. At the same time, a study by S. Stahlman *et al.* [8] revealed gaps in patients' knowledge prior to discharge, including limited understanding of exacerbation symptoms, rules for adhering to therapeutic regimens, and dietary guidelines. This indicated a need for a more systematic approach to pre- and post-discharge education, which should be an integrated part of the patient's journey. In addition, psycho-emotional factors such as stress, anxiety, and low social support were associated with poorer treatment adherence, according to a review by A.V. Metts *et al.* [9]. Therefore, nursing interventions should also include basic psychological support skills, teaching patients stress management techniques, and, if necessary, referral to mental health specialists. In Ukraine, the educational programme for patients with arterial hypertension proposed by N. Palibroda *et al.* [10] for patients with arterial hypertension has demonstrated high effectiveness: it increased knowledge about the disease by 47.07%, risk factors by 50.88%, and possible complications by 58.82%, and also contributed to an increase in the proportion of patients with controlled blood pressure and pulse. This confirmed that educational interventions are an important complement to drug treatment and should be integrated into family medicine practice.

No systematic official programmes or initiatives aimed at educating patients with heart failure were identified as of 2025. Given this absence, the aim of the study was to conduct educational activities for patients in hospital settings with the active participation of nurses in order to increase their knowledge and further analyse the results obtained.

✦ MATERIALS AND METHODS

An anonymous survey was conducted to collect data, ensuring complete confidentiality and protection of respondents' personal information. Participants were informed about the purpose of the study and voluntary participation, and had the opportunity to refuse to participate without

any negative consequences. The training was conducted at the regional communal non-profit enterprise (RCNPE) "Chernivtsi Cardiology Centre", with the participation of the senior nurse of General Cardiology Ward No. 1. The study was carried out over six months, covering the entire data collection and analysis period. Patients were purposely selected according to established inclusion and exclusion criteria. Sixty-two patients (76% men, 24% women) aged 33 to 82 (56.3 ± 11.7) years with diagnosed HF of NYHA functional classes I-IV and II-A (79%), II-B (21%) stages according to the classification of M.D. Strazhesko and V.H. Vasilenko, which corresponds to stage C according to the Recommendations of the All-Ukrainian Association of Cardiologists of Ukraine on the diagnosis, treatment and prevention of chronic heart failure (CHF) [11]. During the development of the training programme, factors that could potentially influence the assimilation of information by patients were taken into account, such as education (32 people (52.51%) had higher education, 4 people (6.45%) had incomplete higher education, 23 (37.18%) had secondary education, and 3 people (4.83%) had incomplete secondary education); employment (36 patients (58%) were employed); marital status (47 (76%) were married and had a family, 13 (21%) were widowed); comorbidity (17 (27%)); left ventricular ejection fraction (LVEF) (average 50% (32/66)); duration of heart failure (7.2 ± 1.5 years); length of hospitalisation (7.3 ± 0.4 days); complaints during hospitalisation (33 patients (53%) had shortness of breath, 32 (52%) had discomfort, tightness behind the breastbone, palpitations, 32 (52%) had general weakness, dizziness, headache, 28 (45%) had increased blood pressure, 21 (34%) had peripheral oedema in the lower extremities, and pastiness of the lower legs. All patients (100%) had a history of ischaemic heart disease, 35 (56%) had atherosclerotic disease, 8 (13%) had a history of myocardial infarction, 17 (27%) had chronic atrial fibrillation, and 39 (63%) were receiving outpatient treatment with cardiac and diuretic drugs. The exclusion criteria were patients under 30 years of age, with stage I HF, hospitalisation for less than 5 days, those who were transferred to other departments, had functional limitations and cognitive impairments, insufficient digital literacy, and no access to the internet.

The training programme consisted of one 2-hour session covering theoretical material and practical skills. The theoretical part included a discussion with relevant patients about the causes of heart failure, symptoms, clinical manifestations, a low-salt diet, fluid control, weight control, behaviour in case of exacerbation of symptoms, physical activity, and drug treatment. The practical part included skills for determining the degree of oedema, weighing, determining sodium in food portions, and keeping a diary to monitor symptoms of heart failure in an outpatient setting. To reinforce the knowledge gained, patients were given paper handouts based on the colour-coded "traffic light" system with a QR code containing practical recommendations for self-care in an outpatient setting. Green indicated acceptable symptoms, "yellow" indicated symptoms that should raise concern and be reported to a nurse or family doctor, and "red" indicated symptoms that required urgent action: immediately call the special number "5103" "Emergency Cardiological Care" (a service provided by the RCNPE "Chernivtsi Regional Clinical Cardiology Centre") (Fig. 1)

 No swelling (oedema) or puffiness on the feet, ankles, legs, or stomach, or no increase in existing swelling	 Pitting on feet and/or shins, often in the evening, with the indentation remaining for < 72 hours after pressing (sub-acute)	 5103 Legs/thighs/abdomen/lower back/ascites/hydrothorax during the day, chronic oedema (>3 months)
SWELLING		
 No change in the last week. BMI between 25 and 29.9	 An increase of 2-3 kg/1-2 days or 2.5-5 kg/week. BMI > 30	 5103 Weight loss/wasting (loss of body mass) of > 2 kg in 3 days
WEIGHT		
 No new or worsening shortness of breath or cough	 Sudden severe shortness of breath or difficult breathing during exertion (activity), dry hacking cough	 5103 Severe shortness of breath at night (cardiac asthma), shortness of breath when lying down/at rest, frequent wet cough with pink/frothy sputum, wheezing
BREATHING		
 No discomfort, tightness, or pain in the chest (heart)	 Pain, tightness, or heaviness in the heart area, pulse/palpitations slow/very rapid/irregular, BP lower/higher than usual	 5103 Chest pain that does not pass after taking nitrates, orthostatic hypotension (dizziness on standing)
CHEST PAIN		
 Normal emotional wellbeing	 Mild sadness or irritability, depression	 5103 Confusion (confused consciousness), severe depression
EMOTIONAL WELLBEING		
 No limitations	 Reduced activity level, fatigue (tiredness), weakness, palpitations, or shortness of breath	 5103 Any activity worsens heart failure symptoms
PHYSICAL ACTIVITY		
 Normal sleep pattern	 Insomnia or excessive sleepiness (somnolence)	 5103 Significant sleep problems: cannot lie flat (orthopnoea)
SLEEPING		
 Normal appetite	 Sudden increase in thirst or desire to drink (> 1-1.2 L/day), pain/discomfort, or increased sensitivity to food in the stomach	 5103 Loss of appetite, constant nausea and vomiting for more than two days, dehydration
FLUIDS AND DIET		

Figure 1. Memo for patients with heart failure

Note: BMI – body mass index. BP – blood pressure. 5103 – “Emergency cardiac care” (service provided by the RCNPE “Chernivtsi Regional Clinical Cardiology Centre”)

Source: developed by the author

Patients’ knowledge was assessed before and after training using the written version of the Atlantic Heart Failure Knowledge Test (AHFKT) version 3 (AHFKTv3), updated by B. Butts *et al.* [12]. The test consisted of 30 questions focusing on five areas of knowledge about self-care in HF: knowledge of the disease (2 questions), nutrition (10 questions), behaviour (6 questions), medication (7 questions) and symptoms (5 questions). Patients answered the questions by selecting one answer from the options provided. Individual answers were recorded and coded as correct (1 point) or incorrect (0 points). The total number of correct answers was counted and presented as a sum of points

(from 0 to 30 possible correct answers) and a percentage of correct answers (from 0% to 100%).

Statistical analysis and graphical presentation of the results were performed using the Microsoft Excel computer program package (Microsoft 365 licence, subscription status – active). The indicators are presented as the mean value with a confidence interval and standard error. Primary and secondary results were compared using parametric data for dependent (paired) samples using the paired t-test and Pearson’s χ^2 criterion for independent proportions. The mean values were given as $M \pm m$, where M is the arithmetic mean and m is the standard error of the mean.

Rank data in the diagrams are presented in the format of the median with lower and upper quartiles (M [Q1; Q3]). Categorical data are presented as the absolute number of cases (n) and the percentage (%) of the total number of the study group. Differences were considered statistically significant at $p \leq 0.05$ [13]. The study was approved by the Bioethics Committee of Bukovinian State Medical University (protocol No. 10, 2025) in accordance with the principles of bioethics set out in The World Medical Association [14] and the Universal Declaration on Bioethics and Human Rights [15]. All participants in this study provided informed written consent for the use of their medical records for scientific purposes, and personal identifiers were anonymised during data processing.

RESULTS AND DISCUSSION

When assessing the overall level of knowledge of patients based on 30 questions covering five areas of knowledge, significant unevenness in patients' preparedness for training was revealed. The most effective (in terms of the number of correct answers) was the area of knowledge about the disease in 72.58% (45/62), which indicates a basic understanding of the nature of heart failure. At the same time, the most

vulnerable area was behaviour at 56.45% (35/62), indicating an insufficient understanding of the necessary changes in daily life to control the condition. A similar trend was observed in the area of symptom recognition (58.06% – 36/62) and medication adherence (65.51% – 40/62), highlighting the need for targeted training on early detection of exacerbations and self-monitoring of drug therapy. The level of knowledge about nutrition (66.12% – 41/62) showed average awareness, but leaves room for improvement, especially given the importance of dietary restrictions in the management of patients with heart failure. Thus, the results showed that prior to training, patients had basic knowledge about the disease but serious gaps in the practical aspects of self-management, which is of direct clinical importance for the prevention of exacerbations and rehospitalisations. The participation of a nurse in training activities conducted in a hospital setting significantly increased patient awareness in all areas of knowledge from an average of 45.16% (28/62) to 69.35% (43/62) ($p = 0.0024$), which demonstrated the effectiveness of structured training in improving patients' understanding of key aspects of their disease. The dynamics of changes in patients' knowledge levels before and after short-term training are shown in Figure 2.

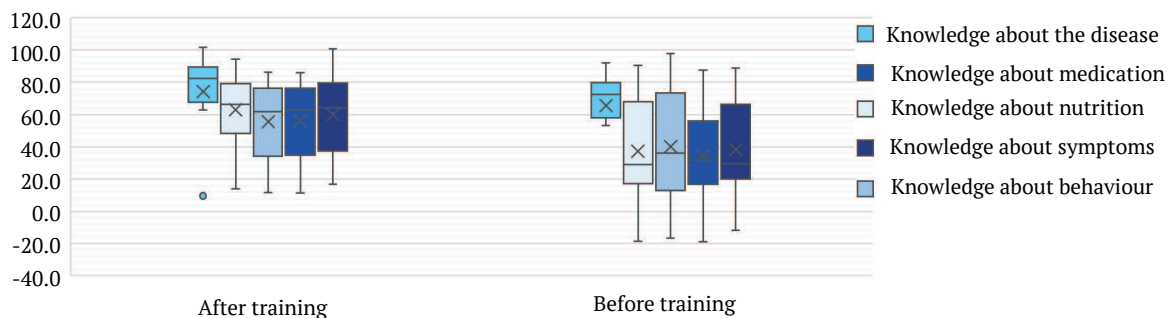


Figure 2. Dynamics of patients' knowledge levels based on survey results after and before training (%), Median [Q1; Q3]
Source: developed by the author

A detailed analysis of knowledge prior to training revealed that patients were most familiar with the basic concepts of heart failure, in particular its definition, causes and prognosis, and 62.90% (39/62) were aware that heart failure cannot be cured but must be controlled. The assessment of patients' knowledge of the disease after training did not reveal any statistically significant changes, as this section was already quite familiar. This indicates the presence of basic knowledge, but at the same time highlighted gaps in understanding the more complex aspects of self-care and symptom control, which was the subject of the educational programme. In a study by A. Zare-Kaseb *et al.* [16], it was noted that patients often have limited knowledge about their disease prior to training, which emphasises the importance of effective educational strategies.

Analysis of the results of the section on knowledge of heart failure symptoms revealed significant gaps in patients' understanding of the critical signs of exacerbation. The fewest patients were able to correctly answer the question about the need to inform their doctor in case of rapid weight change (2-3 kg in 1-2 days) as a sign of HF progression, which indicates a low ability to independently identify early signs of congestive phenomena

and respond to them in a timely manner. Even fewer were able to list the symptoms that require immediate medical attention, which highlights the need for more intensive education on the signs of serious complications. At the same time, a significant proportion of patients mistakenly believed that in heart failure, physical activity should be increased to reduce weight, indicating a risk of incorrect self-management of the condition and potential harm to health. Similar problems were found in a study by K. Borovyk [17], a significant proportion of patients with chronic heart failure against a background of ischaemic heart disease and metabolic disorders not only ignored the signs of exacerbation, but also failed to inform their doctor in a timely manner about changes in their condition, in particular due to insufficient awareness and low therapeutic adherence. J. Longhini *et al.* [18] noted that educational interventions can improve patients' knowledge of exacerbation symptoms, including the need to inform their doctor about rapid weight changes. Knowledge of ways to reduce thirst during fluid restriction was even less common – only 16.12% (10/62) of patients mentioned chewing gum or sucking on lozenges as effective methods, indicating the need for practical recommendations

on fluid intake control. At the same time, 88.70% (55/62) of patients correctly noted that if shortness of breath, pain or dizziness occurs during physical activity, they

should pause and rest, which indicates successful assimilation of the basic rules of safe physical activity in heart failure (Table 1).

Table 1. Dynamics of knowledge of patients with heart failure about the disease and symptoms before and after training

Area of knowledge	Indicator	Before training (% correct answers)	After training (% correct answers)	p-value (χ^2 test)
Knowledge of the disease	Heart failure – a condition in which the heart is unable to pump enough blood.	82.25	91.93	0.108
	Heart failure cannot be cured, but it can be controlled.	62.91	72.58	0.249
Knowledge of symptoms	Inform a doctor if lose 2 kg overnight.	24.20	77.41	<0.001
	Gaining 2-3 kg in a few days indicates fluid retention.	29.35	83.87	<0.001
	Fluid restriction can be controlled by chewing gum or sucking on hard candy.	24.19	91.93	<0.001
	A doctor should be informed of sudden weight gain, swelling, or increased shortness of breath in a short period of time.	16.12	41.93	0.002
	If breathlessness, chest pain, or dizziness occur during physical activity, activity should be stopped and rest taken.	88.71	95.16	0.187

Note: differences are considered statistically significant at p-value ≤ 0.05

Source: developed by the author

After the training intervention, patients' knowledge of heart failure and its symptoms improved in most aspects. Significant growth was observed in understanding the signs that require immediate notification of a doctor, such as sudden changes in body weight and oedema, as well as in practical methods of controlling fluid retention. This demonstrates the effectiveness of the educational programme in improving patients' ability to self-monitor and respond promptly to changes in their condition. Basic knowledge about the nature of heart failure and the possibility of controlling the condition was relatively high even before the training and showed only moderate improvement after the intervention, reflecting a stable level of initial awareness among patients. At the same time, some aspects remain less well understood, highlighting the need for regular reinforcement of information and integration of practical recommendations into training programmes to ensure safe self-management of therapy.

When assessing patients' knowledge of behavioural aspects of care prior to training, a significant proportion (80.64% – 50/62) of those surveyed had a basic understanding of the need to avoid salty foods, which is consistent with the results of previous studies by Y.W. Lee & C.N. Tseng [19], where about 80% of patients reported receiving relevant recommendations and only 25% of patients actually adhered to the diet. At the same time, patients' knowledge of harmful habits was uneven: almost all patients understood the importance of limiting alcohol consumption, but awareness of the harm caused by smoking remained insufficient, requiring additional individual work with patients. In particular, studies by N. Ding *et al.* [20] showed that smoking is an important modifiable risk factor for heart failure, and quitting smoking can significantly reduce the risk of developing this disease. C. Andersson *et al.* [21] also found that alcohol abuse can contribute to the development of cardiomyopathy and heart failure.

Aspects of self-control were less well understood: less than half of the patients weighed themselves daily, and only about a quarter (27.41% – 17/62) knew that the correct time of day for weighing was in the morning after

sleeping and urinating. The results coincided with international studies by S.H. Yang *et al.* [22], which confirmed insufficient mastery of practical aspects of self-monitoring, such as daily weighing. This indicated the importance of emphasising practical skills for daily monitoring, which directly affects the early detection of symptoms of exacerbation. After training, most patients realised the importance of daily weighing, and a significant proportion (71% (44/62)) correctly identified the optimal time for this – immediately after waking up in the morning. Although 83% (52/62) of patients understood the concept of cardiac rehabilitation, the majority (74.19% – 46/62) associated it only with slow physical exercises, which indicates an insufficient awareness of a comprehensive approach to rehabilitation, including psycho-emotional and educational components.

The current results showed that only about a quarter of patients with heart failure adequately understand the importance of preventive behaviour regarding vaccination and regular visits to a cardiologist. Similar data were presented in studies by G. Baudry *et al.* [23], where about 40% do not undergo an annual cardiological examination, while overall vaccination coverage in most countries does not reach the recommended level. This highlighted the critical need to include these topics in educational programmes, as they directly influence the reduction of the risk of complications and repeat hospitalisations. When assessing patients' knowledge of nutrition, the most widely understood point was "Restricting fluid intake as prescribed by a doctor" – almost half of those surveyed identified it correctly, indicating that patients were aware of the importance of controlling fluid intake in preventing exacerbations of heart failure. Similar data were obtained in studies by N. Uslu & A. Akça Sümengen [24], where patients with heart failure had limited knowledge of self-monitoring, particularly in terms of weight and fluid monitoring.

At the same time, significant gaps were observed in understanding products with different sodium content: only a small proportion of patients were able to correctly identify foods with high and low sodium content and correctly indicate the recommended daily sodium intake for

patients with heart failure (<3,000 mg/day), which may be due to different recommendations from healthcare professionals depending on the clinical stage of the disease. Although most patients have a basic understanding of the harmfulness of excessive salt intake, similar to the results of Y. He *et al.* [25], only about 20% pay attention to product labelling regarding salt content. Only 22.58% (14/62) correctly identified the list of products that fall under the concept of “liquid” (including milk, ice cream, yoghurt,

jelly, puddings, soups), and only 11.29% (7/62) were able to answer “how much sodium is contained in one serving of soup.” Significant gaps in patients’ knowledge of self-control, particularly in terms of fluid and sodium restriction, were also found by N.M. Taha *et al.* [26] and M. Nozawa *et al.* [27], which pointed to insufficient awareness of the role of dietary factors in controlling disease symptoms and emphasised the need for more detailed and systematic patient training (Table 2).

Table 2. Changes in the knowledge of patients with heart failure regarding nutrition and behavioural aspects before and after the training intervention

Area of knowledge	Indicator	Before training (% correct answers)	After training (% correct answers)	p-value (χ^2 test)
Knowledge about nutrition	Salt restriction (<3,000 mg/day).	20.96	77.41	<0.001
	Water, milk, ice cream, yoghurt, fruit drinks, soups are considered liquids.	22.58	69.35	<0.001
	Liquid restriction.	48.38	74.19	<0.001
	Foods high in sodium.	29.03	66.12	<0.001
	Foods that are the main source of sodium (salt) in the diet.	12.90	58.06	<0.001
	Foods low in sodium.	61.29	90.32	<0.001
	Dessert with the lowest sodium content.	62.90	83.87	<0.001
	Fast food with the lowest sodium content.	12.90	56.40	<0.001
	Number of servings in a can.	11.29	64.51	0.021
Knowledge about behaviour	Amount of sodium in one serving of soup.	29.03	53.22	0.004
	Tried to quit smoking.	58.08	67.74	0.265
	Limited alcohol consumption.	91.93	77.41	0.039
	Best time for daily weighing.	27.41	70.94	0.002
	Weigh themselves daily.	45.16	64.51	0.034
	People with HF exercise most days of the week.	20.96	43.51	0.008
Importance of annual vaccinations and regular visits to the doctor.	25.80	29.03	0.713	

Note: differences are considered statistically significant at p-value ≤ 0.05

Source: developed by the author

After the educational intervention, patients’ knowledge of nutrition and behavioural aspects of self-care improved significantly. A significant increase was noted in understanding the need to limit salt and fluid intake, as well as in identifying foods high and low in sodium. Patients were better able to navigate practical issues such as choosing low-sodium desserts and fast foods, as well as controlling portions and assessing the sodium content of soups, indicating an improvement in their ability to plan their own diets. In terms of behavioural aspects, there was a noticeable improvement in daily weighing, regular physical activity and choosing the optimal time for it. At the same time, some issues remained less well understood: patients’ efforts to quit smoking and limit alcohol consumption showed less improvement, and awareness of annual vaccinations and regular visits to a cardiologist remained insufficient. This highlighted the need to reinforce these topics and integrate practical recommendations into training programmes to ensure more complete assimilation of the knowledge necessary for safe self-management of therapy.

Prior to training, a significant knowledge gap was identified among patients in the area of drug treatment – only 35.23% (22/62) provided correct answers to the relevant questions. Patients were most knowledgeable about the section “Actions in the event of a missed dose.” Only about a third of respondents (32.25%; 20/62) did not stop

taking their medication when they felt better, which highlights the high risk of self-modification of therapy and potential deterioration of the condition. Assessing the level of adherence to drug treatment among patients with heart failure, N.M.Y.K. Bagyanantha *et al.* [28] also showed that only about 50% of patients adhered to the prescribed treatment. Knowledge about the action of diuretics was better – more than half of the patients understood that these drugs remove excess fluid and could name examples (Lasix, furosemide, torasemide), but only some of them were aware of the need for additional potassium intake during such treatment, indicating gaps in the safe use of medicines and the need for detailed explanation.

Even greater difficulties arose with other groups of drugs for the treatment of heart failure. Less than a quarter of patients understood the action of angiotensin-converting enzyme (ACE) inhibitors (reducing vascular spasms, reducing sodium retention and strengthening the heart) and could give examples of drugs in this group (Capoten, Vasotec, Lisinopril). Even fewer patients were familiar with the mechanism of action of beta-blockers (slowing the heart rate) and could name relevant examples (carvedilol, bisoprolol, metoprolol, atenolol). In a study by N. Uslu & A. Akça Sümengen [24], the authors noted that patients with heart failure often did not understand the mechanism of action of essential drugs such as ACE inhibitors and be-

ta-blockers. This indicates that most patients did not have the knowledge necessary to properly self-monitor their therapy, which increases the risk of complications and rehospitalisation.

Patients were least knowledgeable about the choice of over-the-counter painkillers for concomitant symptoms (e.g., headache) (Table 3). Such low awareness highlights the need to include practical advice on the safe use of medicines to relieve concomitant symptoms in educational programmes. Similar gaps in knowledge were noted in an international study by M. Nozawa *et al.* [27], where most patients with heart failure did not have a basic understanding of self-management of drug therapy. These results un-

derscore the need for systematic, practice-oriented patient education during hospitalisation, including explanations of drug mechanisms of action, recommendations for behavioural modification, and safe use of medications to control associated symptoms. Similarly, S. Stahlman *et al.* [8] found insufficient awareness of HF in more than 88% of hospitalised patients, associated with low adherence to treatment and an increased risk of rehospitalisation. It was noted that most patients had never participated in specialised educational programmes on HF (89%), only half (57.3%) of them were able to recognise the symptoms of disease exacerbation, and a significant proportion (25%) did not understand the goals of the prescribed pharmacotherapy.

Table 3. Changes in patients' knowledge before and after training on drug therapy (n = 62)

Field of knowledge	Indicator	Before training (% correct answers)	After training (% correct answers)	p-value (χ^2 test)
Knowledge about medication	Do not skip taking medication for HF when feeling better.	32.25	80.64	<0.001
	If a patient has missed a dose, they should take it as soon as they remember.	64.51	67.74	0.704
	Knowledge about diuretics (fluid removal).	54.83	72.58	0.048
	Knowledge about potassium (the need for additional intake during diuretic therapy).	40.32	59.67	0.033
	Knowledge about ACE inhibitors (relax blood vessels, prevent salt retention).	24.19	41.93	0.041
	Knowledge about beta-blockers (slow down heart rate).	17.74	58.06	<0.001
	Choice of over-the-counter medicines (painkillers, etc.).	12.90	29.03	0.032

Note: differences are considered statistically significant at p-value ≤ 0.05

Source: developed by the author

The data obtained showed that training significantly increased patients' awareness of drug therapy for heart failure. The greatest progress was noted in understanding the need for regular medication, even when feeling better (more than double, $p < 0.001$), as well as in knowledge about the role of beta-blockers ($p < 0.001$). A significant improvement was found in understanding of diuretics, potassium and ACE inhibitors. At the same time, knowledge about what to do if a dose is missed did not show significant dynamics ($p = 0.704$), indicating the need for additional emphasis on this issue during educational interventions. Overall, after training, patients became more conscious about pharmacotherapy, but there are still some gaps that need to be fixed.

According to J. Longhini *et al.* [18], systematic training improves patients' quality of life by 15-25%, increases self-control by 20-30% and understanding of the disease by 30-40%. The educational interventions conducted by A. Wondesen *et al.* [29], in particular informative brochures and training upon discharge, have proven their effectiveness. They significantly reduce the rate of rehospitalisation for HF (from 23% to 0% during a 30-day stay at home), the number of outpatient visits (from 35% to 19%) and improve adherence to medical recommendations (in 62% of patients), increase the level of high adherence to treatment from 73% to 89% and satisfaction to 80.35%. C.R.G. Marques *et al.* [7] pointed out that educational programmes conducted by nurses are an effective and cost-effective approach that can reduce readmissions

by 36% and mortality by 35% among patients with heart failure. N. Uslu & A. Akça Sümengen [24] believed that educating patients upon discharge is an effective intervention strategy in educational practice and includes recommendations that patients should know about medication, the course of the disease, diet, early self-recognition and control of symptoms, physical activity, contributes to improved clinical outcomes, self-care level, adherence to self-help measures, better adaptation at home, increases self-control and quality of life, and reduces treatment costs. Educational measures and symptom monitoring diaries proposed by D.K. Hryhorets & I.A. Plesh [30] improved self-care in outpatient settings to a moderate to high level in 82.7% of patients during 30 days of HF symptom control.

Overall, the results confirmed that structured educational intervention can significantly improve patients' knowledge of key aspects of HF pharmacotherapy, but there is still a need for more in-depth and repeated training on more complex issues (ACE inhibitors, over-the-counter medications). The results emphasised the critical role of patient education as a key component in successful HF management. Despite the availability of clinical guidelines on salt and fluid restriction, weight control, physical activity and psycho-emotional status, most patients considered these aspects to be secondary or remained insufficiently informed. In addition, a lack of knowledge was identified in self-monitoring of medication intake and symptom recognition.

◆ CONCLUSIONS

The analysis confirmed the effectiveness of short-term educational intervention organised in a hospital setting with the participation of a nurse, which increased the level of knowledge of patients with heart failure by 23.58%. Patients with heart failure gained a better understanding of the causes and course of the disease (82.25%), were more confident in recognising symptoms (78.06%), and were better informed about nutrition (69.34%) and behaviour during illness (58.86%). A significant increase in knowledge was also recorded in the area of drug treatment (58.51%), where it became particularly important to understand the inadmissibility of arbitrarily discontinuing medication when feeling better. At the same time, there was an increase in understanding of the mechanisms of modern therapy and the ability to navigate treatment regimens. An important achievement was the consolidation of practical skills: most patients began to weigh themselves regularly, control their salt and fluid intake, and more than two-thirds gave up harmful habits. The symptom monitoring diary proved to be particularly valuable, as it became a tool

for increasing patients' responsibility for their own health, facilitating the timely detection of signs of decompensation and improving communication with healthcare professionals. Thus, the educational programme of nursing support has proven its effectiveness as a promising direction in the long-term control of heart failure, as it contributes to improving the quality of life of patients, builds their confidence in self-monitoring and strengthens their commitment to treatment. In future studies, it would be advisable to develop and test a programme of continuous nursing care using modern methods of remote counselling and patient self-monitoring.

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None.

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Оцінка ефективності навчання пацієнтів із серцевою недостатністю в стаціонарних умовах

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Анотація. Серцева недостатність є однією з провідних причин госпіталізації, інвалідизації та смертності людей похилого віку. Ефективна вторинна профілактика передбачає належне інформування пацієнтів, а медичні сестри відіграють ключову роль у реалізації освітніх заходів на професійному рівні. Метою дослідження була комплексна оцінка ефективності навчальної програми у підвищенні рівня знань хворих на серцеву недостатність в стаціонарних умовах. У дослідженні було залучено 62 хворих із серцевою недостатністю ІА,Б стадії віком від 33 до 82 ($56,3 \pm 11,7$) років, чоловіків – 76 %, жінок – 24 %. Усім хворим проведено оцінку знань на початку госпіталізації та в день виписки після отриманого навчання в умовах стаціонару. Інформацію про ефективність навчання збирали протягом 6 місяців. Основні результати показали, що пацієнти, які взяли участь у навчальній програмі, покращили свої знання про серцеву недостатність (з 72,58 % до 82,25 %), розпізнавання симптомів (з 36,51 % до 78,06 %), поведінку (з 44,89 % до 58,86 %), харчування (з 31,12 % до 69,34 %), рекомендоване лікування (з 35,24 % до 58,51 %). Більшість усвідомили важливість щоденного зважування (64,51 %), обмежили споживання кухонної солі (77,41 %), рідини (74,19 %) й алкоголю (77,41 %). Значна частина відмовилася від паління під час госпіталізації (91,93 %) та частково зберегли цю тенденцію після виписки (67,74 %). Пацієнти частіше зверталися до кардіолога (61,29 %), вели щоденник моніторингу симптомів (96,77 %), самостійно коригували прийом діуретиків (72,58 %) і калійвмісних препаратів (59,67 %), а також не допускали пропусків у прийомі ліків (80,64 %). Доведено, що вищий показник знань пацієнтів був пов'язаний із отриманою навчальною інформацією від медичної сестри під час госпіталізації. Практична цінність результатів полягала в обґрунтуванні необхідності опанування навичок зважування, визначення ступеня набряків, ведення щоденника моніторингу симптомів серцевої недостатності в амбулаторних умовах

Ключові слова: медична сестра; освітня програма; обізнаність; результативність; щоденник; безперервний догляд