AHEAD OF PRINT

Indicators of integrated care for patients with chronic cardiovascular disease in ambulatory care

Elżbieta Szlenk-Czyczerska[1,A–F], Donata Kurpas[2,A–F]

[1] Institute of Health Sciences, University of Opole, Poland
[2] Department of Family Medicine, Wroclaw Medical University, Poland

A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of the article

Advances in Clinical and Experimental Medicine, ISSN 1899–5276 (print), ISSN 2451–2680 (online) *Adv Clin Exp Med*. 2023

Address for correspondence
Elżbieta Szlenk-Czyczerska
E-mail: ela6035@onet.pl

Funding sources
None declared

Conflict of interest
None declared

Received on December 8, 2022
Reviewed on February 1, 2023
Accepted on February 20, 2023

Published online on March 15, 2023

Abstract

Background. Patients with cardiovascular disease (CVD) have an increased need for medical care and a high risk of hospitalization. It is necessary to improve the integration between healthcare, long-term care and social care for these individuals, as poor integration limits the full potential of care.

Objectives. This study aims to identify effective indicators of CVD management, including variables that promote the horizontal and vertical integration of planned interventions.

Materials and methods. Patients with chronic CVD managed by a general practitioner (GP) or a primary care cardiologist will be enrolled in the study. The study will use the World Health Organization Quality of Life Questionnaire (WHOQOL)-BREF, the Health Behavior Inventory (HBI) questionnaire, the Camberwell Assessment of Need (CAN) Short Appraisal Schedule, the Hospital Anxiety and Depression Scale-Modified Version (HADS-M), a Self-Description Questionnaire, and the authors' self-prepared questionnaire to collect data.

Results. The main results will allow for the identification of the variables that influence the effectiveness of healthcare (understood as the synergy of high quality of life, intensification of health behaviors and high satisfaction of needs) for patients with CVD. In addition, an examination of the relationships between quality of life and health behaviors, assessment of needs (health and social), level of religiosity and spirituality, expectations, and variables affecting anxiety and depressive symptoms will allow for the identification of indicators that favor the integration of care both horizontally and vertically.

Conclusions. The results of this study will support the development of systems aimed at identifying CVD patients at risk for lower effectiveness of care in integrated care. In addition, the results may help to develop clinical information and decision support systems aimed at designing personalized care models for patients with CVD. They may also help to develop coordinated care plans and patient education programs, and obtain data useful for implementing system changes.

Key words: patients, cardiovascular disease, primary healthcare, integrated care

Cite as
Szlenk-Czyczerska E, Kurpas D. Indicators of integrated care for patients with chronic cardiovascular disease in ambulatory care [published online as ahead of print on March 15, 2023]. *Adv Clin Exp Med*. 2023. doi:10.17219/acem/161462

DOI
10.17219/acem/161462

Introduction

Research has identified poor coordination between healthcare, long-term care and social care, and has shown that such a weak integration limits the full capacity of patient care.[1] With a paradigm change in service delivery, healthcare systems will be more consistent and potentially even more financially efficient and cost-effective. As a result, the integration of various health services is increasingly seen to provide more coordinated care and stem the rapid cost inflation that the treatment sector is causing.[2,3]

It has been pointed out that healthcare systems should be more people-centered and able to provide integrated, high-quality care.[4,5] Interventions to ensure coordination and continuity of care when people move from one place to another or from one level of care to another in the same location are advisable for particular patient groups, such as the elderly.[3,6]

The growing emphasis on population health and chronic disease management requires the intervention of many providers within a continuum of care.[5] Horizontal and vertical integration is the answer to this challenge. Horizontal integration relates to tactics that combine similar levels of care and address the provision of varied complementary health services to meet the diverse health needs of patients. Vertical integration, on the other hand, refers to strategies that combine different levels of care (from primary care clinics to general tertiary hospitals).[5,3] The call for integrated care has already been taken up in many countries, resulting in several experimental programs and innovations in health policy.[3,5,7–11]

Undoubtedly, patients with cardiovascular disease (CVD) have a high risk of hospitalization and an elevated need for medical care.[12] As a result, they often require multiple contacts with different healthcare providers, increasing the likelihood of receiving poor and fragmented care.[4] Given the expected incidence of CVD and demographic changes, a more effective and targeted model of care for patients with chronic CVD needs to be developed.[2,12–15] In addition, the Polish healthcare system is characterized by fragmented healthcare administration (which significantly complicates coordination at the systemic level) and relatively low healthcare spending.[16] These features make it necessary to study the requirements, practices and challenges of integrating care for people with CVD in the country. Improving the integration of CVD care will effectively impact patient functioning, and reduce maintenance costs and needless hospitalizations.[12]

It should be noted that, in recent years, there has been a return to the promotion of holistic care, defined as a caring approach that is more concerned about the patient and takes into account all of their needs, goals and values.[12–15] In addition, available research emphasizes that integration of care should focus on a comprehensive approach to care and multidisciplinary collaboration.[3,17] There is also evidence that the social dimension needs to be integrated into health service delivery to meet the population health needs. Community support and interpersonal ties are key to health and wellbeing.[3]

Cardiovascular disease is known to negatively affect mental and physical health, social components of life activities, and emotional state. All of the above consequences associated with CVD can be measured and detected by assessing patients' quality of life indicators.[15,18] Significantly, assessing the quality of life affects the efficiency of medical treatment and makes therapeutic options more accessible and acceptable to patients. Quality of life is also perceived as an indicator of the effectiveness of current political and social support systems.[15,18–21] A correlation between the quality of life in patients with CVD and point of healthcare has been demonstrated.[15]

Another critical topic is the health-promoting behaviors of CVD patients. Lifestyle, including health-promoting behaviors, is an important determinant of health.[22] Unhealthy behaviors lead to, for example, an increased incidence of heart failure, poorer survival rates, an aging population, and an obesity epidemic.[23,24] Health behaviors are considered a key element in the prevention of CVD. Notably, lower levels of health-promoting behaviors have been shown to increase the risk of anxiety disorders in patients with CVD.[14] Health-promoting behaviors also delay patient disability and thus the need for social support.[25,26] Data analyses have shown that older people with healthier lifestyles can expect to spend about 1.7 years less with disability at the end of their lives compared to their peers with unhealthy lifestyles.[27] The possibility of delaying death by fostering health-promoting behaviors has also been demonstrated.[27–29] Health behavior assessment of patients with CVD is a significant indicator of health care effectiveness.[14] The cost-effectiveness of encouraging health-promoting behaviors has also been confirmed. For example, behavioral change has been shown to reduce both direct and indirect medical costs.[30,31] It has also been noted that health-promoting behaviors should be fostered, particularly at the primary care level. Identifying risk factors for CVD and education about these factors should be a regular part of primary care visits.[12,32,33]

However, the issue of health still needs to be addressed in primary health care (PHC) analyses of the CVD delivery system. Health needs are seen as the product of a specific clinical condition, resulting in health behaviors, quality of life and the evaluation of health services. The PHC design is premised on identifying patients' individual biopsychosocial needs. This also facilitates the determination of further clinical management and patient care.[34] It is considered that identifying a need is equivalent to specifying a problem and allows for appropriate intervention.[34,35] It has also been stressed that the identification of needs, especially unmet needs, is essential, as they are related to health conditions and, thus, to quality of life and medical costs. The identification of needs is an explanatory

variable that has a greater impact on quality of life than clinical or sociodemographic factors and, in addition, is indirectly related to the level of quality of care. It has also been found that, when comparing patients' and health professionals' assessments of needs, patients' estimates are more accurate, and the extent of unmet needs remains related to patients' level of functioning.[35]

Spiritual beliefs and religious practices affect coping mechanisms for various chronic diseases, including CVD.[36–39] For many CVD patients, religious practices and beliefs are highly personal and noteworthy features of their disease, and provide critical management strategies.[40] Cardiovascular disease impairs mobility and limits social activities and work, thus becoming a cause of isolation for patients. The condition can lead to chronic anxiety and a depressed mood, resulting in the development or exacerbation of anxiety-depression syndrome. As mental state significantly affects prognosis and treatment, the necessity for better detection tactics is becoming more recognized. Mental disorders should be treated accordingly and detected earlier.[14] In addition, a PHC efficacy study indicates that future research should also consider the relationships between spirituality and religiosity, quality of life, and anxiety and depression in patients with CVD.[12]

In sum, the basis of person-centered care is a holistic understanding of an individual's health and wellbeing, the ability and capacity to care for themselves, and their needs, preferences and environment.[41] It has also been noted that self-care should be tailored to a person's baseline condition.[12] In addition, the patient's motivation and knowledge are essential for effective self-management.[42] Therefore, when it comes to the need for care integration, it is essential that healthcare providers have a holistic understanding of the frail patient in order to individually assess self-care options and provide support and encouragement as needed.[6,12] In addition, some studies suggest that the disappointing results observed in many existing integration models are often due to an inadequate assessment of patients' needs and preferences,[6] and an underestimation of community-based care.[6]

Regarding the integrated care of CVD patients, there is still little research on this topic.[12–15] There are some studies, but they focus on clinically homogeneous populations.[40,43,44] The central role of PHC is evident in almost all integration models studied so far.[3] Given the role that PHC plays in improving the healthcare system, it is essential to identify indicators that can be used to assess the process maturity of integrated CVD care.

Objectives

In light of these considerations, this study aims to identify effective indicators of healthcare delivery in patients with CVD, including variables that promote the horizontal and vertical integration of planned interventions.

Materials and methods

Study design and setting

This observational and cross-sectional project will be conducted with the approval of the University of Opole Research Ethics Committee and will be carried out in accordance with the requirements of the 1975 Declaration of Helsinki (as amended in 2000). The project will be performed among Polish patients with CVD in Opole (Poland) who are receiving outpatient care. The PHC physicians and cardiologists will follow these patients to determine specific indicators of integrated care.

Participants

An invitation to participate will be sent to the chief executive officer (CEO) of the company which comprises the 4 municipal primary care clinics. Patients will be selected by general practitioners (GPs)/cardiologists in accordance with the inclusion criteria. Chronic CVD will be defined on the basis of primary medical history (diagnosis by the GP). Patients with CVD under the care of a GP (group A) and, to identify variables specific to ambulatory care, patients with CVD under the supervision of a cardiologist (group B) will be invited to participate. They will be encouraged to take part in the study by their GP/cardiologist during scheduled PHC visits. The doctor will interview the patient to outline the aim and methods of the study and to obtain preliminary verbal consent. Patients will receive a set of questionnaires and an informed consent form to participate in the study. The inclusion criteria are being over 18 years of age, a diagnosis of CVD (International Classification of Diseases 10th Revision (ICD-10) codes) at least 1 year before the start of the study, and receiving care from a GP/cardiologist at a primary care center. The criteria for exclusion are cognitive disorders and other severe mental illnesses and/or other difficulties that prevent active participation. Participation in the study will be voluntary and anonymous. Before taking part in the study, each patient will be informed of the purpose, methods and the possibility of withdrawal at any stage of the study. As mentioned above, the purpose and procedures will be explained at the selection stage, and only those who voluntarily consent will be accepted. Candidates will complete the questionnaire in person (paper-and-pencil method) at the PHC.

Variables and data collection

WHOQOL-BREF

Numerous studies have shown that the assessment of the quality of life is as important as physical, laboratory or clinical findings in the CVD patient population.[15] Although current treatment strategies for patients with CVD

aim to reduce morbidity and prolong survival, integrated treatment should also focus on improving the patient's quality of life by reducing symptoms, optimizing daily living and improving overall wellbeing.[15]

With this in mind, the current study will assess variables related to the quality of life in people with CVD using a short version of the World Health Organization Quality of Life Questionnaire (WHOQOL).[45] Aspects of quality of life assessed through this questionnaire include physical status (mobility and independence), emotional status (depressive symptoms, anxiety, anger, mood swings, feelings of shame, helplessness, and future expectations), social relationships (social, sexual and family activities, marital satisfaction), economic status (income and employment), intellectual abilities (memory, ability to concentrate, ability to learn), and a self-assessment of health status (self-assessment of the severity of symptoms and degree of disability).[46,47] This questionnaire assesses the quality of life of people with CVD in 4 main domains: physical health, psychological health, social relationships, and environment. The test also includes scored questions on individual perception of quality of life (question 1) and health status (question 2). Responses are recorded on a 5-point Likert scale. The reliability of the Polish version of WHOQOL-BREF was checked using the Cronbach's α coefficient, which was 0.81 for physicality, 0.78 for psychology, 0.69 for social relationships, and 0.77 for the environment. The internal consistency for the whole questionnaire was 0.90.[46,47]

Health Behavior Inventory questionnaire

Another critical issue is the health-promoting behaviors of CVD patients, which are considered an essential component of CVD prevention.[14] Assessing the degree of health-promoting behaviors allows for the identification of CVD patients who may need stimulation of these behaviors. With this in mind, we will assess the overall level of health-promoting behaviors and 4 categories of these behaviors in people with CVD, including proper eating habits, preventive measures and appropriate health attitude practices. The measurement of proper eating habits will involve an assessment of the types of foods consumed (e.g., whole grain breads, vegetables and fruits). Statements describing preventative behaviors will refer to following health recommendations and obtaining information about health and disease. Assessed healthy habits will include physical activity, and daily sleep and rest habits. The positive mental attitude category will assess the extent of avoidance of excessive emotions, tension and stress, depressing situations, and positive perceptions.[48]

The Juczyński Health Behavior Inventory (HBI) questionnaire will be used to assess the level of health-seeking behaviors in CVD patients. This questionnaire consists of 24 statements that consider the categories outlined above. Respondents rate each statement on a scale from 1 to 5, where 1 represents almost never, 2 represents rarely, 3 represents sometimes, 4 represents often, and 5 represents most often/almost always. The scores are then added to calculate the overall intensity of health activities, ranging from 24 to 120 points. The higher the score, the higher the intensity of health-promoting behaviors. In addition, the intensity of each category is assessed separately.[48]

Camberwell Assessment of Need Short Appraisal Schedule

The poor performance of many existing integration models may be due to a lack of or inadequate assessment of patient needs and preferences.[6] Therefore, the modified Camberwell Assessment of Need (CAN), which focuses on 22 problem areas (Table 1) and can be used with chronically ill patients, will be utilized for this study.[35] A comprehensive identification of needs allows integrated care to identify the problem and take appropriate action to eliminate or reduce the need, including in the social dimension.[15]

Table 1. CAN problem areas[40]

CAN problem areas
1. Housing conditions
2. Ability to prepare meals and do the shopping themselves
3. Ability to take care of the home
4. Self-care – ability to maintain hygiene
5. Daily activities
6. Physical health
7. Mental health
8. Health information and treatment
9. Psychological stress
10. Drinking alcohol and related problems (health, work, family)
11. Drug use
12. Taking medication not recommended by a doctor
13. Social contacts
14. Need for intimate relationships
15. Satisfaction with intimate relationships
16. Satisfaction with sex life
17. Need for children
18. Satisfaction with relationships with children
19. Ability to communicate by telephone
20. Ability to use public transport
21. Ability to manage own money
22. Receiving all money due (benefits)

CAN – Camberwell Assessment of Need.

For the current study, the Camberwell Needs Index will be calculated. This calculation involves determining the number (N) of satisfied (1) and unmet (0) needs of the patient based on 24 questions. In turn, the number (M) of satisfied needs (1) is determined within the number (N) of needs indicated by the respondent. The M/N formula is used to calculate the Camberwell Index. The above method also allows for a calculation of the Camberwell Index for unmet needs according to the formula: 1 – M/N. The consistency of the modified version of the CAN questionnaire was 0.82 (Cronbach's α).[35]

Hospital Anxiety and Depression Scale-Modified Version

Studies have shown that the prevalence of anxiety disorders and depression in patients with CVD is twice as high as in the general population and leads to a worse medical prognosis for these patients. Moreover, anxiety and depression symptoms reduce the motivation to change one's lifestyle and seek social interaction, and can cause patients to even psychologically disengage from central problems. Therefore, anxiety and depressive disorders should be recognized as early as possible and treated accordingly. Patients with anxiety and depression without social support whose symptoms do not progress may have an unfavorable attitude toward the disease and a sense of helplessness.[14]

Given this, in the context of examining integrated care in the outpatient setting, it is crucial to carefully determine the epidemiology of anxiety and depressive disorders and their risk factors in patients with CVD. A modified version of the Hospital Anxiety and Depression Scale (HADS) questionnaire, the HADS-M, will be used to assess anxiety and depression. This instrument uses 7 items to measure anxiety, 7 items to evaluate the level of depression and 2 items to measure nervousness and aggression. The questionnaire is helpful in assessing anxiety, depression and aggression in both inpatients and outpatients. It contains 16 test questions scored from 0 to 3. The test score is the sum of all scores in each category. The maximum score for anxiety and depression is 21 and for aggression it is 6. The subscales for anxiety and depression are interpreted as follows: scores of 0–7 correspond to normal behavior, 8–10 are borderline and indicate mild anxiety, and 11–21 are pathological and indicate an anxiety syndrome/disorder. Validation studies of the original and modified versions of the HADS scale demonstrate its reliability and accuracy.[49,50]

Self-Description Questionnaire

Studies have shown that higher levels of religiosity and spirituality may be associated with a better quality of life in CVD patients.[36] Moreover, further research in this area is suggested.[12] With this in mind, we decided to investigate this aspect and use it in the context of integrated care. The instrument used to examine the level of spirituality in CVD patients is the Self-Description Questionnaire by Heszen-Niejodek, Gruszczyńska and Metlak. It consists of 20 statements that the respondent is asked to rate on a 5-point scale. The instrument contains 3 subscales with a Cronbach's α between 0.90 and 0.81: religiosity – 7 statements, ethical sensitivity – 7 statements, and harmony – 6 statements. The reliability of the questionnaire, differentiated by gender, age and education was 0.88 for the total index, 0.94 for religious attitudes, 0.77 for ethical sensitivity, and 0.80 for harmony. The results are obtained by summing the scale choices within each factor and, finally, the total index of spirituality is obtained from the sum of the sub-factors.[51]

Authors' self-prepared questionnaire

A self-prepared interview questionnaire will also be used to collect data on relevant sociodemographic characteristics (gender, age, marital status, educational level, financial circumstances, place of residence) and the number and type of healthcare services provided (number of hospitalizations in the last 3 years, number of visits to GP and cardiology clinic in the last 12 months, among others).

Statistical analyses

For quantitative variables, the arithmetic mean, standard deviation, 1st quartile (Q.25%), median (Q.50%), 3rd quartile (Q.75%), minimum, and maximum will be calculated. For nominal variables, the frequency (i.e., percentage) will be determined. The normality of the distribution of the variables will be checked using the Shapiro–Wilk test. For numerical variables with a normal distribution, the Student's t-test and Pearson's correlation will be used. For numerical variables that deviate from a normal distribution, the Wilcoxon test and Spearman's rank correlation will be used. Relationships between categorical variables will be analyzed using the χ^2 test or Fisher's exact test (when the subclass size is small). An α value of $p \leq 0.05$ will be considered statistically significant.

Analysis of the obtained results

The main results obtained in this study will relate to indicators of healthcare effectiveness, namely the quality of life, health behaviors, and health and social needs. To identify variables specific to health behaviors, ambulatory care, quality of life, and needs assessment will be compared between CVD patients under the supervision of a GP (group A) and those under the care of a cardiologist (group B).

Several additional analyses will be included to flesh out indicators favoring integration of care (both horizontally and vertically), including whether there is an association between CVD patients' health-related quality of life and their health behaviors, needs, levels of religiosity and spirituality, expectations, and whether there are variables affecting anxiety and depressive symptoms in this patient group. Groups A and B will be compared with each other in regard to the number of GP visits and cardiology outpatient clinic visits over the past year. Additional tests will include any relevant variables, such as, for example, comorbidities and length of hospitalization for CVD in the previous 12 months.

Based on data on higher levels of healthcare effectiveness (understood as a synergy of high quality of life, intensification of health behaviors and high levels of needs met), we will select a group of patients from those who we believe will most likely experience poorer healthcare

effectiveness. The analysis of the results will allow us to isolate the variables that determine the greatest extent of the improvement of healthcare efficiency in people with CVD, including variables that favor the horizontal and vertical integration of the planned interventions. The results obtained in this study will also be compared with those obtained in earlier studies on healthcare effectiveness in CVD patients.[12–15]

Advantages and limitations of the study

The strength of this study is that it will undoubtedly be the first to identify indicators of healthcare effectiveness favoring the horizontal and vertical integration of planned interventions in Polish CVD patients. Furthermore, the obtained results can be used in the future, allowing for the monitoring of changes regarding the efficiency of care within integrated care (nationally and internationally). The study will also have the advantage of being conducted in different groups (patients under the supervision of a GP and patients under the care of a cardiologist), increasing the study's reliability and objectivity. A limitation of the study is that the sample size is relatively small and the number of centers from which patients will be drawn is too few. In the future, it is recommended to conduct a similar study with a greater number of patients at a larger number of centers and to compare the results obtained in Poland with those obtained at foreign research centers.

Clinical implications

The fragmentation of healthcare services poses a significant challenge to implementing comprehensive, coordinated and continuous care.[3] This is especially important for the growing population of people with CVD, who typically have complex medical and non-medical needs. The results of our study may help overcome the barriers created by the roles and characteristics of primary and specialty healthcare, so that all providers can collaborate to provide seamless services for CVD patients. In addition, it has been suggested that taking a holistic approach is essential for integrated care.[3,6,17] The results of the present study can provide valuable information about the holistic health picture of patients with CVD. In addition, care teams and coordinators can use the findings to develop systems aimed at identifying groups at risk for lower effectiveness of care in integrated care system (both vertically and horizontally), because there is evidence that intensive follow-up, the involvement of informal caregivers and shared decision-making increase the success of transitional care in particular patient populations, such as the elderly.[52] The results of our study may also be useful in developing transitional care systems for patients with CVD. In addition, our results can be used to create online databases containing all documented patient information to support professional communication and the care process.

The results of the present study can be a valuable source of data that can be used to focus on the full spectrum of healthcare services for people with CVD, including prevention, treatment, promotion, and rehabilitation. In addition, they may be helpful in developing coordinated care plans, creating patient education programs and developing strategies to help implement systemic changes in order to recognize individuals and support families who care for patients with CVD.

Because integrated care services should be monitored, regularly evaluated and improved,[6] the results of our study may help create clinical information and decision support systems for designing personalized care models for patients with CVD. Moreover, the obtained results can provide information for the development of tools to assess the quality of care in CVD patients by analyzing their psychological, somatic, environmental, and social needs and expectations.

ORCID iDs

Elżbieta Szlenk-Czyczerska https://orcid.org/0000-0002-8145-6768
Donata Kurpas https://orcid.org/0000-0002-6996-8920

References

1. Organisation for Economic Co-operation and Development (OECD). *Realising the Potential of Primary Health Care*. Paris, France: Organisation for Economic Co-operation and Development (OECD); 2020. doi:10.1787/a92adee4-en
2. Kurpas D. Challenges in implementing integrated care in Central and Eastern Europe: Experience of Poland. *Int J Integr Care*. 2020;20(2):7. doi:10.5334/ijic.5533
3. He AJ, Tang VFY. Integration of health services for the elderly in Asia: A scoping review of Hong Kong, Singapore, Malaysia, Indonesia. *Health Policy*. 2021;125(3):351–362. doi:10.1016/j.healthpol.2020.12.020
4. Barrenho E, Haywood P, Kendir C, Klazinga N. *International Comparisons of the Quality and Outcomes of Integrated Care: Findings of the OECD Pilot on Stroke and Chronic Heart Failure*. Vol 142. Paris, France: Organisation for Economic Co-operation and Development (OECD); 2022. doi:10.1787/480cf8a0-en
5. Heeringa J, Mutti A, Furukawa MF, Lechner A, Maurer KA, Rich E. Horizontal and vertical integration of health care providers: A framework for understanding various provider organizational structures. *Int J Integr Care*. 2020;20(1):2. doi:10.5334/ijic.4635
6. Leithaus M, Beaulen A, De Vries E, et al. Integrated care components in transitional care models from hospital to home for frail older adults: A systematic review. *Int J Integr Care*. 2022;22(2):28. doi:10.5334/ijic.6447
7. Glendinning C. Breaking down barriers: Integrating health and care services for older people in England. *Health Policy*. 2003;65(2):139–151. doi:10.1016/S0168-8510(02)00205-1
8. Nolte E, Knai C, Hofmarcher M, et al. Overcoming fragmentation in health care: Chronic care in Austria, Germany and the Netherlands. *Health Econ Policy Law*. 2012;7(1):125–146. doi:10.1017/S1744133111000338
9. Somme D, de Stampa M. Ten years of integrated care for the older in France. *Int J Integr Care*. 2011;11(Special 10th Anniversary Edition): e141. doi:10.5334/ijic.668
10. Hébert R, Dubois MF, Raïche M, Dubuc N. The effectiveness of the PRISMA integrated service delivery network: Preliminary report on methods and baseline data. *Int J Integr Care*. 2008;8:e03. doi:10.5334/ijic.229
11. Kodner DL, Kyriacou CK. Fully integrated care for frail elderly: Two American models. *Int J Integr Care*. 2000;1:e08. doi:10.5334/ijic.11

12. Szlenk-Czyczerska E, Guzek M, Bielska DE, Ławnik A, Polański P, Kurpas D. Variables determining higher home care effectiveness in patients with chronic cardiovascular disease. *Int J Environ Res Public Health*. 2022;19(9):5170. doi:10.3390/ijerph19095170
13. Szlenk-Czyczerska E, Guzek M, Bielska DE, Ławnik A, Polański P, Kurpas D. Needs, aggravation, and degree of burnout in informal caregivers of patients with chronic cardiovascular disease. *Int J Environ Res Public Health*. 2020;17(17):6427. doi:10.3390/ijerph17176427
14. Szlenk-Czyczerska E, Guzek M, Bielska DE, Ławnik A, Polański P, Kurpas D. Factors differentiating rural and urban population in determining anxiety and depression in patients with chronic cardiovascular disease: A pilot study. *Int J Environ Res Public Health*. 2021;18(6):3231. doi:10.3390/ijerph18063231
15. Szlenk-Czyczerska E, Guzek M, Bielska DE, Ławnik A, Polański P, Kurpas D. The analysis of the relationship between the quality of life level and expectations of patients with cardiovascular diseases under the home care of primary care nurses. *Int J Environ Res Public Health*. 2022;19(6):3300. doi:10.3390/ijerph19063300
16. Organisation for Economic Co-operation and Development (OECD), European Observatory on Health Systems and Policies. *Polska: Profil systemu ochrony zdrowia 2021*. Paris, France: Organisation for Economic Co-operation and Development (OECD); 2022. doi:10.1787/b562ffe2-pl
17. Leijten FRM, Struckmann V, van Ginneken E, et al. The SELFIE framework for integrated care for multi-morbidity: Development and description. *Health Policy*. 2018;122(1):12–22. doi:10.1016/j.healthpol.2017.06.002
18. Kalininskaya A, Lazarev A, Abebo T, Kizeev M, Rassoha D. The medical social characteristics and evaluation of life quality of patients with diseases of blood circulation system [in Russian]. *Probl Sotsialnoi Gig Zdravookhranenniiai Istor Med*. 2021;29(3):456–461. doi:10.32687/0869-866X-2021-29-3-456-461
19. Szyguła-Jurkiewicz B, Kowalska M, Mościński M. Jakość życia jako element stanu zdrowia i zdrowia leczenia chorych ze schorzeniami układu sercowo-naczyniowego. *Fol Kardiol Fragment*. 2011;6(1):62–71. https://journals.viamedica.pl/folia_cardiologica/article/view/23617/18803. Accessed October 12, 2022.
20. Wnuk M, Marcinkowski J. Quality of life in chronic diseases [in Polish]. *Hygeia Publ Health*. 2013;48(3):274–278. http://www.h-ph.pl/pdf/hyg-2013/hyg-2013-3-274.pdf. Accessed October 12, 2022.
21. Cieślik B. Influence of the heart diseases on quality of life: Literature review [in Polish]. *Inż Biomed*. 2014;20(2):101–118. http://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-5dfaac5d-4bd2-4c59-adbb-96158c099aa2?q=bwmeta1.element.baztech-1bef df11-d585-4643-8b04-67d25eea73f4;3&qt=CHILDREN-STATELESS. Accessed October 12, 2022.
22. Szlenk-Czyczerska E, Semla W, Jenczura A. Assessment of health behaviors of patients with heart failure treated in a cardiology department. *Health Prob Civil*. 2021;15(2):79–86. doi:10.5114/hpc.2021.104625
23. Arora S, Patel P, Lahewala S, et al. Etiologies, trends, and predictors of 30-day readmission in patients with heart failure. *Am J Cardiol*. 2017;119(5):760–769. doi:10.1016/j.amjcard.2016.11.022
24. Chamberlain AM, Dunlay SM, Gerber Y, et al. Burden and timing of hospitalizations in heart failure: A community study. *Mayo Clin Proc*. 2017;92(2):184–192. doi:10.1016/j.mayocp.2016.11.009
25. Liao WC, Li CR, Lin YC, et al. Healthy behaviors and onset of functional disability in older adults: Results of a national longitudinal study. *J Am Geriatr Soc*. 2011;59(2):200–206. doi:10.1111/j.1532-5415.2010.03272.x
26. Artaud F, Dugravot A, Sabia S, Singh-Manoux A, Tzourio C, Elbaz A. Unhealthy behaviours and disability in older adults: Three-City Dijon cohort study. *BMJ*. 2013;347:f4240. doi:10.1136/bmj.f4240
27. Jacob ME, Yee LM, Diehr PH, et al. Can a healthy lifestyle compress the disabled period in older adults? *J Am Geriatr Soc*. 2016;64(10):1952–1961. doi:10.1111/jgs.14314
28. Shaw BA, Agahi N. A prospective cohort study of health behavior profiles after age 50 and mortality risk. *BMC Public Health*. 2012;12(1):803. doi:10.1186/1471-2458-12-803
29. Abbasi J. As walking movement grows, neighborhood walkability gains attention. *JAMA*. 2016;316(4):382–383. doi:10.1001/jama.2016.7755
30. Eriksson MK, Hagberg L, Lindholm L, Malmgren-Olsson EB, Österlind J, Eliasson M. Quality of life and cost-effectiveness of a 3-year trial of lifestyle intervention in primary health care. *Arch Intern Med*. 2010;170(16):1470–1479. doi:10.1001/archinternmed.2010.301
31. Saha S, Carlsson KS, Gerdtham UG, et al. Are lifestyle interventions in primary care cost-effective? An analysis based on a Markov model, differences-in-differences approach and the Swedish Björknäs Study. *PLoS One*. 2013;8(11):e80672. doi:10.1371/journal.pone.0080672
32. Fernald DH, Dickinson LM, Froshaug DB, et al. Improving multiple health risk behaviors in primary care: Lessons from the Prescription for Health COmmon Measures, Better Outcomes (COMBO) Study. *J Am Board Fam Med*. 2012;25(5):701–711. doi:10.3122/jabfm.2012.03.110057
33. Lewis KH, Gillman MW, Greaney ML, Puleo E, Bennett GG, Emmons KM. Relationships between social resources and healthful behaviors across the age spectrum. *J Aging Res*. 2012;2012:501072. doi:10.1155/2012/501072
34. Mazurek J, Rymaszewska J. Needs assessment of elderly patients based on the Camberwell Assessment of Need for the Elderly: Literature review [in Polish]. *Gerontol Pol*. 2012;20(1):1–7. https://gerontologia.org.pl/wp-content/uploads/2016/05/2012-01-1.pdf. Accessed October 15, 2022.
35. Kurpas D. *Paradygmat opieki nad chorymi przewlekle w ramach podstawowej opieki zdrowotnej*. Wrocław, Poland: Wroclaw Medical University; 2013. https://ppm.umed.wroc.pl/docstore/download/@UMW5de4d88174d34218a13ad443744c5db8/Kurpas%20Donata-wcag.pdf. Accessed October 15, 2022.
36. Abu HO, Ulbricht C, Ding E, et al. Association of religiosity and spirituality with quality of life in patients with cardiovascular disease: A systematic review. *Qual Life Res*. 2018;27(11):2777–2797. doi:10.1007/s11136-018-1906-4
37. van Groenestijn AC, Kruitwagen-van Reenen ET, Visser-Meily JMA, van den Berg LH, Schröder CD. Associations between psychological factors and health-related quality of life and global quality of life in patients with ALS: A systematic review. *Health Qual Life Outcomes*. 2016;14:107. doi:10.1186/s12955-016-0507-6
38. Yamout B, Issa Z, Herlopian A, et al. Predictors of quality of life among multiple sclerosis patients: A comprehensive analysis. *Eur J Neurol*. 2013;20(5):756–764. doi:10.1111/ene.12046
39. Paiva CE, Paiva BSR, de Castro RA, et al. A pilot study addressing the impact of religious practice on quality of life of breast cancer patients during chemotherapy. *J Relig Health*. 2013;52(1):184–193. doi:10.1007/s10943-011-9468-6
40. Gok Ugur H. The effect of home care for stroke patients and education of caregivers on the caregiver burden and quality of life. *Acta Clin Croat*. 2019;58(2):321–332. doi:10.20471/acc.2019.58.02.16
41. Leijten FRM, Struckmann V, van Ginneken E, et al. The SELFIE framework for integrated care for multi-morbidity: Development and description. *Health Policy*. 2018;122(1):12–22. doi:10.1016/j.healthpol.2017.06.002
42. Huckfeldt PJ, Reyes B, Engstrom G, et al. Evaluation of a multicomponent care transitions program for high-risk hospitalized older adults. *J Am Geriatr Soc*. 2019;67(12):2634–2642. doi:10.1111/jgs.16189
43. Sevilla-Cazes J, Ahmad FS, Bowles KH, et al. Heart failure home management challenges and reasons for readmission: A qualitative study to understand the patient's perspective. *J Gen Intern Med*. 2018;33(10):1700–1707. doi:10.1007/s11606-018-4542-3
44. Lang CC, Smith K, Wingham J, et al. A randomised controlled trial of a facilitated home-based rehabilitation intervention in patients with heart failure with preserved ejection fraction and their caregivers: The REACH-HFpEF pilot study. *BMJ Open*. 2018;8(4):e019649. doi:10.1136/bmjopen-2017-019649
45. World Health Organization (WHO). Tools and toolkits/WHOQOL/WHOQOL-BREF. https://www.who.int/tools/whoqol/whoqol-bref. Accessed October 18, 2022.
46. Wołowicka L, Jaracz K. Polska wersja WHOQOL 100 i WHOQOL BREF. In: Wołowicka L, ed. *Jakość życia w naukach medycznych*. Poznań, Poland: Dział Wydawnictw Uczelnianych Akademii Medycznej im. Karola Marcinkowskiego. ISBN:838873265X.
47. Jaracz K, Kalfoss M, Górna K, et al. Quality of life in Polish respondents: psychometric properties of the Polish WHOQOL – Bref. *Scand J Caring Sci*. 2006;20:251–260. doi:10.1111/j.1471-6712.2006.00401.x
48. Juczyński Z. *Narzędzia pomiaru w promocji i psychologii zdrowia*. 2nd ed. Warszawa, Poland: Pracownia Testów Psychologicznych; 2012. ISBN:9788360733431.

49. Stachowiak-Andrysiak M, Stelcer B, Mikstacki A, Kuliński D, Tamowicz B. Assessment of mental well-being of patients with chronic kidney disease (CKD) and their adaptation to stress caused by the disease [in Polish]. *Nowiny Lek*. 2012;81(6):636–640. https://jms.ump.edu.pl/uploads/2012/6/636_6_81_2012.pdf. Accessed November 15, 2022.
50. Kozera E. Zależność między akceptacją choroby a lękiem i depresją u pacjentek z nowotworem gruczołu piersiowego. *Współcz Pielęg Ochr Zdr*. 2015;4:85–88.
51. Heszen-Niejodek I, Gruszczyńska E. Spirituality as a human dimension, its importance in health psychology, and its measurement [in Polish]. *Przegl Psychol*. 2004;47(1):15–31. https://www.kul.pl/files/714/media/1.47.2004.art.1.pdf..pdf. Accessed November 16, 2022.
52. Shakib S, Dundon BK, Maddison J, et al. Effect of a multidisciplinary outpatient model of care on health outcomes in older patients with multimorbidity: A retrospective case control study. *PLoS One*. 2016;11(8):e0161382. doi:10.1371/journal.pone.0161382