Translation, Cross-Cultural Adaptation, and Psychometric Validation of the Russian Coronary Artery Disease Education Questionnaire II (CADE-Q II) in chronic coronary syndrome patients

Laskova A. I.[1,2], Ghisi G. L. M.[3], Lopatin Yu. M.[1,2]

Aim. This study sought to translate, cross-culturally adapt, and psychometrically validate the Coronary Artery Disease Education Questionnaire II (CADE-Q II) in Russian.

Material and methods. Independent translations and back-translations of the CADE-Q II were conducted by bilingual health professionals and certified translators, respectively. Experts met to consider cultural relevance of the items to Russian patients. The finalized version was then pilot tested in a group of patients to assess understanding and time to complete the tool. Following these steps, 303 patients with a diagnosis of stable coronary artery disease treated in the Outpatient Cardiology Department between April and November 2021 completed the CADE-Q II. The following psychometric properties were evaluated: confirmatory factor analysis, internal consistency (assessed by Cronbach's alpha), test-retest reliability (ICC), and criterion validity (assessed through the association with CADE-Q II and The Self Care of Coronary Heart Disease Inventory and SF-36 scores, among other characteristics from the participants including educational level).

Results. After items were translated, revised, culturally adapted and finalized, 30 patients took 30 minutes to complete the CADE-Q II during pilot test and questionnaire was considered understandable by all. Factor analysis (Kaiser-Meyer-Olkin =0.692 and Bartlett's criterion of Sphericity <0.05) revealed four factors, all internally consistent and aligned with the original version of the questionnaire. Cronbach's alpha of subscales ranged from 0.61 to 0.88 and ICC was 0.81. Criterion validity was confirmed by significant differences in total CADE-Q II scores by participants' educational level and correlations between CADE-Q II and The Self Care of Coronary Heart Disease Inventory scores (r=0.251, p<0.05).

Conclusion. The Russian CADE-Q II presented sufficient validity and reliability for use to assess disease-related knowledge of chronic coronary syndrome patients in Russia.

Keywords: chronic coronary syndromes, self-care, patient education as topic, psychometric validation, questionnaires and scales.

Relationships and Activities: none.

[1]Volgograd State Medical University, Volgograd, Russia; [2]Volgograd Regional Clinical Cardiology Center, Volgograd, Russia; [3]Cardiovascular Prevention and Rehabilitation Program, Toronto Rehabilitation Institute, University Health Network, Toronto, Canada.

Laskova A. I.* — post-graduate student of the Department of Cardiology, Cardiovascular and Thoracic Surgery of VolgGMU, cardiologist of the first cardiology department of the Volgograd Regional Clinical Cardiology Center, ORCID: 0000-0003-4322-8112, Ghisi G. L. M. — Pt PhD, Scientific Associate II, ORCID: 0000-0001-7946-3718, Lopatin Yu. M. — Doctor of Medical Sciences, Professor, Head of the Department of Cardiology, Cardiovascular and Thoracic Surgery, Institute of VolgGMU, head of the first cardiology department of the Volgograd Regional Clinical Cardiology Center, ORCID: 0000-0003-1943-1137.

*Corresponding author: kabargina.a.i@gmail.com

Перевод, кросс-культурная адаптация и валидация психометрических показателей русскоязычной версии опросника уровня знаний об ишемической болезни сердца CADE-Q II у пациентов с хроническими коронарными синдромами

Ласкова А. И.[1,2], Ghisi G. L. M.[3], Лопатин Ю. М.[1,2]

Цель. Выполнить перевод, кросс-культурную адаптацию и валидацию психометрических показателей русскоязычной версии опросника уровня знаний об ишемической болезни сердца (ИБС) The second version of "the Coronary Artery Disease Education Questionnaire" (CADE-Q II) у пациентов с хроническими коронарными синдромами (ХКС)

Материал и методы. Независимый и обратный переводы опросника CADE-Q II были выполнены двуязычными медицинскими работниками и сертифицированными переводчиками соответственно. Эксперты провели совещание по рассмотрению культурной значимости пунктов опросника для российских пациентов. Затем, окончательная версия была проверена на группе пациентов. Так, 303 пациента со стабильной ИБС, проходивших амбулаторное лечение в кардиологическом отделении в период с апреля по ноябрь 2021 года, были оценены с помощью CADE-Q II. Проводилась оценка следующих психометрических показателей: подтверждающий факторный анализ, внутренняя согласованность (оцененная с помощью коэффициента надёжности Кронбаха), ретестовая надёжность и критериальная валидность.

Результаты. После окончания перевода, редакции и культурной адаптации, 30 пациентам потребовалось 30 минут, чтобы заполнить CADE-Q II во время пилотного теста. Анкета была понятна всем участникам опроса. Факторный анализ (критерий Кайзера-Мейера-Олкина =0,692, критерий сферичности Бартлетта <0,05) выявил четыре фактора, все из которых внутренне непротиворечивы и соответствуют исходной версии опросника. Показатели коэффициента надёжности Кронбаха варьировались от 0,61 до 0,88, а ретестовая надежность составляла 0,81. Достоверность критерия была подтверждена значительными различиями в сумме баллов CADE-Q II в зависимости от уровня образования участников и корреляцией между баллами CADE-Q II и опросником способности к самопомощи The Self Care of Coronary Heart Disease Inventory (r=0,251, p<0,05).

Заключение. Русскоязычная версия CADE-Q II показала достаточную надёжность для оценки уровня знаний о заболеваниях у пациентов с ХКС в России.

Ключевые слова: хронические коронарные синдромы, самопомощь, обучение пациентов, психометрическая валидация, опросники и шкалы.

[1]Волгоградский государственный медицинский университет, Волгоград, Россия; [2]Волгоградский областной клинический кардиологический центр, Волгоград, Россия; [3]Программа сердечно-сосудистой профилактики и реабилитации, Институт реабилитации Торонто, Университетская сеть здравоохранения, Торонто, Канада.

Ласкова А. И.* ORCID: 0000-0003-4322-8112, Ghisi G. L. M. ORCID: 0000-0001-7946-3718, Лопатин Ю. М. ORCID: 0000-0003-1943-1137.

*Автор, ответственный за переписку (Corresponding author): kabargina.a.i@gmail.com

Cardiovascular diseases (CVDs) are the leading cause of death worldwide, with more than 16 million deaths per year. This number is estimated to increase to 23.6 million deaths by 2030 [1, 2]. Nevertheless, despite all the preventive measures taken by the state, CVDs also remain the leading cause of death in Russia [3]. Coronary artery disease (CAD) — the most common type of CVDs — is a chronic, progressive, and serious condition, with a dynamic nature conveniently categorized as either acute coronary syndromes or chronic coronary syndromes (CCS) [4].

Cardiac rehabilitation (CR) — a comprehensive out-patient chronic disease management program — can mitigate this burden [5]. Core components of these programs include physical activity, nutritional counseling, lifestyle modification, self-care skills improvement, risk factors controlling, psychosocial counseling, stress management and patient education [2, 6]. The benefits of CR are well established and include increasing their functional capacity, improving quality of life (QOL) [7, 8], reducing hospitalizations, morbidity and mortality [9]. Patient education plays an important part in these programs [10], as it can increase CCS patients' knowledge about their disease and thereby help them to make healthy decisions which can ultimately improve clinical outcomes [11]. Patient education is a life-changing process that is associated with patients' knowledge, healthy behaviors, and attitudes and skills that are necessary to maintain a good level of health[1].

According to the first Global CR survey [12], Russia has 3 CR programs and higher barriers to CR implementation and use, including lack of resources. Although the existing programs in Russia are quite successful in modifying the quality of life of patients with CVDs, there is a need for tools to help identify important outcomes that can guide healthcare providers on how to deliver all CR core components. Given this context and the importance of patients' education, there is a need for a Russian survey to assess patients' knowledge about their condition, which can guide CR programming. Although there are various tools to measure knowledge [13-16], none of them has been validated in Russia so far. Thus, this study sought to translate and cross-culturally adapt, and psychometrically validate the Coronary Artery Disease Education Questionnaire II (CADE-Q II) in Russian.

Material and methods

Design and Procedure. The was a cross-sectional study. Participants were recruited from Cardiology Department of a clinic in Volgograd, Russia between April and November 2021. Participants were informed about the objectives and methods of the study and those that agree to participate signed an informed consent. Participants then completed the questionnaire on site. This study was approved by the local Ethics Committee.

The CADE-Q II. CADE-Q II questionnaire [16] is used to assess the CAD patients' knowledge about their condition and related factors. The 31-item questionnaire is divided into five areas named medical condition, risk factors, exercise, nutrition and psychosocial risk. Each question has 4 possible answers and a corresponding score to each of them as follows: the "most correct" statement has a comprehensive and correct answer about the question, with a score of 3 points; the "partially correct" statement has a vague but correct answer about the question, with a score of 1 point; the "incorrect" statement has and incorrect answer about the question, with a score of 0 points; and, the "I don't know" statement is also available, with no points when selected. All scores are summed up leading to a final total score with can reach a maximum of 91. Higher score represent higher knowledge. When participants score higher than 68 (i.e. 75% of possible total scores) their knowledge is classified as "sufficient".

Translation and Cultural Adaptation. The translation and cross-cultural adaptation were performed by multiple steps in accordance with ISPOR guidelines [17] as follows: preparation, forward translation and reconciliation, back translation with further reviewing and harmonization, cognitive debriefing and further reviewing of cognitive debriefing results and finalization. In preparation, the original author of CADE-Q II was

---

[1] Lee MBK. Psycho-social support for patients with cardiovascular disease (CVD): barriers to a cardiac rehabilitation program (CRP). Canada: Simon Faraser University; 2016. http://summit.sfu.ca/item/16710 (05 May 2022).

Table 1

**Sociodemographic and clinical characteristics of respondents (n=303),
and mean and standard deviation of CADE-Q II scores by these characteristics**

	n (%)	CADE-Q II scores, mean±SD	p*
Sociodemographic Characteristics			
Sex			0.61
Male	180 (59.4%)	43.9±19.4	
Female	123 (40.6%)	45.9±13.5	
Education			0.007
Less than high school	8 (3.0%)	38.0±15.4	
High school	56 (18.0%)	34.2±16.0	
College certificate	127 (42.0%)	42.8±16.0	
Associate Degree	8 (3.0%)	62.5±24.7	
University	104 (34.0%)	52.0±16.2	
Marital Status			0.28
Married	199 (65.7%)	44.9±17.8	
Widowed	75 (24.7%)	41.3±16.4	
Divorced	29 (9.6%)	53.4±13.5	
Occupation			0.308
Retired	233 (77.0%)	45.7±15.2	
Unemployed	15 (5.0%)	26.5±14.1	
Construction worker	15 (5.0%)	46.3±28.1	
Non-construction worker	40 (13.0%)	42.7±24.4	
Disabled	30 (10.0%)	46.5±20.3	
Subjective assessment of family income			0.104
Extremely low	15 (5.0%)	37.8±14.5	
Low	157 (51.8%)	42.9±17.3	
Average	122 (40.2%)	45.9±16.3	
Above Average	5 (1.7%)	44.3±15.6	
High	4 (1.3%)	47.8±14.9	
Clinical Characteristics			
Type of CCS			0.019
1 (Patients with suspected CAD and "stable" angina symptoms)	115 (38%)	37.9±15.3	
2 (Patients with new onset of heart failure or left ventricular dysfunction and suspected CAD)	38 (12.5%)	51.0±16.3	
3 (Asymptomatic and symptomatic patients <1 year after an ACS or recent revascularization)	11 (3.6%)	60.1±11.8	
4 (Patients >1 year after initial angina diagnosis or revascularization)	83 (27.4%)	47.8±16.3	
5 (Patients with angina and suspected vasospastic or microvascular disease)	41 (13.5%)	65.5±17.6	
6 (Asymptomatic patients in whom CAD is detected at screening)	15 (5.0%)	44.7±17.2	
CCS class			0.741
1	22 (7.2%)	50.0±21.7	
2	233 (77.0%)	44.3±17.5	
3	48 (15.8%)	43.9±13.7	
Duration of angina history, years (mean±SD)	7.6±6.1	-	-
History of Myocardial Infarction			0.927
Yes	145 (47.9%)	44.9±18.0	
No	158 (52.1%)	44.6±16.7	
History of PCI			0.575
Yes	84 (27.7%)	46.5±18.7	
No	219 (72.3%)	44.0±16.7	
History of CABG			0.673
Yes	38 (12.5%)	46.9±20.5	
No	265 (87.5%)	44.4±16.8	
Atrial fibrillation			0.863
No	214 (70.6%)	45.1±17.8	
Persistent	36 (11.9%)	45.8±14.2	
Paroxysmal	53 (17.5%)	42.5±17.4	

Note: type of CCS — classifications in accordance with reference [4]. CCS class — classifications in accordance with [4]. * — value of differences between CADE-Q II scores by characteristics.

Abbreviations: ACS — acute coronary syndrome, CABG — coronary artery bypass graft surgery, CAD — coronary artery disease, CCS — chronic coronary syndrome, PCI — percutaneous coronary intervention, SD — standard deviation.

contacted and requested permission for this study. Ethics approval was also obtained. The initial translation from English to Russian was then performed by two doctors independently, both fluent in English and Russian. The resulting two versions of the translation were collectively reviewed and combined into one adapted Russian version. This version was then back translated to English by two professional translators independently. Both were not familiar with the original questionnaire and the objectives of this study. The back translations were again reviewed and combined into a second version. This version was then pilot tested in a group of 30 patients. Time of completion and understanding (via interview). After reviewing results, a final version was then ready for the next step: psychometric validation.

Psychometric Validation. The finalized version was completed by a group of CCS patients attending regular examinations in an Outpatient Cardiology Department to assess psychometric properties. After 1 month of the first completion, all participants have completed the questionnaire again to assess test-retest reliability. Only those that could write and read in Russian were included in the study.

Measures. Sociodemographic (i.e. marital status, educational level, occupation, subjective assessment of family income) and clinical characteristics (diagnosis) were assessed as part of the study. Participants completed the CADE-Q II twice in addition to other questionnaires as part of the validity assessment: the short Form-36 (SF-36) [18] and the Seattle Stable Angina Questionnaire (SAQ) for quality of life [19], the Self-Care of coronary heart disease Inventory (SC-CHDI) for self-care skills [20], and the Hospital Anxiety and Depression Scale (HADS) for anxiety and depression [21].

Data Analysis. Statistical data processing was carried out using IBM SPSS Statistics 23.0 for Windows (SPSS Inc., Chicago, IL, USA), except for confirmatory factor analysis, which was performed using the IBM SPSS Amos 23.0.0 program. The level of significance for all tests was 0.05. Descriptive statistics was used for participant characteristics and scores of all questionnaires.

For the psychometric validation, first factor analysis was performed. The adequacy of the data for factor analysis was tested using the Kaiser-Meyer-Olkin selective adequacy test and the Bartlett Sphericity test. CFA was carried out with model fit testing (standards according to Ullman [22]) and calculation of fit index χ^2, confidence χ^2, normalized fit index χ^2/df, GFI fit quality index, comparative fit index CFI, RMS residuals, and SRMR standardized RMS residuals.

To determine internal consistency, Cronbach's α coefficient for the entire questionnaire and separately for each area were calculated. Alpha values greater than 0.70 were considered acceptable. To determine reliability, the intraclass correlation coefficient (ICC) was calculated using the test-retest method.
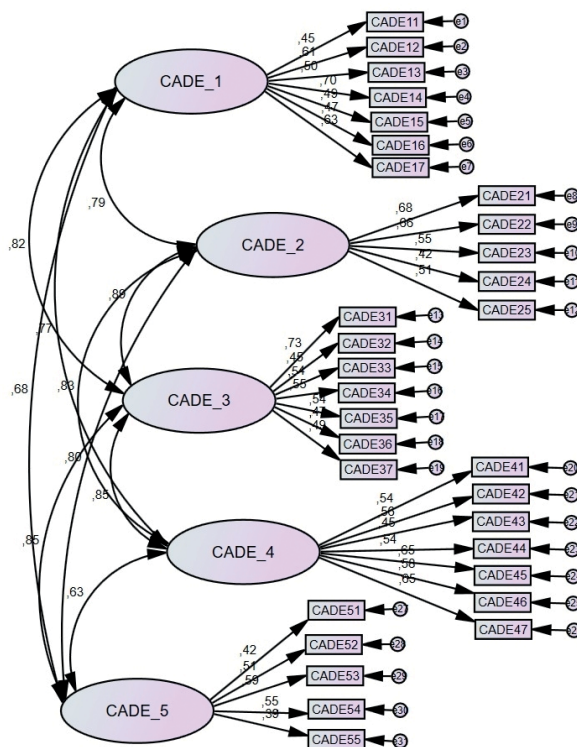

Figure 1. Graphical representation of the standardized factor loading of the questions of the Russian CADE-Q II.
Note: the codes CADE11 to CADE55 represent the questions of the CADE-Q II. CADE_1 to CADE_5 represent the 5 factors extracted in this analysis.

To assess criterion validity, differences in CADE-Q II scores were tested in accordance with participants' sociodemographic characteristics using t-tests and ANOVA, as applicable. In addition, Person's correlations were used to explore associations between CADE-Q II total/area scores and scores of other instruments, as applicable. Strength of the relationship (r) was classified as weak (r≤0.3), moderate 0.3<r≤0.8) and strong (0.8<r≤1) [23].

Results
Translation and Cultural Adaptation
All translated and back-translated items from the CADE-Q II were considered applicable to Russian patients. All of the items were considered understandable and remained untouched. At the pilot testing, 30 participants took a mean of 30 minutes to complete the Russian CADE-Q II. All of them identify the questionnaire was clear and easy to understand.

Participant Characteristics
The sample included 303 CCS patients (40.6% female) with a mean age of 65.0±6.4 years old. The sociodemographic and clinical characteristics of the sample is described in Table 1. As shown, participants were more likely to had higher educational level, being married and retired, with a low to average subjective assessment of family income. The study showed a signi-

Areas	Question	Item score (mean±SD)	Area score* (mean±SD)	Cronbach's α per area
Medical condition	1. Coronary Artery Disease is	0.86±1.20	10.50±5.0	0.69
	2. Angina (chest pain of discomfort) occurs	1.96±1.30		
	3. In a person with coronary artery disease, which of the following is a usual description of angina?	2.13±1.20		
	4. A heart attack occurs	1.22±1.40		
	5. The best resources available to help someone understand his/her medications are	1.46±0.90		
	6. Medications such as aspirin (ASA) and clopidogrel are important because	1.26±0.90		
	7. The "statin" medications, such as atorvastatin, rosuvastatin, or simvastatin, have a beneficial effect in the body by	1.54±1.20		
Risk factors	1. The risk factors for heart disease that can be changed are	1.49±1.20	3.34±3.3	0.67
	2. The actions that can be taken to control cholesterol levels include	1.50±1.10		
	3. The actions that can be taken to control blood pressure include	1.16±0.97		
	4. The first step towards controlling a risk factor (such as blood pressure or cholesterol) is	1.18±1.30		
	5. The actions to prevent developing diabetes include	1.0±0.87		
Exercise	1. What are the important parts of an exercise prescription?	1.25±1.38	10.53±5.1	0.67
	2. For a person living with heart disease, it is important to do a cardiovascular warm-up before exercising because	1.26±1.23		
	3. The pulse can be found	1.89±1.12		
	4. Three things that one can do to exercise safely outdoors in the winter are	1.22±1.39		
	5. The benefits of doing resistance training (lift weights or elastic bands) include	1.16±1.34		
	6. If a person gets chest discomfort during a walking exercise session, he or she should	2.27±1.06		
	7. How does a person know if he/she is exercising at the right level?	1.44±1.23		
Nutrition	1. What is the best source of omega 3 fats in food?	2.19±1.29	9.72±4.30	0.61
	2. Trans fat are	1.38±1.36		
	3. What is one good way to add more fiber to your diet	1.83±1.32		
	4. Which of the following foods has the most salt	1.44±1.13		
	5. What combination of foods can help lower blood pressure?	1.67±1.30		
	6. When reading food labels, what should one look at first?	0.94±0.37		
	7. How many servings of fruits and vegetables should adults consume?	0.27±0.52		
Psychosocial risk	1. Which of the below are effective stress management techniques?	1.01±1.17	7.67±4.07	0.69
	2. What stresses have been related to increased risk for heart attacks?	1.93±1.33		
	3. Which of the following describes your best option for reducing your risk from depression	1.96±1.39		
	4. It is important to recognize "sleep apnea" because	1.56±1.34		
	5. "Chronic stress" is defined as	1.20±1.38		
Total		-	44.73±17.22	0.88

Figure 2. Mean and standard deviation CADE-Q II item and area scores and Cronbach's α coefficient per area.

Note: * — maximum scores for areas are the following: medical condition, exercise and nutrition =21; risk factors and psychosocial risk =15.

Abbreviation: SD — standard deviation.

ficant (p=0.007) difference in disease-related knowledge levels depending on patient's education and CCS-type. No significant difference was found while comparing sex, marital status, occupation or family income. Given the history of myocardial infarction, previous PCI or CABG showed no difference in knowledge levels.

Psychometric Validation

First, the adequacy of the data for factor analysis was confirmed with a Kaiser-Meyer-Olkin of 0.692 and a significant Bartlett's criterion of Sphericity (p<0.05). Confirmatory factor analysis was then carried out according to factors proposed in the original version of the questionnaire [16]. As a result, the final four-factor experimental model showed satisfactory indicators of reliability and compliance with the originally proposed one (χ^2=554.71, df=421, χ^2/df=1.31,

p=0.312, CFI=0.761, GFI=0.908, RMSEA=0.05, SRMR=0.0797). The standardized factor loadings of the questions in the areas ranged from 0.39 to 0.73 (Figure 1). Factor 1 is related to medical condition items, factor 2 risk factors and exercise, factor 3 nutrition, and factor 4 psychosocial risk.

Cronbach's α coefficient for the entire questionnaire was 0.88 and for each area ranged from 0.6-0.7 (Figure 2), with nutrition questions being the only ones that fell slightly short of the 0.7 threshold. ICC was 0.81 (p<0.01).

When evaluating the criterion validity, a moderate positive correlation was found between CADE-Q II total scores and a patient's educational level (r=0.391, p<0.01). The "self-care confidence scale" of the SC-CHDI also weakly correlated with CADE-Q II total scores (r=0.251, p<0.05). Significant correlations were also found

between CADE-Q II total scores and the "vital activity" (r=0.225, p<0.05) and "psychological" (r=0.308, p<0.01) components of the SF-36.

Table 2 also presents the CADE-Q II scores by item and areas. The area with highest score was exercise and the one with the lowest was risk factors. The question "Coronary Artery Disease is" presented the lowest item score and the question "If a person gets chest discomfort during a walking exercise session, he or she should" presented the highest item score. Overall, more than 60% of respondents were correctly aware of the main manifestations of CAD, as well as ways to relieve its symptoms. However, only 19% of patients correctly answered the question about the importance of taking antiplatelet drugs, and 40% knew the importance of statins. A third of respondents (36%) were aware of modifiable risk factors for CAD and less than half (46%) were aware of ways to reduce blood pressure and cholesterol levels through diet. In addition, only 20% of patients correctly know the recommendations for maintaining physical activity, and 35% of the respondents were be able to choose the correct intensity of exercise. In regards to nutrition, over 70% of patients knew how to choose rich in omega acids foods, and almost 80% read the composition of products on packages. Finally, more than half of the respondents (54%) do not know about the concept and dangers of "chronic stress", as well as methods to reduce it. Overall, only 9% of respondents showed a sufficient overall level of knowledge about coronary artery disease.

Discussion

The aim of this study was to create a Russian questionnaire to assess CCS patients' knowledge about their condition and related factors. This was done through a rigorous process of translation, cross-cultural adaptation and psychometric validation. Pilot testing of the questionnaire confirmed the usability and applicability of the questionnaire. Factor analysis revealed five factors, aligned with the areas of the questionnaire. All other psychometric properties — internal consistency, reliability and criterion validity — were adequate, which confirmed the validity of the Russian version of the CADE-Q II.

The CADE-Q II has been previously validated into 3 languages — English (original), Portuguese, and Chinese [16, 24, 25]. Psychometric properties were similar in all studies. In all versions, the lowest scores were identified in the risk factors area. In addition, all studies — including this one — identified that question related to psychosocial risk presented many "I don't know" statements, which highlight the need for more attention to this subject matter.

The analysis of criterion validity was based on a previous study [26], with higher knowledge about the disease associated with higher educational level. These results are consistent with previous studies [16, 24, 27], as well as the validation of the other 3 versions of CADE-Q II [16, 24, 25]. Although weak, the correlation between "self-care confidence" scale of the SC-CHDI and CADE-Q II scores aligns with previous studies that report that knowledge can be associated with better behaviors[2]. Other correlations identified between CADE-Q II scores and SF-36 areas reinforce the need to create educational activities to educate CCS patients and improve their overall quality of life, as identified in studies with other patient populations [28-30].

As previously described, less than 10% of the sample presented a level of education considered sufficient. This result calls our attention for the need to educate this population. Individual-oriented approaches in the treatment of CCS patients, including patient education on self-care skills and setting individual goals for lifestyle modification, has been showed to not only increase disease-related knowledge, but improve heart-health behaviors, and even decrease morbidity and mortality [31-34].

Results of this study should be interpreted with caution. First, generalizability is not confirmed as respondents were recruited from only one center. Results may not be applicable to patients that attend CR programs or those outside of Volgograd. Future studies need to be conducted throughout different geographic regions of the Russian Federation. Second, important psychometric properties (such as construct validity) were not assessed. Third, multiple comparisons were undertaken, which can lead to a Type 1 error. Finally, the extent to which the Russian CADE-Q II can identify changes in knowledge before/after educational programs was not tested and should form the basis of future studies.

In conclusion, results from this multi-step study confirmed that the Russian version of CADE-Q II is a valid tool to measure disease-related knowledge among Russian chronic coronary syndrome patients. This questionnaire will be important to help CR programs identify knowledge levels of their patients and use this information to design educational efforts to address areas in need. It may also be a reliable tool for future evaluation of the effectiveness of educational programs in Russia.

---

[2] Kuodytė L. Sergančiųjų išemine širdies liga savirūpos ir žinių. 2019. https://lsmuni.lt/cris/bitstream/20.500.12512/101975/1/Kuodyte_Liucija.pdf (05 June 2022).

References

1. Mampuya WM. Cardiac rehabilitation past, present and future: an overview. Cardiovasc Diagn Ther. 2012;2(1):38-49. doi:10.3978/j.issn.2223-3652.2012.01.02.

2. Mendell J, Bates J, Banner-Lukaris D, et al. What Do Patients Talk About? A Qualitative Analysis of Online Chat Sessions with Health Care Specialists During a "Virtual" Cardiac Rehabilitation Program. Telemed J E Health. 2019;25(1):71-8. doi:10.1089/tmj.2017.0206.

3. Usacheva EV, Nelidova AV, Kulikova OM, Flyanku IP. Mortality of Russian able-bodied population from cardiovascular diseases. Hygiene and Sanitation. 2021;100(2):159-65. (In Russ.) Усачева Е. В., Нелидова А. В., Куликова О. М., Флянку И. П. Смертность трудоспособного населения России от сердечно-сосудистых заболеваний. Гигиена и санитария. 2021;100(2):159-65. doi:10.47470/0016-9900-2021-100-2-159-165.

4. Knuuti J, Wijns W, Saraste A, et al. 2019 ESC Guidelines for the diagnosis and management of chronic coronary syndromes. Eur Heart J. 2020;41(3):407-77. doi:10.1093/eurheartj/ehz425.

5. Piepoli MF, Hoes AW, Agewall S, et al. 2016 European Guidelines on cardiovascular disease prevention in clinical practice: The Sixth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of 10 societies and by invited experts) Developed with the special contribution of the European Association for Cardiovascular Prevention & Rehabilitation (EACPR). Eur Heart J. 2016;37(29):2315-81. doi:10.1093/eurheartj/ehw106.

6. Korzeniowska-Kubacka I, Bilińska M, Piotrowska D, et al. Impact of exercise-based cardiac rehabilitation on attitude to the therapy, aims in life and professional work in patients after myocardial infarction. Med Pr. 2019;70(1):1-7. doi:10.13075/mp.5893.00701.

7. Boyde M, Turner C, Thompson DR, Stewart S. Educational interventions for patients with heart failure: a systematic review of randomized controlled trials. J Cardiovasc Nurs. 2011;26(4):E27-35. doi:10.1097/JCN.0b013e3181ee5fb2.

8. Francis T, Kabboul N, Rac V, et al. The Effect of Cardiac Rehabilitation on Health-Related Quality of Life in Patients With Coronary Artery Disease: A Meta-analysis. Can J Cardiol. 2019;35(3):352-64. doi:10.1016/j.cjca.2018.11.013.

9. Kabboul NN, Tomlinson G, Francis TA, et al. Comparative Effectiveness of the Core Components of Cardiac Rehabilitation on Mortality and Morbidity: A Systematic Review and Network Meta-Analysis. J Clin Med. 2018;7(12):514. doi:10.3390/jcm7120514.

10. Bertelsen JB, Dehbarez NT, Refsgaard J, et al. Shared care versus hospital-based cardiac rehabilitation: a cost-utility analysis based on a randomised controlled trial. Open Heart. 2018;5(1):e000584. doi:10.1136/openhrt-2016-000584.

11. Awad A, Al-Nafisi H. Public knowledge of cardiovascular disease and its risk factors in Kuwait: a cross-sectional survey. BMC Public Health. 2014;14:1131. doi:10.1186/1471-2458-14-1131.

12. Turk-Adawi K, Supervia M, Lopez-Jimenez F, et al. Cardiac Rehabilitation Availability and Density around the Globe. EClinicalMedicine. 2019;13:31-45. doi:10.1016/j.eclinm.2019.06.007.

13. Ghisi GL, Santos RZ, Schveitzer V, et al. Development and validation of the Brazilian Portuguese version of the Cardiac Rehabilitation Barriers Scale. Arq Bras Cardiol. 2012;98(4):344-51. English, Portuguese. doi:10.1590/s0066-782x2012005000025.

14. de Melo Ghisi GL, Grace SL, Thomas S, et al. Healthcare providers' awareness of the information needs of their cardiac rehabilitation patients throughout the program continuum. Patient Educ Couns. 2014;95(1):143-50. doi:10.1016/j.pec.2013.12.020.

15. Bonin CD, Santos RZ, Ghisi GL, et al. Construction and validation of a questionnaire about heart failure patients' knowledge of their disease. Arq Bras Cardiol. 2014;102(4):364-73. doi:10.5935/abc.20140032.

16. Ghisi GL, Grace SL, Thomas S, et al. Development and psychometric validation of the second version of the Coronary Artery Disease Education Questionnaire (CADE-Q II). Patient Educ Couns. 2015;98(3):378-83. doi:10.1016/j.pec.2014.11.019.

17. Wild D, Grove A, Martin M, et al.; ISPOR Task Force for Translation and Cultural Adaptation. Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO) Measures: report of the ISPOR Task Force for Translation and Cultural Adaptation. Value Health. 2005;8(2):94-104. doi:10.1111/j.1524-4733.2005.04054.x.

18. Ware JE Jr. SF-36 health survey update. Spine (Phila Pa 1976). 2000;25(24):3130-9. doi:10.1097/00007632-200012150-00008.

19. Spertus JA, Winder JA, Dewhurst TA, et al. Development and evaluation of the Seattle Angina Questionnaire: a new functional status measure for coronary artery disease. J Am Coll Cardiol. 1995;25(2):333-41. doi:10.1016/0735-1097(94)00397-9.

20. Kabargina AI, Lopatin YM. Validity and reliability of the Russian-language version of the Self-Care of Coronary Heart Disease Inventory in patients with chronic coronary syndromes. Russ J Cardiol. 2020;25(9):3961. (In Russ.) Кабаргина А. И., Лопатин Ю. М. Валидность и надежность русскоязычной версии опросника способности к само-помощи "The Self-Care of Coronary Heart Disease Inventory" при хронических коронарных синдромах. Российский кардиологический журнал. 2020;25(9):3961. doi:10.15829/1560-4071-2020-3961.

21. Herrero MJ, Blanch J, Peri JM, et al. A validation study of the hospital anxiety and depression scale (HADS) in a Spanish population. Gen Hosp Psychiatry. 2003;25(4):277-83. doi:10.1016/s0163-8343(03)00043-4.

22. Ullman JB, Bentler PM. Structural equation modeling. In: Alice F Healy RWP. Handbook of Psychology, Volume 4: Experimental Psychology. 2005:661-90. ISBN: 9780471392620.

23. Dancey CP, Reidy J. Statistics without maths for psychology. Pearson education. 2007. ISBN: 0273726021.

24. Santos RZD, Ghisi GLM, Bonin CDB, et al. Validation of the Brazilian Version of CADE-Q II to Assess Knowledge of Coronary Artery Disease Patients. Arq Bras Cardiol. 2019;112(1):78-84. doi:10.5935/abc.20180244.

25. Chen Z, Geng J, Wang M, et al. The Chinese version of the Coronary Artery Disease Education Questionnaire-II (CADEQ-II): translation and validation. Patient Prefer Adherence. 2018;12:1587-96. doi:10.2147/PPA.S176639.

26. Gazmararian JA, Williams MV, Peel J, Baker DW. Health literacy and knowledge of chronic disease. Patient Educ Couns. 2003;51(3):267-75. doi:10.1016/s0738-3991(02)00239-2.

27. Marofi Z, Bandari R, Heravi-Karimooi M, et al. Cultural adoption, and validation of the Persian version of the coronary artery disease education questionnaire (CADE-Q): a second-order confirmatory factor analysis. BMC Cardiovasc Disord. 2020;20(1):345. doi:10.1186/s12872-020-01628-5.

28. Miraj SS, Roy RT, Unnikrishnan M, et al. Effect of patient-education on health-related quality of life of diabetic foot ulcer patients in a tertiarycare hospital. Value in Health. 2015;18(7), A621. doi:10.1016/j.jval.2015.09.2174.

29. Leino-Kilpi H, Johansson K, Heikkinen K, et al. Patient education and health-related quality of life: surgical hospital patients as a case in point. J Nurs Care Qual. 2005;20(4):307-16; quiz 317-8. doi:10.1097/00001786-200510000-00005.

30. Martínez-Miranda P, Casuso-Holgado MJ, Jesús Jiménez-Rejano J. Effect of patient education on quality-of-life, pain and fatigue in breast cancer survivors: A systematic review and meta-analysis. Clin Rehabil. 2021;35(12):1722-42. doi:10.1177/02692155211031081.

31. Chaves GSS, Lima de Melo Ghisi G, Britto RR, Grace SL. Maintenance of Gains, Morbidity, and Mortality at 1 Year Following Cardiac Rehabilitation in a Middle-Income Country: A Wait-List Control Crossover Trial. J Am Heart Assoc. 2019;8(4):e011228. doi:10.1161/JAHA.118.011228.

32. Ghisi GLM, Rouleau F, Ross MK, et al. Effectiveness of an Education Intervention Among Cardiac Rehabilitation Patients in Canada: A Multi-Site Study. CJC Open. 2020;2(4):214-21. doi:10.1016/j.cjco.2020.02.008.

33. Ghisi GL, Abdallah F, Grace SL, et al. A systematic review of patient education in cardiac patients: do they increase knowledge and promote health behavior change? Patient Educ Couns. 2014;95(2):160-74. doi:10.1016/j.pec.2014.01.012.

34. Ghisi GLM, Chaves GSS, Ribeiro AL, et al. Comprehensive Cardiac Rehabilitation Effectiveness in a Middle-Income Setting: A RANDOMIZED CONTROLLED TRIAL. J Cardiopulm Rehabil Prev. 2020;40(6):399-406. doi:10.1097/HCR.0000000000000512.