JA-CHRODIS

MULTIMORBIDITY CARE MODEL APPLICABILITY ASSESSMENT ACROSS DIFFERENT HEALTHCARE SETTINGS

2016

TASK 3





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Introduction

The European Joint Action on Chronic Diseases and Promoting Healthy Ageing across the Life Cycle (JA-CHRODIS) aims at promoting and facilitating a process of exchange and transferring of good practices between European countries and regions, addressing chronic conditions, with a specific focus on health promotion and prevention of chronic conditions, multimorbidity and diabetes.

During upcoming decades, European countries will encounter a great challenge because of ageing of the population and the constantly increasing incidence of many chronic diseases, such as type 2 diabetes mellitus (DM), cardiovascular diseases (CVD) and cancer [1]. The growing number of the elderly population, the improvement of medical care and, as a consequence, better survival of people affected by chronic conditions have caused a great rise in the number of people living with a chronic disease [2, 3]. Furthermore, as diseases tend to cluster, increasing numbers of people are found to have multiple diseases or medical conditions at the same time; that is called multimorbidity (≥2 chronic conditions) [1, 3, 4, 2]. The total estimated number of people with multimorbidity in the European Union (EU) is around 50 million. Multimorbidity has the highest prevalence among the elderly. Over the age of 65, the prevalence of multiple chronic diseases in some populations is reported around 65%, among people over the age of 85, reported as high as 85% [1, 3]. Multimorbidity is associated with disability and functional decline, increased use of polypharmacy, longer hospitalisations, lower quality of life, poor health related outcomes and higher premature mortality [4, 1, 5, 6].

With a rather big emphasis on acute care throughout the different healthcare systems in the EU, patients' long term care should be adequately addressed. Ageing population, more complex healthcare needs, ever growing number of people with multiple chronic conditions is and will be a substantial economic burden, challenging every healthcare system.

While sharing the same values, which include universality, access to good quality care, equity and solidarity, the healthcare systems across the EU differ substantially. Therefore, one of the biggest challenges for the European countries is to find a unified approach to address the problem. The greatest impediments for accomplishing this task are the differences in funding of healthcare systems, varying levels of access to the medical care and different functions of the medical care personnel across the different countries [7].

Multimorbidity Care Model Applicability Assessment Across Different Healthcare Settings is a part of the activity of work package 6 (WP6) of JA-CHODIS that aims to guide the development of a widely applicable

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integrated care model specifically designed for multimorbid patients. The applicability assessment allows to better understand the suitability of the created care model across the different healthcare settings in the EU. The applicability report sets the scene for the now planned implementation of the care model in different EU countries.

Methods

The applicability assessment of the Multimorbidity (MM) Care Model was carried out with the help of an online questionnaire. The task evaluated the applicability of the MM care model (Table 1), which was one of JA-CHRODIS deliverables. When defining the MM care model, 20 care model components were identified as a starting point across five domains of the proposed model, however, 16 of them were selected across the same five domains for the final version of the MM Care Model. The five domains included: 1) delivery of the care model system; 2) decision support; 3) clinical information system; 4) self-management support and 5) community resources. Every domain consists of smaller subgroups – the care model components. In the online questionnaire (Figure 2), every component was transferred into a question, asking to evaluate its applicability in the national healthcare setting. Every question (component) could be evaluated in a scale from 0 to 10, where 0 means that the component is not applicable in that healthcare setting and 10 – very applicable. Furthermore, there was additional space left for comments and remarks. This field was optional and experts were free to choose if they wanted to comment.

The experts, who were targeted to complete the online applicability assessment, were due to represent different healthcare systems across the EU. Two groups of experts were contacted. As part of the ICARE4EU project, national healthcare experts, representing the country, were identified. In the first group, all ICARE4EU project country experts were contacted for this applicability assessment. More detailed information about ICARE4EU and expert selection is available on the webpage www.icare4eu.org. Another group that evaluated the applicability of MM Care Model was JA-CHRODIS Governing Board (GB) members. The GB was created to set up an appropriate framework for the participation of European Union (EU) and European Economic Area (EEA) Member States in JA-CHRODIS. The members of GB include representatives of Ministries of Health, representatives of the European Commission (EC) and European Region of the World Health Organisation. Due to low response rate, the experts were reminded to take part in the applicability assessment and the deadline for submitting the assessment was extended once.

In the case of two responses from the same country but from different people (those were Cyprus, Croatia and Estonia, Norway, Netherlands), we included a higher score to the chart, considering that both responders are equally qualified to evaluate a healthcare system of their country, and if one of them states that a component is applicable, it probably means that there are possible ways to adapt this component to their system. Furthermore,

there were three anonymous responses, which, due to unfeasibility to assign the evaluations to any country, were withdrawn from further analysis.

Results

The questionnaire was sent to experts from 29 European countries, including 26 EU countries plus Iceland, Norway and Switzerland. Geographical distribution is shown in Figure 1. There were a total of 23 responses (three of them were anonymous and were excluded) received. A total of 20 responses from 15 countries, i.e. Belgium, Bulgaria, Cyprus, Croatia, Estonia, Finland, Germany, Greece, Iceland, Italy, Luxembourg, Netherlands, Norway, Portugal and France, were included into further analysis. Four questionnaires were filled out by the Governing Board members from Cyprus, Croatia, Belgium and Estonia. The representatives from each country are shortly described in Table 2.

An example of a questionnaire, which was sent to experts, is shown at the end of this report (Figure 2). The questionnaire can be accessed by following this link (click or copy in your browser): https://docs.google.com/forms/d/1ad0Ntn3pW2bHNr9vPexIqqq8DGMD7p3lyGKCDbgT ns/viewform

The average applicability score varied between 5 and 7, depending on the criteria. All but Bulgaria, Cyprus and Greece confirmed, that there are no non-applicable components in their national healthcare setting. Bulgaria stated that components 7 (Developing a consultation system to be adviced by professional experts) and 14 (Patient-operated technology allowing patients to send information to their care providers) are not applicable in their health system. Cyprus assessed component 12 (Exchange of patient information (with a patient's permission) between care providers and sectors by compatible clinical information systems) as non applicable. Experts from Greece indicated that whole MM care model is hardly applicable in their country, five components (1, 3, 4, 12 and 13) were stated as non applicable. The highest applicability scores were received from Norway. Experts from this country confirmed that nearly all the components are fully applicable, except for 4, 12, 14, 15, 16. However, mentioned components were also evaluated as highly applicable with the applicability scores varying from 5 to 8. Similar applicability levels were reached in Estonia, where every component received more than 7 applicability points. However, only three components (5, 12, 13) in this country were indicated as very applicable and reached the maximum score. Almost half of the responding countries (Belgium, Estonia, France, Italy, Luxembourg, Norway and Finland) stated the whole MM care model as highly applicable with the applicability scores more than 4 given for every component. Otherwise, most countries did not give maximum scores for the MM care model components. The highest average score (7,2) was reached by component 16 involvement of a social network (informal), including friends, patients' associations, families, neighbours.

However, it was not evaluated by Luxembourg, which did not evaluate another five components (6, 7, 8, 14, 15) either.

More detailed responses from all the mentioned countries are represented in Figure 3 at the end of this report. Furthermore, representatives from different countries provided their comments and remarks about the MM care model's applicability. A summary of the comments is listed in Table 3.

Discussion and Conclusions

An increasing proportion of the chronically ill people suffers from multimorbidity [3]. They are thought to be at increased risk of receiving sub-optimal care, more frequent and longer hospitalisations, increased use of polypharmacy and higher healthcare costs [4], translating to a substantial economic burden for health systems [5]. Therefore, integrated care for people with multiple chronic conditions is urgently needed, which would allow to make more efficient use of limited resources. However, there are many different member states with even more different health care systems across them, so the question is: how is it possible, and is it possible at all, to have a very unified multimorbidity care model in all countries? To get an answer to this question, partners of JA-CHRODIS WP6 decided to provide a care model, which covers the core of the problem and basic of what needs to be taken into a consideration, and leave any other components, not mentioned in the MM care model as optional for the member states to decide if they want to add them on their care model or not.

To our knowledge, the Multimorbidity Care Model Applicability report is the first official document that widely investigates the applicability of a single care model for multimorbidity patients across different healthcare settings in European countries. The responses to this questionnaire have not been used to examine the performance of policies or programmes in any given country, to rank countries according to their policies and programmes or as a benchmarking tool. The answers were intended to identify possible applicability issues for further implementation of the suggested integrated multimorbidity care model across the different healthcare settings.

The overall aims of the applicability assessment were: 1) to assess if the components of the multimorbidity care model are applicable across different member states; 2) if applicable, to what level; 3) how many components are not applicable if there are any, and in which countries; 4) pre-select most suitable settings for piloting the suggested care model across the different EU member states.

The average MM care model applicability score varied between 5 and 7. All countries, except Bulgaria, Cyprus and Greece confirmed, that all the components are applicable in their national healthcare systems. Experts from each country submitted comments, remarks and suggestions that should be taken into consideration to improve the model. From the comments, provided by the experts involved, the criteria are being spoken about and

in most cases some work has already been done locally. Nonetheless, without an integrated model and a way of including all criteria while providing care for every patient, there is a difficulty to experience the full benefits of the suggested care model. Some countries have started the implementation pilots; however, it is too early for assessing the outcomes.

Table 1. Components of Multimorbidity Care Model

	COMPONENT	DESCRIPTION
	DELIVERY OF	THE CARE MODEL SYSTEM
1	Regular comprehensive assessment of patients	Comprehensive assessment is a diagnostic process that should be used to determine medical, psychological, and functional capabilities of patients with multimorbidity in order to develop a coordinated and integrated care plan for multidisciplinary treatment and long-term follow-up of the patients.
2	Multidisciplinary, coordinated team	A multidisciplinary team aims at increasing efficiency and accessibility of care by providing coordinated multidisciplinary care both in terms of different levels of the healthcare profession (nurses, physicians, physiotherapists, social workers, etc.), and different disease specializations.
3	Professional, appointed as a coordinator of an individualised care plan and a contact person for a patient and a family ("a case manager")	A case manager should act as an individualised care plan coordinator who intermediates between a patient and various members of the multidisciplinary team to manage care, actively linking the patient to the providers of medical services, providing residential, social, behavioural, and other support services when needed in the most effective way, monitoring continuity of care, follow-up, and documentation.
4	Individualised care plans	Individualised, coordinated and integrated plans for the treatment and long-term follow-up of patients should be developed based on the comprehensive assessment by a multidisciplinary team, including a patient-centred approach that considers preferences of the patients, and prioritization of cross-disease, holistic approach, including targeting symptoms, functional ability, quality of life, desired patient outcomes, etc.
		CISION SUPPORT
5	Implementation of evidence based practice	Flexible application of disease-specific evidence based guidelines, with consideration of multimorbidity, disease interactions, and drug-drug interactions should be used. Healthcare providers should promote clinical care that is consistent with available scientific evidence and patient

		preferences.
6	Training of members of a	Training members of a multidisciplinary team aims at
	multidisciplinary team	improving professional knowledge and skills and focuses on
		comprehensive assessment concepts, multimorbidity and its
		consequences, health outcomes, innovation technologies,
		implementation of individualised treatment/care plans and
		goal setting, working effectively as a team, training in critical
		appraisal of knowledge and evidence based knowledge,
		patient-centeredness, patient empowerment, and self-
		management.
7	Developing a consultation system to be	This component encompasses the development of a
	adviced by professional experts	consultation system to increase accessibility to a very
		specific professional knowledge. A consultation system aims
		at providing decision support in situations where further
		clinical support or knowledge is needed outside of the core
		team.
		NAGEMENT SUPPORT
8	Training of care providers to tailor self-	Comprehensive training of health care providers should aim
	management support based on the	at supporting self-management among patients and their
	patient's preferences and competencies	caregivers, encouraging patients to increase health literacy,
		tailored health promotion and prevention strategies.
9	Providing options for patients and	Provision of options for patients to improve their self-
	families to improve their self-	management should be personalized and consistent with
	management	their individualised care plans, taking into account their
		knowledge, educational level, health literacy, and functional
		aspects. It aims at improving self-management, promoting
		healthy lifestyles, and encouraging patients to actively
		participate in decision making, while supporting them in
		coping with chronic conditions in their daily life. Family
		members should be included and family education should
		be encouraged with the consent of the patient.
10	Shared decision making (a care provider	Health care professionals should encourage patients (and,
	and patients)	where relevant, their families) to actively participate in
		decision making about their care and treatment, including
		identification of their individual needs as well as developing
	INFORMATION	of future goals and outcomes. SYSTEMS AND TECHNOLOGY
11		
11	Electronic patient's records and	Electronic patient records and computerised clinical charts
	computerised clinical charts	should be regarded as an electronic technology used to
		enter data and manage the care of the patients, to keep
		track of their medical history, diagnoses, symptoms, hospital
		visits, health care utilisation, care needs or medication, etc.,
		allowing different providers of health and social care to

		share information about a national professible using
		share information about a patient, preferably using
40	5 1 5 11 11 11	standardised tools and similar diagnostic systems.
12	Exchange of patient information (with a	Exchange of patient information (with the consent of the
	patient's permission) between care	patient) involves different providers of health and social
	providers and sectors by compatible	care that share information about a patient between the
	clinical information systems	multimorbidity team and multiple care providers preferably
		using standardised or compatible tools and similar
		diagnostic systems.
13	Uniform coding of patients' health	Uniform classification system for coding diagnoses and
	problems where possible	other information related to the patient's treatment and
		care should be used for ensuring continuity of care and
		sharing of information between nurses, physicians, and
		other care providers to evaluate and record symptoms,
		diagnoses, medication, patient-reported outcomes,
		individualised treatment/care plans, and aspects of health
		care utilisation.
14	Patient-operated technology allowing	Patient-operated technology should allow patients to send
	patients to send information to their care	health monitoring information to their care providers to
	providers	complement face to face visits (with the consent of the
		patient). This should include technology tailored to the
		patient's needs which allows health care professionals to
		view, monitor, and react to information received directly
		from their patient via the technology aiming to reduce
		health care utilisation and improve clinical outcomes.
		Potential target populations include patients who live
		remotely, or those with low social support or with reduced
		mobility.
	SOCIAL AND	COMMUNITY RESOURCES
15	Supporting access to community and	This component enables improvement of the patient's
	social resources	access to community resources, formal care, and patient
		associations, support groups, and psychosocial support
		(including home help, transportation, etc.), and supports
		access to such services.
16	Involvement of a social network	This component comprises the involvement of the patient's
	(informal), including friends, patients'	informal social network, including family, friends, patients'
	associations, families, neighbours	associations and neighbours within the treatment or care, to
		increase the social support network.
	1	1

Table 2. List of respondents

No.	Country	GB members	Experts
		(Organisation)	(Organisation)
1.	Belgium	FPS Health, Food Chain Safety and	
		Environment	
2.	Bulgaria		Medical University "Prof. Dr. P. Stoyanov" – Varna
3.	Cyprus	Ministry of Health	St George's, University of London Medical School, at
			the University of Nicosia, Nicosia
4.	Croatia	Croatian Institute of Public Health	Andrija Stampar Institute of Public Health, Zagreb
5.	Estonia	Ministry of Health (Health System	University of Tartu
		Development Department)	Department of Internal Medicine
6.	Finland		University of Eastern Finland
			Department of Health and Social Management
7.	France		URCEco lle de France, Département de la Recherche
			Clinique et du développement, Assistance Publique
			Hôpitaux de Paris
8.	Germany		Technical University Berlin (TUB) Department of
			Health Care Management
9.	Greece		50Plus Hellas, Athens
10.	Iceland		The Directorate of Health in Iceland, Department of
			Supervision and Quality
11.	Italy		Gruppo di Ricerca Geriatrica, Brescia
12.	Luxembourg		Centre de Recherche Public de la Santé – CRP-Santé
13.	Norway*		The Norwegian Knowledge Centre for the Health
			Services (NOKC)
14.	Portugal		Direcção Geral da Saúde, Lisboa
15.	The Netherlands*		Organisation was not specified.

 $[\]ensuremath{^*}$ Two experts from this country responded.

Table 3. Comments by different country representatives**

Country	Comment
The Netherlands	A MM Care Model implementation pilot started.
Italy	 If the model was to be used, there is a concern that the impact on the workload for the national health system would probably be huge. Care should be a great part of the model. It was suggested that it could be helpful for the questionnaire to go through a consensus model
Norway	 It is considered a very useful product of the JA, in line with what is being planned or trailed in Norway.
Slovenia	 The interrelations between components should be taken into account, it might be worth ranking the components. Did health economics experts intervene? Efficiency should be included in the components.
Belgium	 Has there been any interaction with NICE re the Multimorbidity Guidelines they are preparing? There are pilots to be carried out in Belgium next year where they can test this model.
France	Patients should be included more in the process.
	 There might be a need to change legislation to implement the model. Bulgaria has a programme on chronic diseases that changes annually, they could include a pilot of the model next year.
Estonia	 The model is valuable as they have pilots on integrated care. There is a lot of medical data available but there is a problem linking it to social data because of privacy issues.
	 Currently reforming their primary care system by having outpatient clinics with health care givers to treat chronic patients outside of hospitals.

^{**} Only countries, which commented in the *Comments and remarks* section are included.

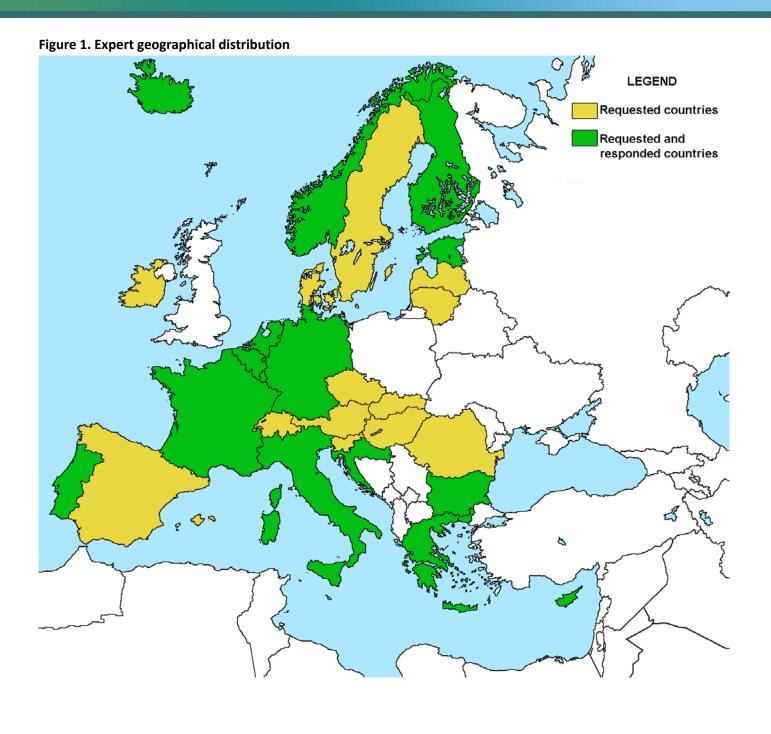


Figure 2. Questionnaire of multimorbidity care model applicability

16 components for evaluation

Dear colleagues,

You are kindly asked to respond the questionnaire and evaluate the following multimorbidity care model components to the extent of their implementation available in your national healthcare setting.



Your Name

Jūsų atsakymas

Your email

Jūsų atsakymas

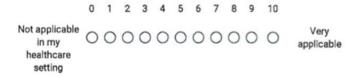
Country you are representing

Jūsų atsakymas

DELIVERY OF THE CARE MODEL SYSTEM

1. Regular comprehensive assessment of patients

Comprehensive assessment is a diagnostic process that should be used to determine medical, psychological, and functional capabilities of patients with multimorbidity in order to develop a coordinated and integrated care plan for multidisciplinary treatment and long-term follow-up of the patients.



Comment

Jūsų atsakymas

2. Multidisciplinary, coordinated team

A multidisciplinary team aims at increasing efficiency and accessibility of care by providing coordinated multidisciplinary care both in terms of different levels of the healthcare profession (nurses, physicians, physiotherapists, social workers, etc.), and different disease specializations.

0 1 2 3 4 5 6 7 8 9 10
Not applicable in my Very applicable healthcare setting
Comment
Jūsų atsakymas
Professional, appointed as a coordinator of an individualized care plan and a contact person for a patient and a family ("a case manager")
A case manager should act as an individualized care plan coordinator who intermediates between a patient and various members of the multidisciplinary team to manage care, actively linking the patient to the providers of medical services, providing residential, social, behavioural, and other support services when needed in the most effective way, monitoring continuity of care, follow-up, and documentation.
Not applicable in my healthcare setting
Comment
Jūsų staakymas
4. Individualized care plans
Individualized, coordinated, and integrated plans for the treatment and long-term follow-up of patients should be developed based on the comprehensive assessment by a multidisciplinary team, including a patient-centred approach that considers preferences of the patients, and prioritization of cross-disease, holistic approach, including targeting symptoms, functional ability, quality of life, desired patient outcomes, etc.
Not applicable on the setting of the
Comment
Jūsų atsakymas
DECISION SUPPORT
5. Implementation of evidence based practice
Flexible application of disease-specific evidence based guidelines, with consideration of multimorbidity, disease interactions, and drug-drug interactions should be used. Healthcare providers should promote clinical care that is consistent with available scientific evidence and patient preferences.
Not applicable Very in my healthcare setting

Comment
Jūsų atsakymas
6. Training of members of a multidisciplinary team
Training members of a multidisciplinary team aims at improving professional knowledge and skills and focuses on comprehensive assessment concepts, multimorbidity and its consequences, health outcomes, innovation technologies, implementation of individualized treatment/care plans and goal setting, working effectively as a team, training in critical appraisal of knowledge and evidence based knowledge, patient-centeredness, patient empowerment, and self-management.
Not applicable in my healthcare setting
Comment
Jūsų atsakymas
7. Developing a consultation system to be adviced by
professional experts
This component encompasses the development of a consultation system to increase accessibility to a very specific professional knowledge. A consultation system aims at providing decision support in situations where further clinical support or knowledge is needed outside of the core team.
Not applicable in my OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
Comment
Jūsų atsakymas
SELF MANAGEMENT SUPPORT
8. Training of care providers to tailor self-management support based on the patient's preferences and competencies
Comprehensive training of health care providers should aim at supporting self-management among patients and their caregivers, encouraging patients to increase health literacy, tailored health promotion and prevention strategies.
Not applicable in my healthcare setting
Comment
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9. Providing options for patients and families to improve their self-management

Provision of options for patients to improve their self-management should be personalized and consistent with their individualized care plans, taking into account their knowledge, educational level, health literacy, and functional aspects. It aims at improving self-management, promoting healthy lifestyles, and encouraging patients to actively participate in decision making, while supporting them in coping with chronic conditions in their daily life. Family members should be included and family education should be encouraged with the consent of the patient.

Not applicable in my healthcare setting Not applicable of the comment of the com
Jūsų atsakymas
10. Shared decision making (a care provider and patients)
Health care professionals should encourage patients (and, where relevant, their families) actively participate in decision making about their care and treatment, including identification of their individual needs as well as developing of future goals and outcomes
Not applicable in my
Comment
Jūsų atsakymas
INFORMATION SYSTEMS AND TECHNOLOGY
11. Electronic patient's records and computerized clinical
charts
Electronic patient records and computerized clinical charts should be regarded as an electronic technology used to enter data and manage the care of the patients, to keep trac of their medical history, diagnoses, symptoms, hospital visits, health care utilization, care needs or medication, etc., allowing different providers of health and social care to share information about a patient, preferably using standardized tools and similar diagnostic systems.
Not applicable in my healthcare setting
Comment
Jūsų atsakymas

12. Exchange of patient information (with a patient's permission) between care providers and sectors by compatible clinical information systems Exchange of patient information (with the consent of the patient) involves different providers of health and social care that share information about a patient between the multimorbidity team and multiple care providers preferably using standardized or compatible tools and similar diagnostic systems. Not applicable on the second of the second o Very applicable healthcare setting Comment Jūsų atsakymas 13. Uniform coding of patients' health problems where possible Uniform classification system for coding diagnoses and other information related to the patient's treatment and care should be used for ensuring continuity of care and sharing of information between nurses, physicians, and other care providers to evaluate and record symptoms, diagnoses, medication, patient-reported outcomes, individualized treatment/care plans, and aspects of health care utilization. Not applicable o o o o o o o o o o applicable healthcare setting Comment Jüsy atsakymas 14. Patient-operated technology allowing patients to send information to their care providers Patient-operated technology should allow patients to send health monitoring information to their care providers to complement face to face visits (with the consent of the patient). This should include technology tailored to the patient's needs which allows health care professionals to view, monitor, and react to information received directly from their patient via the technology aiming to reduce health care utilization and improve clinical outcomes. Potential target populations include patients who live remotely, or those with low social support or with reduced mobility. Not applicable Verv 0000000000 in my applicable healthcare setting Comment Jūsų atsakymas

SOCIAL AND COMMUNITY RESOURCES

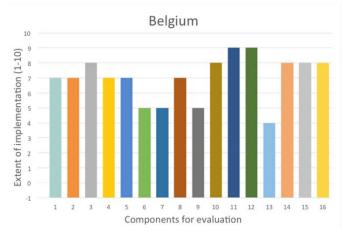
15. Supporti	ng access	to comm	nunity- a	nd socia	al-res	ources
This component of formal care, and p home help, transp	atient associa	tions, suppo	rt groups, an	d psychoso	ocial sup	
Not applicable in my healthcare setting	000	000	000	00	0	Very applicabl
Comment						
Jūsų atsakyma	s					
16. Involven friends, patie						ding
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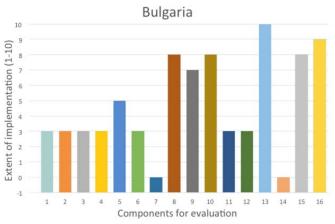
Figure 3. Detailed responses from all the countries.

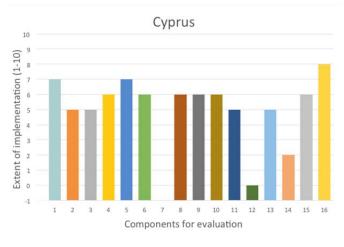
Number "-1" (no column) on the vertical axis means that the country did not evaluate the criteria, zero means that the component was assessed as non-applicable in that healthcare setting.

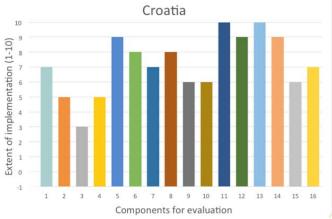
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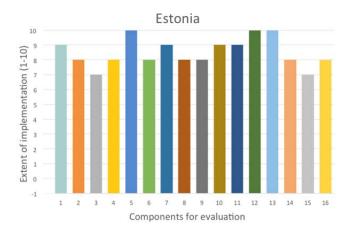
- 1. Regular comprehensive assessment of patients
- 2. Multidisciplinary, coordinated team
- 3. Professional, appointed as a coordinator of an individualized care plan and a contact person for a patient and a family ("a case manager")
- 4. Individualized care plans
- 5. Implementation of evidence based practice
- 6. Training of members of a multidisciplinary team
- 7. Developing a consultation system to be adviced by professional experts
- 8. Training of care providers to tailor self-management support based on the patient's preferences and competencies
- 9. Providing options for patients and families to improve their self-managemen
- 10. Shared decision making (a care provider and patients)
- 11. Electronic patient's records and computerized clinical charts
- 12. Exchange of patient information (with a patient's permission) between care providers and sectors by compatible clinical information systems
- 13. Uniform coding of patients' health problems where possible
- 14. Patient-operated technology allowing patients to send information to their care providers
- 15. Supporting access to community- and social-resources
- = 16. Involvement of a social network (informal), including friends, patients' associations, families, neighbours

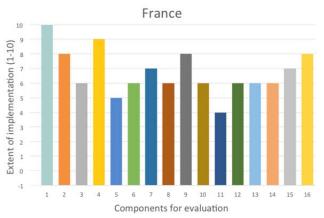


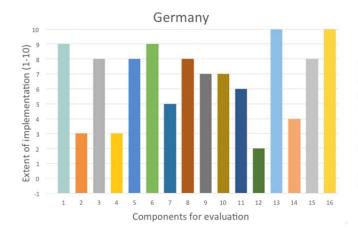


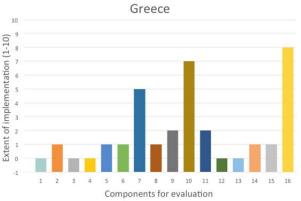


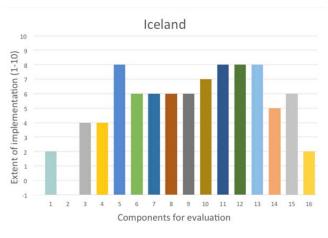


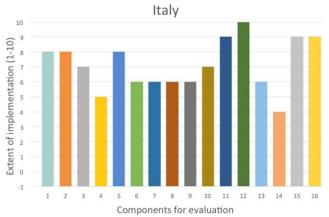


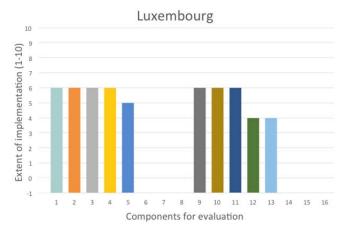


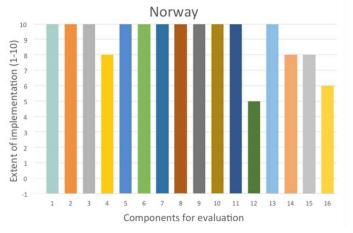


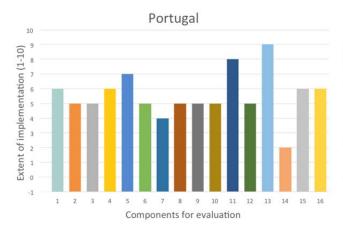


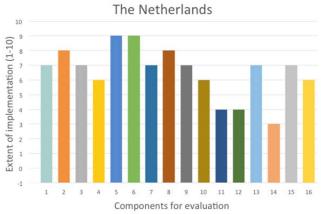


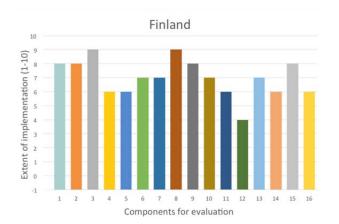












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