



# What are the Needs of People Living in Remote Areas About the Essential Components of a Cardiac Rehabilitation Program? Quels sont les besoins des personnes vivant en régions éloignées au regard des composantes essentielles d'un programme de réadaptation cardiaque?

Jessica Bernier, Melissa Lavoie and Marie-Eve Poitras

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Article abstract

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## What are the Needs of People Living in Remote Areas About the Essential Components of a Cardiac Rehabilitation Program?

### Quels sont les besoins des personnes vivant en régions éloignées au regard des composantes essentielles d'un programme de réadaptation cardiaque?

**Jessica Bernier**  <https://orcid.org/0000-0003-0129-4840>, RN, M. Sc., Ph. D. Student in Nursing science, Health Department, Université de Sherbrooke, Quebec, Canada

**Melissa Lavoie**  <https://orcid.org/0000-0003-1690-2183>, RN, Ph. D., Professor, Health Department, Université du Québec à Chicoutimi, Quebec, Canada

**Marie-Eve Poitras**  <https://orcid.org/0000-0002-3315-0190>, RN, Ph. D., Professor, Junior 1 FRQS<sup>a</sup> researcher, CRMUS<sup>b</sup> Research Chair Optimal Professional Practices in Primary Care, Family Medicine and Emergency Department, Université de Sherbrooke, Quebec, Canada

<sup>a</sup> Fonds de recherche du Québec – Santé

<sup>b</sup> Centre de recherche médicale de l'Université de Sherbrooke

#### Correspondance | Correspondence:

Jessica Bernier, RN, M. Sc, Ph. D. Student in Nursing science  
Health Department, Université de Sherbrooke  
Université de Sherbrooke - Campus Saguenay, 305 Rue Saint Vallier, Chicoutimi, QC (Canada)  
G7H 5H6

[Jessica.bernier3@usherbrooke.ca](mailto:Jessica.bernier3@usherbrooke.ca)

## Keywords

cardiac rehabilitation; needs; myocardial infarction; primary care; remote area; nurse

## Abstract

**Introduction:** Cardiac rehabilitation (CR) is an effective intervention to support patients in achieving their health objectives and in decreasing their risk of suffering from another myocardial infarction (MI). However, in several remote areas, no cardiac rehabilitation program (CRP) exists to support patients having experienced an MI. Before the creation of an intervention CRP adapted to patients living in these areas, it is essential to describe patients and healthcare professionals' needs regarding cardiac rehabilitation care. **Objective:** This study describes the needs of remote patients and healthcare professionals for the essential components in a CR program following myocardial infarction and percutaneous transluminal coronary angioplasty. **Methods:** A qualitative formative research study was conducted involving 10 men, 6 women, and 4 family physicians. Data were collected through in-depth individual interviews and one focus group. **Results:** Results show that patients who have suffered an MI have multiple unmet needs. This gap may be due to the variability in follow-ups by healthcare professionals. In the absence of a cardiac rehabilitation program, these patients must adapt quickly to their new health condition. **Discussion and conclusion:** It is critical that the needs of patients living in remote areas are better addressed in cardiac rehabilitation. To do this, it is essential to create a CRP that is tailored to the needs of both patients and professionals, thus providing patient-centered care.

## Résumé

**Introduction :** La réadaptation cardiaque (RC) est une intervention efficace pour aider les patients à atteindre leurs objectifs de santé et à réduire leur risque de souffrir d'un autre infarctus du myocarde (IM). Cependant, dans plusieurs régions éloignées, aucun programme de réadaptation cardiaque (PRC) n'existe pour soutenir les patients ayant subi un IM. Avant la création d'une intervention de PRC adapté aux personnes vivant en régions éloignées, il est essentiel de décrire les besoins des patients et des professionnels de la santé en matière de soins de RC. **Objectif :** Cette étude décrit les besoins des patients et ceux perçus par les professionnels de la santé des régions éloignées, au regard des composantes essentielles d'un PRC à la suite d'un IM et d'une angioplastie coronarienne transluminale percutanée. **Méthodes :** Une étude de type recherche formative qualitative a été menée auprès de 10 hommes, 6 femmes et 4 médecins de famille. Les données ont été recueillies au moyen d'entrevues individuelles et d'un groupe de discussion. **Résultats :** Les résultats montrent que les patients qui ont souffert d'un IM ont de multiples besoins non comblés suivant un évènement cardiaque. Ce manque peut être, entre autres, provoqué par la variabilité des suivis offerts par les professionnels de la santé. En l'absence d'un programme de réadaptation cardiaque, ces patients doivent s'adapter rapidement à leur nouvel état de santé. **Discussion et conclusion :** Il est primordial que les besoins des patients vivant en régions éloignées soient mieux pris en compte en réadaptation cardiaque. Pour ce faire, il est essentiel de créer un PRC adapté aux besoins des patients et des professionnels et ainsi d'offrir des soins centrés sur le patient.

## Mots-clés

réadaptation cardiaque; besoins; infarctus du myocarde; soins primaires; région éloignée; infirmière

## INTRODUCTION

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Cardiovascular disease is the second leading cause of death among Canadians. Between 2009 and 2010, the number of myocardial infarctions (MI) in Canada was 66,500 and 17,600 in Quebec. People in remote areas are also heavily affected by this disease and the number of people affected is increasing each year (Institut national de santé publique du Québec, 2017).

The best treatment option after MI is percutaneous transluminal coronary angioplasty (PTCA) (O'Gara et al., 2013). However, this intervention is not always carried out near the patient's residence. It is the case for many patients living in a remote area (Statistics Canada, 2018) such as those who live in the Côte-Nord region (Quebec, Canada); the region where our study was conducted. Remote areas are known to be served only by basic medical resources (primary care facilities and first referral hospitals) which depend on more specialized resources located more than 30 minutes away (Canadian Association of Emergency Physicians, 1997). For those patients, the PTCA intervention is achieved in an urban area (Institut national d'excellence en santé et en services sociaux, 2016), located more than 640 Km from their residence. For patients who have suffered an MI and gone through PTCA, it is essential that they participate in cardiac rehabilitation (CR) (Institut de cardiologie de l'université d'Ottawa, 2016). CR is an effective secondary and tertiary prevention strategy that reduces the risk of MI recurrence through an interprofessional cardiac rehabilitation program (CRP), which increases functional and cardiac capacity as well as quality of life (Ghannem et al., 2015).

To date, certain studies have reported the lack of specialized services in remote areas (Bhuyan et al., 2013; Parsons et al., 2021) and the lack of accessibility to a CRP is a barrier that prevents people from improving their living conditions in the long term (Angus et al., 2018). Large territories, the remoteness from major urban centers, limited access to specialized services, and limited healthcare availability are some of the factors that may explain this disparity (Seguin et

al., 2016). As of this date, no study has documented the components of cardiac rehabilitation in a remote area such as the Côte-Nord.

For more than 25 years, the World Health Organization (WHO) (1993) has argued that CR is essential and must be available to every person who has suffered from MI to ensure understanding, prevention, and equal access to health services. The absence of a CRP can have negative long-term effects on patients, including the occurrence of another MI as they already suffer from multiple health problems and present several risk factors (Sjöström-Strand et al., 2013).

Prior to the creation of a CRP adapted to patients living in a remote area, it is essential to describe patients' and healthcare professionals' needs regarding CR care.

## OBJECTIVE

This study describes the needs of remote patients and healthcare professionals for the essential components in a CR program following myocardial infarction and PTCA.

## METHODS

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### DESIGN

A qualitative formative research design was used to document the needs in order to create an intervention program in a specific context, namely the CR experience after MI and PTCA living in remote areas. Exploring a phenomenon using a formative research design will provide information on potential culturally and geographically appropriate intervention program for the population (Gittelsohn et al., 2006). This type of design may include qualitative and/or quantitative data collection methods to determine the needs of a community for the development, the implementation, or the evaluation of a program (Tolley et al., 2016).

### CONCEPTUAL MODEL

The British Association for Cardiovascular Prevention and Rehabilitation (BACPR) has created an interdisciplinary operational model aiming to

develop a program for CR (BACPR, 2017). It is a framework that favours the inclusion of nurses among the multidisciplinary team and enhances their role in partnership with the patients in terms of evaluation, follow-up, and planning of care. The needs of patients were described using four essential building blocks of the interdisciplinary model specific to CR. The first component is the lifestyle risk factor management which includes support to resuming sports, smoking cessation, committing to a healthy eating plan, and weight management. The second component is psychosocial health, which provides support to reduce anxiety and prevent depression. The third medical risk management component suggests assistance in the management of high blood pressure, diabetes, cholesterol and medication intake. Finally, the last building block consists of educating the patient and encouraging health behaviour changes (BACPR). The BACPR model (2017) proposes long-term management and assessments, and audits, which were not included in this study. Indeed, these two components aim to assess an already implemented RCP, which does not apply to our study.

#### **STUDY SETTING**

The study was conducted in a Family Medicine Group (FMG). FMGs are primary care organizations where family physicians and registered nurses provide care and services to enrolled patients from an interprofessional perspective. Other healthcare professionals may sometimes be present (e. g. social worker, dietician, etc.) (Gouvernement du Québec, 2018).

#### **PARTICIPANTS**

The participants included in the study were patients who had been through MI followed by a PTCA, and health professionals involved in monitoring their health. For the remainder of this article, we will use the term study participants when referring to patients and health care professionals. Non-probability sampling by reasoned choice and network was used (Patton, 2015). The patients had to fulfill the following inclusion criteria: 1) having suffered a MI in the two years before the research project; 2) undergone a

PTCA in an urban specialized facility; and 3) followed in an FMG. Patients were excluded if they: 1) suffered an MI with complications; 2) undergone a coronary artery bypass surgery; 3) had severe heart failure; 4) were not French speaking; 5) were unable to give their informed consent; or 6) were suffering from any type of dementia. For healthcare professionals, the only inclusion criteria were to hold a position at the FMG and be available at the time of the study. The family physician in charge of the FMG informed family physicians and nurses about the study to obtain permission to contact the patients. Then, family physicians participating in the study targeted patients enrolled in their FMG who met the inclusion criteria. These patients were contacted by their physician to obtain permission to be contacted by the research team. The first author reached out patients who accepted to verify their eligibility and explain the project. Information posters were placed in various locations throughout the city to inform the target population about the project. Subsequently, an informal meeting was held with interested healthcare professionals to answer any questions. All participants were volunteers and well informed of the study purpose and read and accepted the consent form before engaging in the project.

#### **DATA COLLECTION**

Two interview guides were developed and pre-tested with a patient who suffered MI and a nurse practitioner (who was not involved in the study) by the research team, based on the core components of the BACPR (2017). The interview guides are available in Appendixes 2 and 3 and were adjusted throughout the data collection process (Miles et al., 2014). The purpose of these guides was to obtain a description of patients' needs, and those perceived by health care professionals for a CRP in a remote area. Participants also completed a sociodemographic questionnaire. The individual interviews were recorded in digital format and transcribed. A logbook was kept by the first author (JB) to make sure personal beliefs did not influence the study in any way and to record emerging themes throughout the data collection process.

## DATA ANALYSIS

Qualitative data were analyzed with the content analysis method (Patton, 2015). The NVivo 12 Software was used to conduct mixed coding. Pre-determined themes were based on the BACPR model (2017), which are: 1) Health behaviour change and health education, 2) Lifestyle risk factors management, 3) Medical risk management and 4) Psychosocial health. Themes organization was improved as the data were collected and triangulation of assessments was performed (JB, ML, MEP). Sociodemographic data were subject to descriptive analysis (Gray et al., 2017).

## ETHICAL CONSIDERATIONS

Ethics approval was obtained from the ethics committee of the *Université du Québec à Chicoutimi* (602.635.01).

## RESULTS

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Seventeen patients were invited to participate in this study, sixteen that had gone through MI with PTCA participated (median age: 60 years, range 38y-79y) and one refused. One participant requested the presence of his spouse as a support during his interview, and the latter agreed to be audio recorded for the needs of the study (P8-spouse) but was not included as a participant. Among the seven health care professionals asked to participate, four family physicians agreed to take part in the study. Data collection was conducted from January to May 2019. Data were collected through semi-structured interviews for patients (home, 60 minutes) and one focus group (FG) for family physicians (FMG, 90 minutes). The first author coded all the interviews/focus group (n=17), and six interviews/focus group were coded by all the authors. Data saturation (Patton, 2015) was maintained after ten interviews.

Tables 1 and 2 present the sociodemographic characteristics of the participants. During the interviews, needs were raised by participants about each of the basic components of the BACPR model (2017). For each component, participants outlined the specific needs and services currently available.

Table 3 (Appendix 1) details the needs expressed by all participants.

## NEEDS FOR HEALTH BEHAVIOUR CHANGES AND HEALTH EDUCATION

Participants identified several needs, including those related to self-management of fatigue, information about their condition, fluctuations in heart rate, and resuming physical activity. These needs were corroborated by all patients and physicians.

Most patients mentioned the need to understand the reasons for their fatigue after their MI to find solutions for better management. They also want to learn about strategies on how to manage it:

I tire faster, I have less capacity than before [...] I'm tired, it's not normal. [...] I talked to my doctor about this and she told me: 'I know, the drugs are designed to slow you down. [...]' I think I have difficulty accepting it (P14).

Despite the fatigue reported by patients, family physicians expressed that fatigue was not systematically addressed and that they let the patient discuss it first. All patients mentioned a need to understand heartbeat fluctuations after MI:

I always went to the hospital because I didn't understand my symptoms, I was afraid and it took 10 months to find out [normal symptoms] [...], I'm afraid to walk a little, to have heart palpitations with effort. I panic and sometimes my heartbeat is low. I'm freaking out (P15).

**Table 1***Sociodemographic characteristics of the study sample (patients) (N= 16)*

Characteristics	N (%)
Sex	
Men	10 (62.5)
Women	6 (37.5)
Educational level	
Elementary school	2 (12.5)
High school	10 (62.5)
Professional training degree	1 (6.2)
College	2 (12.5)
University	1 (6.2)
Occupation	
Does not work	10 (62.5)
Full-time work	5 (31.2)
Part-time work	1 (6.2)
Marital status	
Single	5 (31.2)
Married/common law	11 (68.7)
Family income (CAD)	
29,999 and less	6 (37.5)
30,000 to 49,999	4 (25)
50,000 and more	4 (25)
Prefer not to answer	2 (12.5)
Number of Myocardial Infarction	
1	12 (75)
2	3 (18.7)
3	1 (6.2)
Other chronic health problems	
2 or less	8 (50)
3 or more	8 (50)
Physical activity	
Never	3 (18.7)
2 times / week and less	9 (56.2)
2 times / week and more	4 (25)
Tobacco	
Never	1 (6.2)
Active	6 (37.5)
Stop	9 (56.2)

Patients reported that they had not received any formal education from a family physician about heart rate fluctuations as if there is no guideline after an MI. The only follow-up is the one provided by the family physician during the appointment in FMG. Participants raised the need to know the true situation with their new heart condition and the severity of their MI:

You know you had a heart attack, but you're not really aware of the severity. You had pain

[...] but was it severe? ... the doctor told me: you had a MI almost 9-10 (very severe). I didn't think it was that bad (P11).

Despite the needs expressed by patients, some professionals perceive that they minimize the severity of their MI. "In their mind, they are okay. Even if they had an MI, it's no more serious than that" (Family physician).

**Table 2***Sociodemographic characteristics of the study sample (family physicians) (N = 4)*

Characteristics	N (%)
Sex	
Men	1 (25)
Women	3 (75)
Educational level	
Doctor of medicine	4 (100)
Masters <sup>a</sup>	1 (25)
Experience	
30 years and more	3 (75)
5 years and less	1 (25)
Experience in Family Medicine Group	
30 years and more	3 (75)
5 years and less	1 (25)
Other sectors of activity in previous work	
Emergency room	3 (75)
Hospitalization	1 (25)
Home care	3 (75)
Geriatric care	1 (25)
Private practice	1 (25)

<sup>a</sup>One participant had a master's degree in addition to a doctorate in medicine.

Patients reported that the information received on the severity of their MI was provided during their hospitalization after the PTCA. These patients mentioned that this is not the right time since they are still in shock from MI events, they need this information to be reviewed upon their return, in a more receptive state of mind: "Yes,[...] you were revived, you're medicated, you're lost, you've just come out of a big event (MI). [...] even if I see the cardiologist and he tells me things, I was so traumatized that I couldn't process anything" (P15).

In addition, family physicians believe that the lack of information perceived by patients during their PTCA in a specialized facility may be due to the high number of PTCAs performed in a given day and not enough time spent in hemodynamic centers providing this information: "What I notice is that they are not very well informed about what happens next[...], they receive little information because of the high flow (the number of interventions per day)" (Family physician).

In the absence of services to increase their knowledge about their condition, patients mentioned seeking information from their family, social, and community environment: "Sometimes I

talk to people and they explain things to me and they're not even family physician. They've had heart surgery before, and they're telling me about it. They've gained experience over several years" (P7).

#### NEEDS FOR LIFESTYLE RISK FACTOR MANAGEMENT

Participants reported four lifestyle-related needs: smoking cessation, weight management, participation in a physical activity program, and support for healthy eating. These needs were corroborated by patients and family physicians.

Patients who used tobacco raised the need for help to quit smoking and mentioned that it was difficult to cease overnight since this habit has been in place for several years: "That's what I find difficult to change, [...], when you've had this habit for more than 30 to 40 years, it's hard to change, but I'll try to get through it" (P13).

The only services received for smoking cessation assistance are the prescription of patches and chewing gums. A meeting with a nurse in a smoking cessation program is offered by the family doctor upon discharge from the hospital. Although this service is accessible and available, people do not seem to want to use it: "People don't



want to go, but they're told there's one [smoking cessation nurse]" (Family physician).

One of the needs expressed by half of the patient is that of weight management and eating habits: "I'm far from losing weight, I've gained over 20 pounds and I'm having trouble losing it" (P3).

Family physicians have recently raised the need of a nutritionist service being offered. However, it is not a common practice to refer patients if they do not express the need during medical encounters. Patients receive advice through a post-PTCA pamphlet and by seeking information in their environment and from their family physician: "We give them nutritional advice [...]" (Family physician). "Sometimes we refer them to the nutritionist if we see that they need knowledge and support at this level" (Family physician).

The needs identified about diet mainly pertained to the reduction of high-fat foods. Patients reported that they were trying to make better food choices without the support of a nutritionist: "I wish he (doctor) had given me something on what I cannot eat, but my wife and I have done it (choose the appropriate diet and avoid certain products)" (P13).

For physical activity, people raised the need to participate in a supervised and structured training program for safe physical activity resumption. They also indicated the necessity to learn about the normal physiological effects of exercise under their condition, such as shortness of breath and their heart rate. They mentioned the need to support their self-efficacy because they are afraid of having another MI during activity.

Support for physical activity would have helped for my pain, but you have nothing (services) to manage the fact that you can only do 5 or 10 minutes and there will be no danger and to be reassured about it. He (family physician) tells you to be physically active, but you have nothing (services), and you are afraid to suffer from another MI again and you are alone... (P15).

Family physicians also pointed out the lack of support when physical activity resumes and the absence of specialized physical activity professionals to develop programs: "We don't have time to write an activity program [...]"and;

"[...] anyway we don't have the training for that either" (Family physician). In the absence of this service, some patients with insurance use services from the private sector: In other situations, despite the absence of a professional in physical activity, a recommendation for light physical activity is made by family physicians: "(He said) Walk, but I wasn't referred to anyone" (P8). "The doctor told me not to shovel too much, that it wasn't good for me" (P2).

In the absence of support, people reported using different strategies to adapt to their new condition, such as limiting activities and changing their work routine: "It's like a tattoo, a scar. We know it's going to stay there" (P8). "He's more careful. He had his MI after exerting himself during intensive shovelling. He's more careful with the shovel and about not exerting himself (P8-spouse). "Before that (cardiac event) I used to give it all until I ran out of breath. We are also getting older, we have to be more careful, our capacity is decreasing" (P8).

#### **NEEDS FOR MEDICAL RISK MANAGEMENT**

People identified two needs related to the management of the medical risks of heart disease. More specifically, these needs refer to acquiring the knowledge on taking medications and their side effects.

Some of the people said they would like to know why they are taking medication because they do not think it is necessary: "He gives me medication to reduce my blood pressure, but I find my pressure's too low" (P14).

Patients mentioned that side effects should be discussed before taking drugs and that educational interventions on medication, provided by family physicians and community pharmacists, vary. Patients and family physicians corroborate these results with respect to the need for information related to medication use:

The benefits of the medication and why you're taking it. Because when you understand why you're taking this medication, it helps you to keep going. If you're not sure why you're taking it, you don't see the benefits too much (Family physician).

## NEED FOR PSYCHOSOCIAL SUPPORT

People identified four main needs related to psychological health: managing anxiety, depression, anger, fear, providing psychological support, and resuming sexual relations.

All people reported suffering from anxiety, symptoms of depression, anger, and fear. They mentioned that they cannot move on to another stage, because the MI episode still takes up all the space in their thoughts. They reported the need for psychological support when they return home: "I am more nervous and anxious than before, but this may be normal under these circumstances [post-PTCA]" (P9). "Their state of shock, because sometimes we see them like that, it all happened quickly: MI, coronary angiography, tertiary center, return[home]... they are completely disoriented" (Family physician).

Family physicians and patients mentioned that no psychological services are offered to patients and "There's no referral to a social worker for someone who has just had an [cardiac] event" (Family physician). In the absence of psychosocial services, patients reported using different strategies to deal with psychosocial problems since their MI: "I managed with my spouse as we have done for years" (P8). "My wife, daughter, and son-in-law, we sat down and we talked about it and after that things got better. I got back on track" (P4).

Patients also addressed the fear of having another MI. The answer they get from their family physician is that they can have another MI, and this, without having any control over what could happen again: "I said you're not too encouraging, I just went through an MI and you tell me I can have another one? [...] it got me a little on edge" (P3).

People stressed the need to participate in support groups with people who have had the same experience as them: "Having had support from a group of people who also have had a heart attack, being able to talk about the event and understand it and find out if others know why they had a heart attack" (P15).

In addition, some people mentioned that they were concerned about the information received by their family physician and that they were feeling that family physician trivialized their health status: "The emergency doctor told me: it took what, 40

years to clog (arteries) I can't believe you're going to clog up tomorrow morning. I took that as cash" (P8). "In Quebec City, he [family physician] told me not to worry that it would take years to clog" (P1).

People reported experiencing insecurity when sexual relations resumed. This insecurity could result from the lack of information received on the resumption of sexual activity: "You fear you can't do otherwise, are you going to have another one [MI]? I was afraid, it scared me... When you have shortness of breath like that after sex, it's scary." P8-spouse: "You get the feeling the heart is going to give out." P8

With regard to sexual relations, none of the patients received any instruction from family physician. "My god, there is no one who told me about this, I would surely have remembered if someone had told me about it" (P16). "[...] sexual relations, it's rare that they (patients) approach it right away, you have to ask them the question. We tell them (patients) you're going to be good to start again, but otherwise, patients don't talk about it [...]" (Family physician).

## DISCUSSION

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To our knowledge, this study is the first to describe the needs of patients having suffered an MI and those perceived by family physicians about a CRP in a remote area and the current services offered to patients in primary care. Results showed that patients who underwent PTCA and who live in a remote area, still have several unmet needs regarding CR. These needs revolve around: health behaviour changes and education, lifestyle risk factor management, medical risk management, and psychosocial health. In the absence of CRP, people tend to adopt healthy behaviours that allow them to embrace their condition, instead of making up for it.

### UNMET NEEDS REGARDING CARDIAC REHABILITATION

The results of this study reveal that many of people's health behaviours change and education needs remain unmet. Fatigue management was expressed by many, but not performed systematically at every medical appointment by family physicians. If fatigue after an MI was

addressed by family physicians, it would reassure patients. It would allow them to better understand it and thus know that it leads to limitations, but that with strategies, they may continue their activities as mentioned in previous studies (Blakeman & Stapleton, 2018; Fredriksson-Larsson et al., 2013; Sjöström-Strand et al., 2011). The need to acquire knowledge is unanimous among patients since they all reported wanting to know more about their condition. Our results are in line with other studies, namely that patients need to have regular follow-ups with their family physician that include learning support for resuming physical activities and for physical symptoms related to activity (Nicolai et al., 2018; Sutton et al., 2012). Studies have shown that lack of support limits the return to their usual occupations, because the fear of having a second MI or even tiring their hearts remains present, which leads them to reduce their activities (Junehag et al., 2014; Simonÿ et al., 2015).

The needs of people related to lifestyle risk factor management are also numerous. Yet these are basic needs for all people living with chronic diseases (CDs), which must be addressed during a CRP as recommended by the BACPR (2017). Despite several recommendations (Ministère de la santé et des Services sociaux, 2019; BACPR; Frohmader et al., 2017; Improving Chronic Illness Care, 2019) on the management of CDs in primary care there is no follow-ups for those who participated. The patients' needs that are the most discussed by family physicians is smoking cessation, but in a summary way. Thus, it is not high-intensity intervention to promote smoking cessation (Pagidipati et al., 2017).

Needs related to medical risk management were also raised. Acquiring knowledge about prescribed medication, the reasons for taking it and possible side effects would contribute to the quality of medication use (Huriani, 2019). Hald et al. (2019) reported that non-compliance to medication is common in people with cardiovascular diseases and that 24% of patients did not fill their prescribed medications within 7 days of discharge. Moreover, 34% of patients quit taking at least one out of two medications including aspirin, beta blocker or statin and 12% of patients quit taking all three medications which

raises their death toll. The concerns regarding the lack of knowledge of side effects may be detrimental to therapeutic adherence (Presseau et al., 2017). The compliance to medication is obvious for patients who benefit from regular follow-ups upon hospital discharge (Rahhal et al., 2020). According to our study, in order to have a successful disease self-management, patients want to be monitored to see if their lifestyle changes have a positive impact on their individual risk factors as those reported by Ghannem et al. (2005), (e.g., blood pressure, cholesterol and heart function).

This study also found that psychosocial health needs are not being met. The lack of psychosocial support for the management of psychosocial symptoms does not allow patients to increase their confidence and achieve mental balance (Ghannem et al., 2015; Simonÿ et al., 2015). All unmet needs identified in this study could be addressed using a person-centred approach through participation in a CRP (BACPR, 2017).

#### **ADAPTATION TO THE CHRONIC CONDITION RATHER THAN CARDIAC REHABILITATION**

Among other things, this study highlighted the fact that in the absence of services, people implement different strategies that focus on the problem, on emotions or on seeking social support to adapt to the disease. In light of the adaptations raised by participants, the inclusion of the development of coping skills within the health education component of CRP would be relevant to improve emotional wellbeing, functional status, and health behaviours, as suggested by Lazarus (1984). People try to live as best they can with changes in their physical and mental conditions. This adaptation was also raised in a study on health behaviours among people from rural areas in CR (Butland et al., 2019).

#### **STRENGTHS AND LIMITATIONS OF THE STUDY**

The strengths of this study include the variability of the health experience of the sample of participants interviewed. The conceptual model BACPR (2017) used allowed us to highlight CR needs, which are in line with the model's core components and are similar in our study population. The family physician's perspective on

the care needs of patients is consistent with the needs identified by patients. Despite these strengths, readers must keep in mind that those results reflect the perception of only one FMG in a remote area. The results are therefore transferable only to similar contexts (remote area), such as among people who suffered MI and underwent PTCA. Moreover, to make transferability easier, the care trajectory was detailed in a previous publication (Bernier et al., 2020). Furthermore, we cannot exclude that biases of selection and social desirability may have occurred throughout this study and may have influenced the content of the exchanges between the participants and the first author. Finally, our study failed to gather the perception of other health care professionals than family physicians, which limits our findings only to patients and family physicians.

#### **PRACTICE**

This article described the needs expressed by patients who suffered MI and underwent PTCA, but also of those perceived by family physicians regarding CRP. As results show, several needs remain unmet after a PTCA and an important lack of secondary prevention in patients with cardiovascular disease remains. In addition, this study also shows an urgent need for an interdisciplinary approach where additional care is offered along with those already provided by family physicians in FMGs away from facilities providing hemodynamic services.

#### **RESEARCH**

This project will contribute towards the advancement of knowledge in nursing regarding the needs expressed by patients living in a remote area who suffered an MI and undergone PTCA, as well as those highlighted by family physicians in FMGs. Moreover, it allowed a better understanding of patients' health behaviours, related to the way they cope with their new condition according to their experiential knowledge. The results obtained through this study will promote scientific knowledge regarding the needs following a PTCA, but also underline the lack of services available in remote locations. These results could also provide qualitative data to support the reflection on a creation of a CRP in

future studies aiming to implement and evaluate an adapted model in CR for patients enrolled in primary care clinics.

#### **CONCLUSION**

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This study showed that the needs of patients in a remote area who underwent PTCA in a specialized facility following an MI are unmet regarding CR. In the long term, unmet needs could be harmful to their health and may lead to subsequent cardiac events (Goodridge et al., 2011). In our study, we observed that only family physicians were involved in the medical care and follow-up of this heart condition. The lack of involvement of other healthcare professionals to attend to the patient is concerning and does not follow guidelines from BAPCR. Many primary healthcare clinics benefit from the on-site presence of primary care nurses who have sufficient competencies to ensure an adequate follow-up of the patient's health, including compliance to medication, blood pressure management, promotion of a healthy body mass index and total cholesterol level, smoking cessation, physical activity and healthy eating habits following a MI (Doležel & Jarošová, 2019). Lack of services is a concern, as people with chronic diseases require interdisciplinary management (Gouvernement du Québec, 2012) and the FMG structure, within which nurses work, is a model that promotes collaboration and management of people with CD. Nurses working in FMGs are mandated, among other things, to monitor people with CD, in collaboration with the family physician (Gouvernement du Québec; Ordre des infirmières et infirmiers du Québec, 2016). In a collaborative model and the absence of a CRP offered by specialists, it is fair to think that the FMG nurse could be more involved in the follow-ups of these patients. Nurses play an essential role in secondary prevention in collaboration with family physicians by raising awareness and helping people comply with treatment, as well as modifying their lifestyle habits (Poitras et al., 2018; Sjöström-Strand et al., 2013) using a person-centred approach (Barry & Edgman-Levitan, 2012), rather than by focussing on the disease. This role is in line with the

expectations of the various strategies aimed at reducing CD and also in line with the role of CD nurses who spend most of their clinical time on this issue (Huriani, 2019; Improving Chronic Illness Care, 2019; Ministère de la Santé et des Services sociaux, 2019; Ordre des infirmières et infirmiers du Québec; Poitras et al.; Santé Canada, 2007). This role must be grounded in collaborative perspective with the family physician to use everyone's skills for the benefit of the patient (Poitras et al., 2016). Nursing follow-ups would meet patients' priority needs, thus promoting better CR, and reducing the recurrence of MI (Huriani) and the feeling of vulnerability (Frohman et al., 2017).

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## Appendix 1

**Table 3**

*Perceived needs in cardiac rehabilitation*

Components	Current services	Perceived needs	Quotes
Health behaviour change and education  “Adopting healthy behaviours and education should be delivered not only to increase knowledge but more importantly to restore confidence and foster a greater sense of perceived personal control”(BACPR, 2017)	<ul style="list-style-type: none"> <li>• Meeting 1 month later with the family doctor</li> <li>• Specialist (internist)</li> <li>• Treadmill 1 month later</li> <li>• Follow-up with the family physician</li> <li>• Educational intervention: Explanatory diagram, delivery of an information booklet</li> </ul>	Self-management	“The first few months when I left the Quebec City hospital, I found it a little difficult [to take charge].” P3
		Information	“Having more information maybe it would help to be more careful and understand why I had an MI. Maybe we could be more careful, although we are careful, but we could be more careful with information and help me live.” P3 “I think education and information is our best tool.” Family physician
		Physiopathology and symptoms	“After surgery, it would have been easy to tell me: this or that can happen, but it’s like in a cocoon, he doesn’t dare talk too much, either they’re afraid you’ll react badly or they don’t want to talk at all.” P11
		True situation	“I don’t know if what I’ve been through, there are ranks in there whether it’s more dangerous, higher or lower.” P13
		Educational process: Educational method, time of teaching	“If I had information and I don’t understand it, what’s the point? But if I understood, it should be advantageous, I’m aware of that, but given my ignorance, it’s not easy to understand the doctor.” P2
		Regular follow-up with a healthcare professional	“Maybe go to the nurse, make an appointment and talk to her, yes, maybe I would know more about my future life. By chatting with her, I imagine she knows her job and she could give me advice and much more.” P3
Lifestyle risk factor management  “Supporting patient in developing self-management skills is the cornerstone of long-	<ul style="list-style-type: none"> <li>• Prescription of gum and patches</li> <li>• Recommendation s: walk, do not exert yourself, do</li> </ul>	Tobacco cessation	“I didn’t have any support because I didn’t quit with anything. In Quebec City, they wanted to give me patches, but I stopped on my own. I didn’t take anything because I was able to.” P4
		Body composition	“I’ve gained enough weight, I’ve gained 20 lbs, but I’ve reduced the amount of tobacco too.” P10
		Resuming physical activity and exercise	“Well, I’m no longer able, when I try to do something, I’ll do it, but I run out of breath.” P3

Components	Current services	Perceived needs	Quotes
term cardiovascular prevention and rehabilitation”(BACPR, 2017)	not shovel, eat better.	Healthy eating	“Food especially, less fat, less junk. That I would have been able to do. I was very careful about what I ate afterwards, but gradually it continued a little bit like before.” P8
		Continue the routine	“No, upon my return, I went back to my little routine.” P1
Medical Risk Management  “Best practice standards and guidelines for medical risk factor management (blood pressure, lipids and glucose optimization of cardioprotective therapies) and management of patients with implant devices should be used.”(BACPR, 2017)	<ul style="list-style-type: none"> <li>• Treadmill</li> <li>• Blood pressure measurement</li> <li>• Blood test</li> <li>• Regular follow-up with the doctor</li> <li>• Educational intervention: drug education</li> </ul>	Measurement (blood pressure; lipids; glucose; heart rate and rhythm)	“Well, yes, if he had told me that the heart can change, the pressure and pulse can change well, you don’t rack your brain as much. I have always been in the 125 to 85[pulse] range, but with the medication I was told it would be normal to be at 90 and 100[pulse]. When you decrease to 80[pulse], I even decreased to 76[pulse], you wonder if that’s normal? Is it normal for it to fluctuate and fall below 80? It’s the anxiety of not knowing what’s normal and not normal.” P11
		Current medication	“If they had told me that I could have side effects, at first you don’t have to worry so much and you know what to take if necessary.” P11
		Patients’ beliefs about medication	“The side effects, I wondered when I had bruises, because no one had told me anything, the rashes and itching either. You have to be careful about exposure to the sun, I wasn’t told that and I’m still out there. It seems like I’m learning a little bit all the time, it wasn’t clear from the beginning; there may be some work to be done with that.” P9
		Resuming sexual activity/function	“I didn’t get anything on that, is that dangerous?” P15
Psychosocial health  “Every patient should be screened for psychological, psychosocial and sexual health and well-being as ineffective management can lead to poor health outcomes” (BACPR, 2017)	<ul style="list-style-type: none"> <li>• Medication prescription and counseling</li> </ul>	Psychological distress (e.g. anxiety, depression, anger, fear)	“He puts me in the resuscitation room, it’s intense and it’s like a horror movie: don’t prick me with that, I don’t want to be intubated. Poor them, I’m in total panic, the fear is there. Fear, stress and anxiety are not good for the heart.” P15
		Concerns	“What I found a little difficult at first was trying to understand, but why did it happen to me? The psychological aspect, that was a blow, I found it difficult, but my daughter helped me a lot and she told me: Dad, expect it to be difficult.” P13
		Reassurance	“I said: you’re not too encouraging, I just went through one and you tell me I can have another. I tell you it got on my nerves a little bit, let’s say.” P3
		Financial support	“My God, Lord, I don’t know. Certainly, if we had had monetary support it would have helped.” P8
		Social support	“Having had group support with people who have had heart attacks and being able to talk about the event and understand. To know if others know why they had a heart attack.” P15
		Alcohol	Yes, that’s right, they didn’t do anything and I don’t understand why.” P13

## Appendix 2

### *Interview guide for primary care health professionals regarding a cardiac rehabilitation program*

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In the context of your practice in FMG, could you explain to me the situation in which you step in for the management of patients in the cardiac rehabilitation phase?

Context:

- How are you informed about patients who suffered MI?
- Time lapse for take-over;
- Functioning;
- Who are those who make the referrals?

1) For patients under your care, what are the interventions you make into the cardiac rehabilitation process?

Example: education (i.e., discussed topics), change in behaviour (i.e., what are the best approaches to promote behaviour changes « motivational interviewing »), lifestyle risk factors management, psychosocial health, managing medical risks (i.e., hypertension, glucose, lipids, medication and side effects, sexual intercourse), long-term coping strategies (i.e., in a long-term follow-up, what services do you provide to the patient...)

2) Whether it is inside or outside the FMG setting, what services do you provide in cardiac rehabilitation?

Example: joint monitoring, physiotherapist, kinesiologist, nutritionist, nurse, physician, cardiologist, social worker, psychologist; Prescription for physical activity

3) How do you think you could enhance the support you provide to people who underwent a PTCA in their CR?

Example: education, behaviour change, lifestyle risk factors management, psychosocial health, managing medical risks, long-term coping strategies

4) What do you think could be done to enhance the support offered to patients who underwent PTCA, to maintain long-term management of their disease?

Exemple: education, behaviour change, lifestyle risk factors management, psychosocial health, managing medical risks, long-term coping strategies

5) In an ideal world, which services or interventions should be offered through a CRP?

Example: physiopathology, physical activity, smoking cessation, self-management of hypertension/glucose/cholesterol, psychological and emotional health, resuming activities of daily living, sexual intercourse and sexual dysfunction.

- Should the city or other collaborators play a role in the offer of services in a CRP?

Zootherapy

6) If we were to create a CRP, how would you like to share its efficiency?

7) How would you evaluate the improvements made by patients who underwent PTCA and were enrolled in CRP?

8) Finally, is there anything you would like to add regarding the needs of patients, that we might have missed in this interview?

The interview guide was created with the core components of the operational model of the BACPR (2017).

### Appendix 3

#### *Interview guide for patients who underwent PTCA regarding a cardiac rehabilitation program*

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Before getting to the subject matter, I would appreciate if you could say a few words about you. Could you introduce yourself?

- Job, hobbies, family, etc.
- How would you describe your social and support networks?
- What does your family, or others, do to support you?

1. Could you share your experience regarding your myocardial infarction? (In what year did your MI happen?)

- What were the warning signs before you suffered a 2<sup>nd</sup> cardiac event?
- How did you describe your symptoms with your doctor? And what about your family?
- How did you deal with these symptoms when they appeared?
- If you were to have these symptoms again in the future, how would you deal with them?
- How did you experience going back home with all that involves (emotions, services, care)?
- How did you feel once you were home again (physically and emotionally)?

2. What do you know about what may trigger a myocardial infarction?

3. What do you know about a cardiac rehabilitation program?

- Were you offered to enroll in a rehabilitation program (e.g., to reduce the risk of suffering a 2<sup>nd</sup> myocardial infarction, a support for healthy eating habits, physical activity, smoking cessation, management of cholesterol and blood pressure, etc.)?

4. How could that have been helpful?

5. What are the lifestyle habits that you had to change or those you wish you had changed following your infarction?

Example: Physical activity (did you change your activities?), eating habits, weight, tobacco?

Enrollment in programs to support lifestyle changes (e.g., offered by whom, the nature of the help, how it has been helpful)?

6. What could have been helpful in order to make lifestyle changes?

- For example, how the cares, family or psychological support and community services?
- What are the interventions that were made by healthcare professionals upon discharge from hospital (e.g., physical activities, eating habits, sexual relations, etc.)?

7. How do you manage your new cardiac condition on a daily basis?

Example: to manage your hypertension, your cholesterol, your diabetes, medication uptake, HDL, lifestyle habits.

8. What would have been helpful in order to make changes in your lifestyle habits?

- Care, services, support, teachings

9. Could you explain how your mood was affected by your cardiac disease?

Example: Anxiety, depression, stressor, social support, quality of life, sexual life?

10. What could have kept you in good spirits?

11. In the future, what could help you in managing your cardiac disease in order to maintain a good health and improve the management of your disease?

12. In an ideal world, what type of support or services would you like to receive to assist you in regards to the needs related to your cardiac disease?

13. Finally, is there any other topics or needs related to your cardiac disease that you would like to talk about?

- Did you have follow-ups with a nurse?

14. How did your pharmacist deal with your cardiac condition or the medication to treat it following your MI? How does he make a difference in the managing of your cardiac condition?