The Official Journal of the Canadian Council of Cardiovascular Nurses
La revue officielle du Conseil canadien des infirmières et infirmiers en soins cardiovasculaires

Canadian Journal of Cardiovascular Nursing

Revue canadienne de soins infirmiers cardiovasculaires

VOLUME 26, ISSUE 2 • SPRING 2016
ISSN: 2368-8068 (Online)

Publication Mail Agreement #40051182

Canadian Council of Cardiovascular Nurses

Conseil canadien des infirmières et infirmiers en soins cardiovasculaires

BRILINTA DEMONSTRATED

AN IMPROVED OUTCOME IN THE COMPOSITE ENDPOINT

OF CV DEATH, MI AND STROKE VS. CLOPIDOGREL

BRILINTA significantly reduced the primary composite endpoint of CV death, MI and stroke vs. clopidogrel (9.8% vs. 11.7%, respectively; $p<0.001$) over 12 months in ACS patients (UA, NSTEMI and STEMI population). The difference in stroke alone was not significant (BRILINTA 1.3% vs. clopidogrel 1.1%; $p=0.225$).

BRILINTA REDUCED THE RISK OF CV DEATH VS. CLOPIDOGREL

BRILINTA 3.8% vs. clopidogrel 4.8% ($p=0.001$) over 12 months in ACS patients (UA, NSTEMI and STEMI population)

BRILINTA®
ticagrelor tablets

Canadian Journal of
Cardiovascular Nursing

Revue canadienne de soins infirmiers cardiovasculaires

ISSN: 2368-8068 (Online)

VOLUME 26, ISSUE 2, SPRING 2016

2 Editorial Board

ARTICLES

4 Intervention for advanced heart failure patients and their caregivers to support shared decision-making about implantation of a ventricular assist device
Marie-Andrée Gauthier, RN, MSc(c), Sylvie Cossette, RN, PhD, Marie-France Ouimette, RN, MSc, and Virginie Harris, RN, MSc

10 Development of the Prodromal Symptoms-Screening Scale (PS-SS): Preliminary Validity and Reliability
Sheila O'Keefe-McCarthy, RN, BScN, MN, PhD, CNCC(C), and Shu-Liu Guo, RN, MSn, PhD

19 The Relationship between Posttraumatic Growth and Social Support in Patients with Myocardial Infarction
Rabee Rahimi, RN, MS, Mehdi Heidarzadeh, RN, PhD, and Rahimeh Shoaee, Expert Nurse, RN

25 Exploring the Perceptions and Health Behaviours of Patients Following an Elective Ad-hoc Percutaneous Coronary Intervention: A Qualitative Study
Karen Throndson, RN, MN, Jo-Ann V. Sawatzky, RN, PhD, and Annette Schultz RN, PhD

33 Le maintien de l'activité physique après avoir participé à un programme de réadaptation cardiaque
Raphaël Mignault-Laplante, Paul-Émile Bourque, Ph.D., L.Psych., et Sarah Pakzad, Ph.D., L.Psych.

Canadian Journal of
Cardiovascular Nursing

Revue canadienne de soins
infirmiers cardiovasculaires

Address
Canadian Council of Cardiovascular Nurses
202–300 March Road,
Ottawa, Ontario K2K 2E2
Phone: 613-599-9210, Fax: 613-595-1155
Email: david@cccn.ca

For information on content, please contact:
Suzanne Fredericks, RN, PhD, Editor

For general information, please contact:
cccnmail@cccn.ca

Publishing
The *Canadian Journal of Cardiovascular Nursing* is published four times per year by the Canadian Council of Cardiovascular Nurses (CCCN).

This is a refereed journal concerned with health care issues related to cardiovascular health and illness. All manuscripts are reviewed by the editorial board and selected reviewers. Opinions expressed in published articles reflect those of the author(s) and do not necessarily reflect those of the Board of Directors of CCCN or the publisher. The information contained in this journal is believed to be accurate, but is not warranted to be so. The CCCN does not endorse any person or products advertised in this journal. Produced by Pappin Communications, Pembroke, Ontario.

Advertising
For information on advertising, please see www.cccn.ca for the rate sheet with full technical specifications.

Yearly subscription rates*

	Canada	International
Individual	$85.00	
Institution	$100.00	$125.00

If you become a member of CCCN for $85.00* (CAD) annually, you will receive your journal subscription at no additional charge.

* Plus applicable taxes

Subscriptions
Subscribe online at: www.cccn.ca

Or send cheque or money order to:
Canadian Council of Cardiovascular Nurses
202–300 March Road,
Ottawa, Ontario K2K 2E2

For general information, please contact:
david@cccn.ca

Indexing
The *Canadian Journal of Cardiovascular Nursing* is indexed in EBSCO.

ISSN: 2368-8068 (Online)

Canadian Publications Sales
Agreement No. 40051182

Canadian Council of Cardiovascular Nurses

Conseil canadien des infirmières(iers) en nursing cardiovasculaire

Call for Resolutions for the 2016 CCCN Annual General Meeting

Resolutions are invited for discussion at the 2016 annual general meeting of CCCN. Members wishing to propose a Resolution must have it typed and signed by at least two other members. If the president and the secretary agree that the Resolution is appropriate, it shall be included with the names of the mover and seconders in the agenda for the meeting. At the annual meeting, a member proposing a Resolution or the proposer's appointed representative will be asked to clarify the background to the Resolution, if necessary, and to formally move acceptance of the same.

Please submit Resolutions to CCCN by **April 29, 2016.**

Format for submitting Resolutions

The Resolution has two parts; first the 'preamble' and then the 'resolved'. Please provide the name and address of each of the individuals participating in the submission of the Resolution. The following example is provided for your guidance

Preamble—'WHEREAS' *smoking is a known risk factor related to the development and progression of cardiovascular disease;*

BE IT RESOLVED—*that no smoking be permitted in any business meeting or scientific symposia hosted by the Council.*

Submitted by:
Mover: Name _____

Address: _____

Seconder: _____

Address: _____

Seconder: _____

Address: _____

Date: April 29, 2016

CCCN Annual General Meeting

Date: Friday, May 27, 2016
Time: 15:40 – 16:40
Location: The Atlantica Hotel Halifax

Online participation in the Annual General Meeting will be available. Details on how to participate will be sent out closer to the date of the meeting.

Assemblée généralle annuelle du CCIISC

Date : le 27 mai, 2016
Heure : 15 h 40 – 16 h 40
Lieu : Atlantica Hotel Halifax

Appel de résolutions pour l'assemblée générale annuelle du CCIISC de 2016

Nous vous invitons à nous faire parvenir vos résolution pour qu'elles puissent être discutées à l'occasion de l'assemblée générale annuelle du CCIIS de 2016. Les membres qui veulent présenter une résolution doivent la faire signer par au moins deux personnes. À l'assemblée générale annuelle, les membres proposant une résolution ou leur représentant(e) seront priés de donner le contexte de la résolution et, au besoin, de présenter une motion en à bonne et due forme pour son acceptation. La présidente et la secrétaire se réservent le droit de décider du bien-fondé des résolutions proposées, compte tenu des statuts du Conseil et de tout autre élément qui risque de compromettre la validité de la résolution.

Veuillez soumettre vos résolutions au CCIISC avant le **29 avril, 2016.**

Format de présentation des resolutions

La résolution comporte deux parties, d'abord le "Préambule", puis la partie qui commence par "Il est résolu que". Veuillez fournir le nom et l'adresse de chaque personne participant à la soumission de la résolution. Voici un exemple dont vous pourrez vous inspirer :

Préambule—*Attendu que l'on sait que l'usage de la cigarette est un facteur de risque lié à l'apparition et à la progression des maladies cardio-vasculaires,*

IL EST RÉSOLU QUE—*L'usage de la cigarette sera interdit à l'occasion des réunions d'affaires et des colloques scientifiques du Conseil.*

Soumis par :
Motionnaire : Name _____

Adresse : _____

Co-motionnaire : _____

Adresse : _____

Co-motionnaire : _____

Adresse : _____

Date : le 29 avril, 2016

Intervention for advanced heart failure patients and their caregivers to support shared decision-making about implantation of a ventricular assist device

Marie-Andrée Gauthier, RN, MSc(c), Sylvie Cossette, RN, PhD, Marie-France Ouimette, RN, MSc, and Virginie Harris, RN, MSc

Abstract

This project aimed to co-develop and pilot an intervention plan to support shared decision-making (SDM) for patients considering a ventricular assist device (VAD), their caregivers and the health care team. The project involved a focus group with patients and caregivers to explore their decision-making needs along with regular participation in team meetings resulting in the creation of a decision aid. The decision aid answered needs expressed by patients and caregivers, as well as the team's initial needs for informational support, optimization of information exchange and process standardization. A workshop on SDM was also conducted to increase competence toward this approach and the use of the decision aid. This project is timely and relevant given the increase in VAD implantation in Canada. The intervention could also be applicable to other decision-making situations in which active participation can improve the quality of the decision process.

Key words: heart failure, ventricular assist device, shared decision-making, decision aid

Gauthier, M.A., Cossette, S., Ouimette, M.F., & Harris, V. (2016). Intervention for advanced heart failure patients and their caregivers to support shared decision-making about implantation of a ventricular assist device. *Canadian Journal of Cardiovascular Nursing, 26*(2), 4–9.

Article Highlights

- The offer of a VAD involves complex choices and an informed decision.
- SDM could help untangle the complexity of the decision-making process.
- Decision aid tools are among the promising interventions identified in the literature to support SDM in clinical practice.
- This project engaged active participation of patients, caregivers and health care providers to improve the quality of the decision-making process.

Introduction

Ventricular assist devices (VAD) are being offered more frequently to Canadians, as a treatment for advanced heart failure (HF). A VAD is a mechanical pump that improves ventricular function, thus allowing better tissue perfusion. This treatment generally leads to benefits such as better control of HF signs and symptoms, better quality of life, more autonomy in daily activities and improved survival rates (INESSS, 2012; Kirklin et al., 2013). Despite these potential benefits, the risks of VAD implantation are high, and the impact on daily activities is significant, thus, the decision-making process is complex and difficult (McIlvennan, Allen, Nowels, Brieke, Cleveland, & Matlock, 2014). The decision is also heavily dependent on contextual factors, including the need for someone who is willing to be a caregiver. Additionally, in the context of advanced HF, the heart's inability to pump enough blood and the resulting lack of oxygenation can impair patients' cognitive capacity, including judgment and comprehension, which might lead to a less-optimal, less-informed decision (American Heart Association, 2012). Furthermore, the offer of a VAD can occur under relatively urgent medical conditions. In such circumstances, advanced HF patients and their caregivers face the emotional decision of whether to accept the offer or decline it and continue with the illness trajectory in an end-of-life care setting.

In this context, a shared decision-making (SDM) model could help untangle the complexity of the decision-making process. SDM is the process by which patients, caregivers and health care professionals make decisions together: the patients and caregivers contributing their preferences and values, and the health professionals contributing their expertise in diagnosis, medical options, and scientific data. The goal of SDM is a high-quality decision that is made by informed patients, free of coercion, in concordance with their personal values and wishes (Sepucha et al., 2013). Promising interventions are identified in the literature to support SDM in clinical practice. Decision aid is one of them. The creation of a decision aid would help patients reflect on their treatment options according to their values and life objectives (Stacey et al., 2014).

Aim

This quality improvement project aimed to co-develop and pilot an intervention plan to support SDM when considering a VAD for patients with advanced HF, their caregivers and the health care team.

Project Preparation

The project emerged from a need expressed by clinical staff for support and tools to help nurses and providers engage VAD candidates and their caregivers in the decision-making process. The quality improvement project was endorsed by the University of Montreal Nursing Faculty Approbation Committee and the Montreal Heart Institute Director of Nursing who both supported the clinical activities and their development with a clinical nurse specialist and the clinical team.

To guide the project, an algorithm proposed by Coulter and colleagues (2013) to guide the development of decision aids was adapted. As shown in Figure 1, we began with a review of the literature followed by activities with patients and professionals to better understand their needs and co-develop the decision aid. These activities included: 1) focus groups with patients and caregivers; 2) a specific workshop with professionals on SDM, along with regular participation in team meetings to discuss specific topics related to SDM and decision aid tools; and 3) the production of a decision aid for VAD candidates and their caregivers. All activities were conducted in cooperation with either patients, caregivers and/or providers in order to optimize their involvement and the sustainability of the quality improvement project.

Summary of the Activities

Focus group

We organized two focus groups with current and past VAD carriers of the advanced HF clinic to retrospectively assess their decisional needs. General open-ended questions were outlined to guide the groups based on Krueger and Casey literature (2015) and reviewed by two expert nurses who work daily with the target clientele. The first author of the present paper was trained to moderate the focus groups. The first part of the focus group included both patients and caregivers to discuss their informational needs during pre-implantation decision-making process. For the second part, patients and caregivers were separated into two groups to allow them to express opinions or emotions they might not have wanted to share with their loved ones. All discussions were audio recorded with participants' consent. Following the groups, the main ideas were outlined around what participants knew and what they would have liked to know or known better (refer to Figure 1), thus forming insights for the future content of the decision aid. The main ideas were summarized and reviewed by expert nurses and, although participants were asked to validate a summary of the focus groups' results by mail, none of them sent feedback.

Three patients and three spouse-caregivers participated in the two focus groups and another patient was met individually because he was unable to attend the group. Three of the patients were men and two of the caregivers were women. Three out of the four patients had already received transplants—meaning their VAD had been used as a "bridge to transplant" (BTT). The other patient was living with a VAD and had decided to decline heart transplant—meaning his VAD was defined as "destination therapy" (DT).

What they knew and what they would have liked to know better can be summarized with three main ideas: understanding the life trajectory with a VAD, caregiver stress management, and accessibility of resources. Understanding the life trajectory with a VAD was identified as an important element in the decision-making process by many participants. While some participants understood the trade-off of living with a VAD, others did not realize that a change in trajectory was possible (e.g., going from a BTT to DT). One of the participants was not concerned about the uncertainty surrounding VAD implantation and saw VAD as his only treatment option. However, all participants wanted a better understanding of their life trajectory with a VAD during the decision-making process.

Caregiver stress arose for a number of reasons and, thus, requires stress management from a multidimensional approach. A dominant stress for caregivers was the feeling that they were not fully involved in the decision-making process. This was due to several reasons: caregivers were not always able to attend all of the patients' medical appointments and patients sometimes chose to withhold certain details from them, so as not to cause them more stress. Additionally, in three of the four cases, there was only a narrow window of opportunity in which patients were healthy enough to go through surgery, resulting in a shortened decision-making period and limited communication with caregivers. This situation led to stressful and difficult relationships during this period. VAD recipients need to have a good understanding of the severity of their illness in order to better prepare for the responsibilities of living with a VAD recipient was emphasized by caregivers. Therefore, attendance at medical appointments, better communication between all decision-making parties, and active participation in the decision-making process were all identified as important to help caregivers manage their stress.

Access to resources was also identified as an important issue. Finding ready access to health care providers was helpful and knowing what resources to access where was essential for patients whose time from advanced HF diagnosis to treatment decision-making was relatively short. Access to a variety of resources (e.g., books, videos, handling VAD pump) facilitated learning, and meeting with a VAD carrier was a turning point during the decision-making process. Therefore, access to a diversity of resources was included in the decision aid.

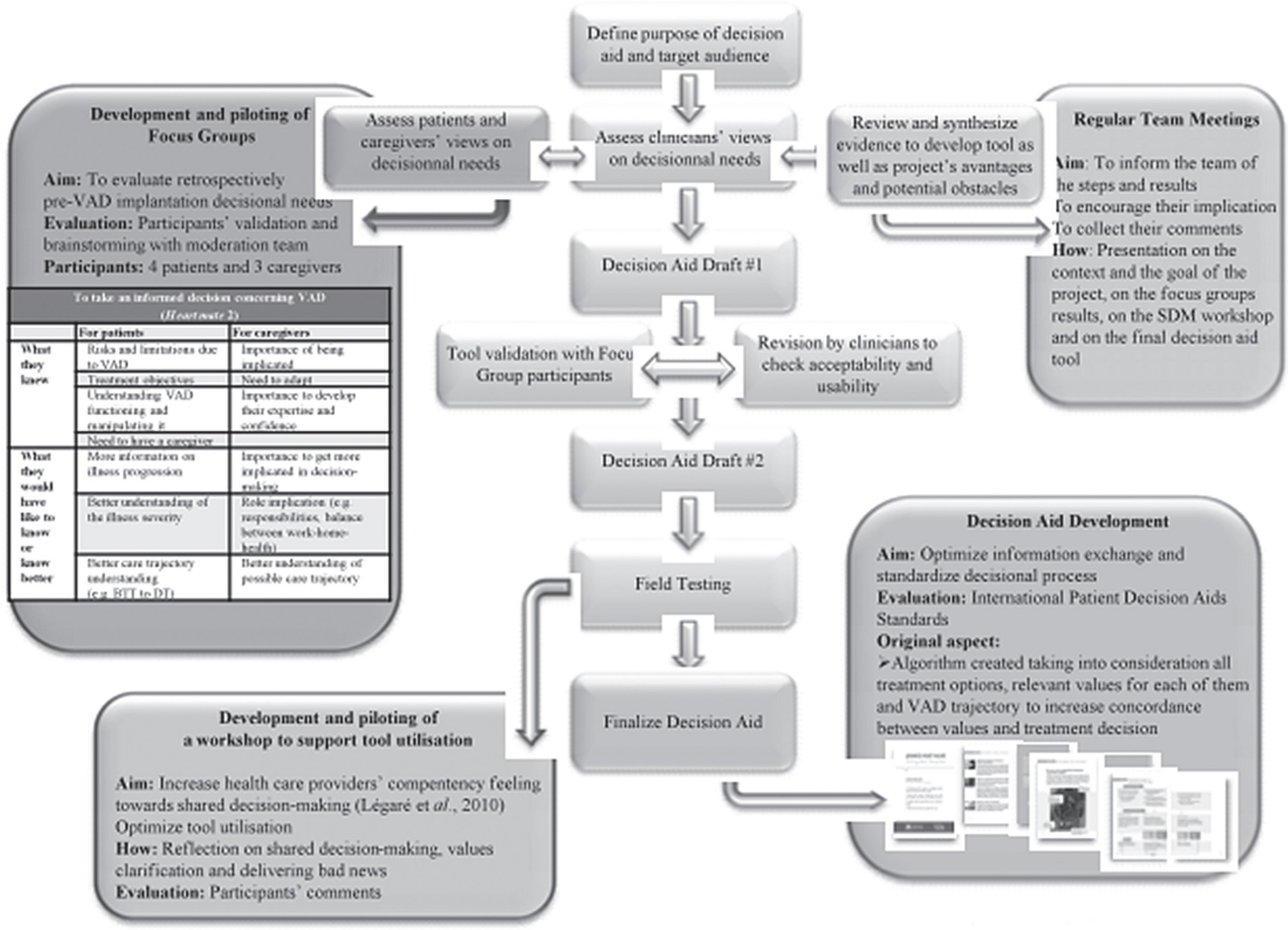

Figure 1: Project Design
Source: Inspired from Coulter et al., 2013

Professionals' SDM workshop and regular team meetings

During team meetings, the main insights that emerged from the focus groups were presented and discussed. To complete the decision aid content, the advanced HF multidisciplinary team members were invited to provide their point of view concerning their potential pre-VAD informational needs and the tool format, as well as the distribution plan of the decision aid.

A workshop on SDM was developed for health care providers, which included strategies for delivering bad news to patients and caregivers, clarification of professional values, reflection on their role and influence in SDM, as well as why, how and when to use the decision aid tool. To facilitate implementation of SDM into routine practice, clarification of the nursing role during SDM was also explored. The goal of the workshop was to increase feelings of competence to facilitate SDM and use of the decision aid in routine practice.

On one hand, regular team meetings aimed to inform and to engage with providers to ensure feasibility and sustainability of the quality improvement project. On the other, the workshop promoted SDM and better equipped the providers to obtain optimal informed consent, as well as to feel more confident in recognizing why, when and how to use the decision aid. Participants agreed that SDM should include patients and caregivers proactively and said they were aware of its benefits for all parties. A flash card was provided with the main concepts outlined in the workshop.

Decision aid tool

Patients, caregivers and health care team's decision-making needs were used to develop the content of the first draft of the decision aid tool (refer to Figure 1). Health literacy was considered to adapt the decision aid content to various levels of literacy in order to facilitate knowledge transfer and meet decision-making needs. The decision aid tool was planned for a grade six literacy level—putting essential information first, and presenting numerical information in pictograms rather than text (Agence de la santé et des services sociaux de Montréal, 2014). The decision aid was also developed by using an iterative process, which means sending it back and forth to

co-authors, focus group participants and the health care team members to ensure its relevance and completeness. The final draft was formally evaluated by all co-authors with regard to International Patient Decision Aid Standards (IPDAS). These standards include 64 established quality criteria concerning content, development process, and effectiveness of decision aids (Joseph-Williams, Elwyn & Edwards, 2014a).

Three options—VAD, heart transplantation and optimizing medical treatments—and their implication for patients (e.g., exams, surgery, medication, sexuality, etc.) were described in the decision aid. Caregivers' importance in the decision-making process and their demanding role onwards were also put in evidence in the decision aid for each option. Life trajectory was a concern for some and misunderstood by others. As a decision aid should increase consistency between values and chosen option (Stacey et al., 2014) and take into consideration VAD trajectory misunderstanding, an algorithm was developed to help patients and caregivers reflect on their values and life objectives with proposed options, their trajectory and possible outcomes. Results of the IPDAS evaluation showed that the content respected all the criteria. In terms of the development process and effectiveness, several criteria could not be met for this project, including field testing with users, and describing the quality of evidence used. Although, our final plan was to pilot the tool with VAD candidates and their caregivers, as well as to allow health care professionals to use the tool during their clinical interventions, this step has not yet been achieved because there have been no new candidates during the pilot phase of the project. Therefore this step will be carried out when possible.

Discussion

The provision of support and tools for patients, caregivers and the health care team is essential in a comprehensive decision-making process. Focus groups with patients and caregivers, a workshop on SDM and clarification of professional values, regular team meetings, and the creation of a decision aid were all thought to lead to a better decision-making experience and decision. The active participation of all parties, VAD patients, caregivers and health care providers, was essential to achieve this goal.

VAD candidates

McIlvennan, Allen, Nowels and collaborators (2014) described two different decision-making processes experienced by DT VAD candidates; one being more reflective and the other being more automatic. Reflective candidates are defined as weighing risks, benefits, and implications, whereas automatic candidates are characterized by an intuitive choice prompted by the fear of dying. These processes were also observed in our focus group findings, in which automatic decision-making might also have resulted in forgotten or misunderstood information—a possible explanation for some of the uncertainty that was noted about the life trajectory with a VAD. We also observed that, for three out of four patients, the decision-making period was abbreviated based on a narrow window of clinical stability in which to implant the VAD. This abbreviated reflection period is often complicated by patients' illness and reduced cognitive capacity, which may also explain some automatic rather than reflective decision processes. This type of decision-making process underlines health care providers' support importance. While SDM is an interprofessional responsibility, nurses have a distinct role to "facilitate [an] optimal health-related quality of life of those in their care" (Lewis, Starzomski, & Young, 2014, p. 12). Nurses need to recognize and explore patients' emotions throughout the decision-making process to help them identify their values and complement their cognitive processes (McIlvennan et al., 2015).

Caregivers

Findings from the focus groups revealed that caregivers wanted to be more involved during the decision-making process. In fact, treatment options ought to be discussed with caregivers, as their perspective is an important part of the process (McIlvennan et al., 2015). The importance of caregivers' commitment and involvement, both during decision-making and onwards, was underlined in our focus groups and has been described in other studies (McIlvennan et al., 2015; Ottenberg, Cook, Topazian, Mueller, Mueller, & Swetz, 2014). During the second part of the focus group, we separated patients from caregivers. When they were alone, caregivers opened up and spoke more freely. Some health care professionals' support interventions might be more efficient if they were done only with caregivers. A social network for caregivers to exchange and support each other could also be useful (McIlvennan et al., 2015), for example, by mentoring another caregiver or via a virtual community.

During the decision-making process, a meeting with the VAD candidate and a VAD carrier is organized. During focus groups, caregivers mentioned they would have liked to meet with a VAD carrier caregiver to help them normalize their feelings and better prepare for their new responsibilities. Therefore, meeting with another 'couple' (patient-caregiver) living with a VAD would be beneficial for both parties during decision-making. Evidence suggests that outlining caregivers' responsibilities in the SDM may help manage different option expectations (McIlvennan et al., 2015). Caregivers' involvement and role during both SDM and onwards were emphasized in our decision aid.

Health care providers

Continuity of care is important to optimize SDM (Légaré et al., 2011). Throughout the decision-making process, the same nurse and same cardiologist should follow patients and their caregivers, if possible. The same providers would ensure building of a trusting relationship, a better follow-up of data collection, and better patient-caregiver communication

concerning VAD implantation. In SDM philosophy of care, active participation is encouraged throughout the process. However, due to the complex nature of medical information about VAD implantation, VAD candidates may defer their free will to health professionals (Joseph-Williams, Elwyn, & Edwards, 2014). Their participation then becomes passive. Nurses need tools such as decision aids to foster patients and caregivers' reflection and active participation (Lewis et al., 2014).

Decision aids help to support patients in the SDM process, "but [decision aids] fail to address the essential first step of 'preparing [health care providers] for the SDM encounter' " (Joseph-Williams, Newcombe, Politi, et al., 2014, p. 307). It is, therefore, essential to educate health care providers about their role, attitudes, and impact on patients during the SDM process (Joseph-Williams, Newcombe, Politi, et al., 2014). Participative interventions such as a workshop on SDM (Müller-Engelmann et al., 2011) and clarification of providers' own values (Joseph-Williams, Newcombe, Politi, et al., 2014) were used to promote the first step of the SDM process, as well as to highlight its benefits. Additionally, to prevent resistance to change, the involvement of all stakeholders and clinicians in the process clearly facilitated the discussion and participation of the team.

Implications for practice

Assessment of possible obstacles to SDM in the clinical setting should be done on a regular basis in order to optimize the use of SDM and decision aids. Workshops on SDM and communication skills are one means of achieving this, as is the training of a decision coach, a person who is supportive, knowledgeable and provides individualized, nondirective coaching during decision-making (Stacey, Kryworuchko, Bennett, Murray, Mullan, & Légaré, 2012). New technological and medical advancements such as VAD need to be introduced in conjunction with continuing education in SDM in order to raise awareness for this clientele.

Decision aids are useful to improve the quality of the decision (Stacey et al., 2014). Due to the constant evolution of the VAD technology, informational tools should be updated on a regular basis. Observing and listening to patients and caregivers' needs during consultation will help improve decision aid and individualize care to increase decision-making quality. Moreover, decision aids should be used during a health professional consultation (Stacey et al., 2014). Our decision aid should also be skimmed through with patients and caregivers to explain treatment options available to them, as well as to answer their questions.

As the incidence of VAD implantation increases and more patients are sent home with their devices rather than staying in hospital, community and general hospital nurses are more likely to encounter VADs in clinical practice. Most VAD centres now train nurses, paramedics and first responders to deal with patients who are sent back into the community. In addition, new technological and medical advancements in this field should be part of the student nurses' education in order to raise awareness for this specific and growing clientele.

Implications for research

The tool will need further testing in other settings, as well as on a larger number of VAD candidates, caregivers and health care providers. Furthermore, limited literature has been done on decision aid with more than two options. Further inquiries should be done to measure the efficiency of this type of decision aid to validate the pertinence of showing more (or fewer) options at the same time.

Limitations

The project included only one specialized cardiac centre. Although the VAD technology is highly specialized and numbers of patients are limited, our focus groups included only a few patients and caregivers and the findings may not reflect all the needs that would have emerged from a larger sample. The homogeneity of patients, all Caucasians, may also limit transferability of the findings. Also, we interviewed patients and caregivers retrospectively. Memory can be distorted by poor health status, success of treatment, or coping strategies. However, our observations are in line with other published studies on this subject, which, therefore, supports the validity of the major deliverable of the project.

Conclusion

The goal of this project was to co-develop and pilot a project to support SDM for VAD candidates, their caregivers and the health care team. Our aim was to increase active participation and facilitate information exchange between patients, caregivers and health care providers, improve the match between personal values and choices, and standardize the decision-making process. The intervention could also be applicable to other decision-making situations to improve the quality of the decision process. This project is timely, given the increase in VAD implantation in Canada. While "the rise of machines asks us to find ways to be even more human, not less" (McIlvennan & Allen, 2014, p. 14), this remains a significant challenge. ♥

About the Authors

Marie-Andrée Gauthier, RN, MSc(c), University of Montreal

Sylvie Cossette, RN, PhD, Full Professor, University of Montreal, Researcher, Montreal Heart Institute Research Centre (MHI)

Marie-France Ouimette, RN, MSc, Coordinator of the Advanced Heart Failure Clinic, MHI

Virginie Harris, RN, MSc, Registered nurse at the Advanced Heart Failure Clinic, MHI

Address correspondence to: *Marie-Andrée Gauthier, RN, BScN, MSc (c), Montreal Heart Institute, Research Department room S-2490, 5000 rue Bélanger, Montreal, QC H1T 1C8*

Email: marie-andree.gauthier@umontreal.ca
Phone: 1-438-881-9528

Acknowledgements

We would like to thank the Montreal Heart Institute (MHI) Foundation, the MHI Research Centre, and the Ordre régional des infirmières et infirmiers de la Montérégie for their financial support. We would also like to thank the Advanced Heart Failure Clinic for its support and involvement throughout the project. A special thank you to all the patients and caregivers who shared their experiences with us to improve the overall pre-VAD experience for future candidates.

Editing support from Kate Johnson, BA, BJ.

REFERENCES

Agence de la santé et des services sociaux de Montréal. (2014). *Pour qu'on se comprenne-Guide de littératie en santé.* Retrieved from http://www.dsp.santemontreal.qc.ca/publications/publications_resume.html?tx_wfqbe_pi1%5Buid%5D=1710

American Heart Association. (2012). Decision making in advanced heart failure: A scientific statement from the American Heart Association. *Circulation, 125*, 1928–1952. doi:10.1161/CIR.0b013e31824f2173

Coulter, A., Stilwell, D., Kryworuchko, J., Mullen, P.D., Ng, C.J., & van der Weijden, T. (2013). A systematic development process for patient decision aids. *BMC Medical Informatics and Decision Making, 13*(Suppl. 2), 1–7. doi:10.1186/1472-6947-13-S2-S2

Institut national d'excellence en santé et en services sociaux (INESSS). (2012). *Évaluation des données probantes sur les dispositifs d'assistance ventriculaire gauche HeartMate II® et HeartWare® pour le traitement de l'insuffisance cardiaque chronique terminale.* Retrieved from https://www.inesss.qc.ca/fileadmin/doc/INESSS/Rapports/Cardio/ETMIS2012_Vol8_No15.pdf

Joseph-Williams, N., Elwyn, G., & Edwards, A. (2014). Knowledge is not power for patients: A systematic review and thematic synthesis of patient-reported barriers and facilitators to shared decision making. *Patient Education and Counseling, 94*, 291–309. http://dx.doi.org/10.1016/j.pec.2013.10.031

Joseph-Williams, N., Newcombe, R., Politi, M., Durand, M.-A., Sivell, S., Stacey, D., O'Connor, A., … Elwyn, G. (2014).Toward minimum standards for certifying patient decision aids: A modified delphi consensus process. *Medical Decision Making, 34,* 699–710. doi:10.1177/0272989X13501721

Kirklin, J.K., Naftel, D.C., Kormos, R.L., Stevenson, L.W., Pagani, F.D., Miller, M.A., Baldwin, T., & Young, J.B. (2013). Fifth INTERMACS annual report: Risk factor analysis from more than 6,000 mechanical circulatory support patients. *Journal of Heart and Lung Transplantation, 32,* 141–156. http://dx.doi.org/10.1016/j.healun.2012.12.004

Krueger, R.A., & Casey, M.A. (2015). *Focus Groups A Practical Guide for Applied Research* (5th ed.) Thousand Oaks, CA: Sage.

Légaré, F., Stacey, D., Pouliot, S., Gauvin, F.-P., Desroches, S., Kryworuchko, J., Dunn, S., … Graham, I.D. (2011). Interprofessionalism and shared decision-making in primary care: A stepwise approach towards a new model. *Journal of Interprofessional Care, 25*, 18–25. doi:10.3109/13561820.2010.490502

Lewis, K.B., Starzomski, R., & Young, L. (2014). A relational approach to implantable cardioverter-defibrillator generator replacement: An integrative review of the role of nursing in shared decision-making. *Canadian Journal of Cardiovascular Nursing, 24*(3), 6–14.

McIlvennan, C.K., Jones, J., Allen, L.A., Lindenfeld, J., Swetz, K.M., Nowels, C., & Matlock, D.D. (2015). Decision-making for destination therapy left ventricular assist devices—Implications for caregivers. *Circulation: Cardiovascular Quality and Outcomes, 8*, 172–178. doi:10.1161/CIRCOUTCOMES.114.001276

McIlvennan, C.K., Allen, L.A., Nowels, C., Brieke, A., Cleveland, J.C., & Matlock, D.D. (2014). Decision making for destination therapy left ventricular assist devices—"There was no choice" versus "I thought about it an awful lot". *Circulation: Cardiovascular Quality and Outcomes, 7*, 374–380. doi:10.1161/CIRCOUTCOMES.113.000729

McIlvennan, C.K., & Allen, L.A. (2014). To DT or not to DT, that is the question. Working toward a comprehensive, patient-centered perspective on left ventricular assist device for destination therapy. *Circulation: Cardiovascular Quality and Outcomes, 7*, 13–14. doi:10.1161/CIRCOUTCOMES.113.000762

Müller-Engelmann, M., Keller, H., Donner-Banzhoff, N., & Krones, T. (2010). Shared decision making in medicine: The influence of situational treatment factors. *Patient Education and Counseling, 82,* 240–246. doi:10.1016/j.pec.2010.04.028

Ottenberg, A.L., Cook, K.E., Topazian, R.J., Mueller, L.A., Mueller, P.S., & Swetz, K.M. (2014). Choices for patients "Without a Choice". Interviews with patients who received a left ventricular assist device as destination therapy. *Circulation: Cardiovascular Quality and Outcomes, 7*, 368–373. doi:10.1161/CIRCOUTCOMES.113.000660

Sepucha, K.R., Borkhoff, C.M., Lally, J., Levin, C.A., Matlock, D.D., Ng, C.J., Ropka, M.E., … Thomson, R. (2013). Establishing the effectiveness of patient decision aids: Key constructs and measurement instruments. *Bio Med Central Medical Informatics and Decision Making, 13*(Suppl. 2), 1–11. http://www.biomedcentral.com/1472-6947/13/S2/S12

Stacey D., Légaré F., Col, N.F., Bennett, C.L., Barry, M.J., Eden, K.B., Holmes-Rovner, M., … Wu, J.H.C. (2014). Decision aids for people facing health treatment or screening decisions. *Cochrane Database of Systematic Review,1*. doi:10.1002/14651858.CD001431.pub4

Stacey, D., Kryworuchko, J., Bennett, C., Murray, M.A., Mullan, S., & Légaré, F. (2012). Decision coaching to prepare patients for making health decisions: A systematic review of decision coaching in trials of patient decision aids. *Medical Decision Making, 32*, E22–E33. doi:10.1177/0272989X12443311

Development of the Prodromal Symptoms-Screening Scale (PS-SS): Preliminary Validity and Reliability

Sheila O'Keefe-McCarthy, RN, BScN, MN, PhD, CNCC(C), and Shu-Liu Guo, RN, MSn, PhD

Abstract

Every 40 seconds a person dies of cardiovascular disease. Individuals do not recognize the warning signs—prodromal symptoms—of an imminent myocardial ischemic event. The Prodromal Symptoms-Screening Scale (PS-SS) is a nine-item measure designed to evaluate PS in individuals with coronary artery disease.

Aim: *This article reports on four studies (systematic review, focus group study, content validity testing and factor analysis) that contributed to the development and psychometric examination of the PS-SS.*

Results: *PS experienced included: unusual fatigue, sleep disturbance, chest pain, anxiety, gastro-intestinal symptoms and shortness of breath. The CVI derived was 0.85. The PS-SS presented a two-factor structure pertaining to Specific Prodromal Symptoms and Non-Specific Prodromal Symptoms. Internal consistency reliability was 0.61.*

Conclusions: *The PS-SS reflects current prodromal literature, clinical practice and ACS patients' experiences of PS. Further item generation, clarity of symptom description and psychometric evaluation needs to occur prior to use in clinical practice.*

Key words: prodromal symptoms, acute coronary syndrome, psychometric testing, tool development

O'Keefe-McCarthy, S., & Guo, S.L. (2016). Development of the Prodromal Symptoms-Screening Scale (PS-SS): Preliminary Validity and Reliability. *Canadian Journal of Cardiovascular Nursing*, *26*(2), 10–18.

Article Highlights

- Prodromal Symptoms are signs of an impending myocardial ischemic event that are often not recognized by patients and clinicians.
- The Prodromal Symptoms identified by patients are: unusual aches and pains, unusual fatigue, SOB, dizziness, sleep disturbances, headaches, chest pain, gastro-intestinal symptoms, and anxiety.
- With further testing the PS-SS may be used to effectively assess PS and screen individuals at risk for CAD, individualize health education regarding risk factor modification and promote early detection of CAD with timely diagnostic investigations.

Introduction

Globally, hundreds of thousands of people seek medical attention for reports of ischemic myocardial chest pain. A considerable number experience unrecognized warning signs—prodromal symptoms—of a forthcoming acute coronary syndrome (ACS) (chest pain-unstable angina or heart attack-acute myocardial infarction). Prodromal symptoms (PS) are symptoms that may be experienced prior to a cardiac event and dissipate once the cardiac event occurs (McSweeney, Cody, O'Sullivan, Elberson, Moser, & Garvin, 2003). Prodromal warning symptoms are a common occurrence for those suffering with coronary artery disease (CAD) with prevalence ranging between 49–92% in both men and women (O'Keefe-McCarthy, & Ready, 2014). While the risk of waiting to seek emergent medical attention for signs of an ACS has been widely studied and targeted knowledge dissemination provided to the public, poor recognition of prodromal symptoms remain evident in clinical practice (Berger et al., 1999; Goldberg et al., 1998; Goldberg et al., 2002; Herlitz, Hartford, Aune, Karlsson, & Hjalmarson, 1993; Newby,1997; Newby et al., 1996; Rawles, Metcalfe, Shirreffs, Jennings, & Kenmure, 1990; World Health Organization [WHO], 2014). Although the McSweeney Acute and Prodromal Myocardial Infarction Symptom survey for women exists (which assesses 37 acute and 33 prodromal symptoms), along with the exclusion of men, its other limitation is that it takes one hour to complete and precludes effective use in clinical practice (McSweeney, O'Sullivan, Cody, & Crane, 2004). Therefore, development and testing of an instrument that is developed through a user design, that is by actual men and women afflicted with CAD, and informed by cardiovascular clinicians working daily with ACS patients, plus is further supported by current prodromal literature is more than warranted.

Aim

Therefore, the overarching aim of the four inter-related studies was to develop and preliminarily validate the Prodromal Symptom Screening Scale in a sample of ACS patients.

Literature Review

Three initial studies contributed in the development of the PS-SS. Guided by psychometric theory (Nunnally & Bernstein, 1994) and tool development design, as described by Kirshner and Guyatt (1985), we followed the processes of: 1) item development (conducting a systematic review and qualitative focus group study), 2) item clarification and reduction (conducting content validity index evaluation), and 3) initial psychometric evaluation (factor analysis). The first three studies are described in the literature review with a more detailed account of the factor analysis study to follow.

Systematic review: We conducted a systematic review of the existing prodromal literature to start an evidence-based list of potential PS experienced by men and women (O'Keefe-McCarthy & Ready, 2014). Seven studies examined PS in 6,716 individuals with confirmed CAD. Consistent prodromal symptoms reported prior to a myocardial ischemic event were: chest discomfort/pain (n=4 studies, 57%), arm pain/discomfort (n=6, 86%), jaw pain (n=3, 43%), back/shoulder blade pain (n=3, 43%), unusual fatigue (n=7, 100%), shortness of breath (n=6, 86%), sleep disturbance (n=2, 29%), dizziness (n=3, 43%), headache (n=3, 43%), anxiety (n=7, 100%) and gastro-intestinal complaints (nausea, vomiting indigestion) (n=5, 71%) (O'Keefe-McCarthy & Ready, 2014).

In order to validate data described in the literature review and further generate scale items based on ACS patients' descriptions of PS, we conducted a small focus group study (O'Keefe-McCarthy, McGillion, Nelson, Clarke, Jones, Rizza, et al., 2014). This qualitative study conducted three focus groups: one that explored patients' experiences of acute symptoms during an ACS-related emergency admission, and two of clinician's understanding of ACS-related acute symptom presentation. ACS participants were individuals who had: a) confirmation of a recent rural ED admission for ACS (i.e., within the past six months), b) recent diagnostic cardiac catheterization to confirm a diagnosis of ACS, and c) the ability to read, speak and understand English. The sample consisted of four Caucasian men with the mean age of 57 ± 2.5 years. All were married and reported that they either had high school (n=2), or college education (n=2). Three participants were retired (75%) and one was on a disability pension. The clinician sample consisted of eight registered nurses, all female. The mean age was 40.25 ± 11.39 with an average of 11.44 years experience in the ED. All eight RNs had professional certifications in advanced cardiac life support (ACLS). A more detailed description of the sample, methodology and findings is reported elsewhere (O'Keefe-McCarthy, McGillion, Nelson, Clarke, Jones, Rizza, et al., 2014). Data were analyzed using descriptive content analysis and constant comparison.

While the main aim of this study was to focus on acute symptoms of an ACS-related emergency admission, participants and clinicians, however, talked about prodromal symptoms prior to cardiac events that were somewhat different in terms of symptom occurrence, frequency and timing compared to the acute symptoms experienced. Results revealed that patients had individual and varied warning prodromal symptoms, often not recognized as cardiac in nature. For example, one 57-year-old male explained that he was having "unusual aches and pains" weeks before his heart attack. He had experienced these non-descript symptoms sporadically and it was difficult for him to determine the level of importance, as it related to his heart disease. Prodromal symptoms discussed in the focus groups involved unusual occurrences, transient frequency and a range of different intensities, and included ongoing fatigue, weakness or dizziness, chest and jaw pains, sleepless nights, shortness of breath, and escalating anxiety.

In collaboration, the principal investigator consulted with colleagues experienced with tool design, ACS symptom presentation (cardiologists, internal medicine and cardiovascular nurses) and statistical expertise. Based on data from the systematic review and qualitative focus groups, we created a draft of the PS-SS: a nine-item measure to include: unusual aches or pains, dizziness, chest pain, unusual fatigue, sleep disturbance, headaches, shortness of breath, anxiety and gastro-intestinal complaints. Included in each item were the occurrence (yes or no; scored 1 and 0); the intensity (mild, moderate or severe; scored 1,2,3); and the frequency (few times a day, daily, few times a week, weekly, or once a month; scored 5,4,3,2,1) of PS.

PS-SS item clarification and reduction occurred through content validity testing. Content validity, part of construct validity, is the degree to which the items contained in a measurement tool meet consensus from a panel of content experts (Polit & Beck, 2006). In this process, experts ranked the individual and total items contained in a scale and derived the content validity index (CVI) for each individual item and total over all scale, as described by Lynn (1986). A convenience sample of nine clinician experts in cardiovascular care, tool development and pain research were chosen to rank the PS-SS for clinical relevance (1=not relevant, 2= somewhat relevant, 3= quite relevant, and 4= extremely relevant) of the items reflecting current evidence-based literature and clinical practice. Approval for this study was provided by the Research Ethics Board at the University of Toronto. A complete outline of the methodology required to determine CVI has been described previously (O'Keefe-McCarthy, McGillion, Nelson, Clarke, McFetridge-Durdle, & Watt-Watson, 2014). The expert sample consisted of nine RNs certified nationally in cardiac critical care with a college diploma (n=5), undergraduate (n=2), or graduate level degree(s)(n=2). The mean age was 50.3 ± 3.0 years, with the mean years of clinical experience reported at 25 ± 6.53 years. Of the nine experts, the professional roles ranged from APN-clinical educator (n=1), researcher/NP (n=2), and ICU critical care RN (n=6).

All PS-SS items were ranked. The item CVIs ranged from 0.65 to 1.0. Item 9, originally gastro-intestinal complaints received and item CVI (I-CVI) of 0.65. According to Polit, Beck and Owen (2007), any I=CVI less than 0.78 indicates poor inter-rator agreement. This item was, therefore, removed and further based on general consensus achieved through the qualitative comments generated by each expert. They felt that not enough evidence supported this item and it was not verified by descriptions provided by patient representatives. It was decided in order to provide users the opportunity to fully describe their unique, subjective, prodromal symptoms, that item nine would be rewritten to include an open ended "other prodromal symptom" item question in the scale. In addition, the frequency of timing was reworded and revised to include one more temporal range, less than monthly. The revised total nine-item PS-SS CVI was computed at 0.85 an indication of strong content validity.

Study 4—Initial Psychometric Evaluation: Factor Analysis/Validation

The fourth study reports the preliminary validation of the PS-SS in a sample of adults with confirmed CAD, namely, its factor structure and reliability.

Methods

Participants completed the Prodromal Symptoms-Screening Scale as part of a prospective, descriptive-correlational, repeated-measures study. The parent study was conducted in a small-rural town emergency department (ED) in south-eastern Ontario, Canada, which examined ACS pain and anxiety and associated pain management practices and has been described in detail previously (O'Keefe-McCarthy, McGillion, Clarke, & McFetridge-Durdle, 2014). Therefore, the findings reported here contain only the cross-sectional data relevant to the evaluation of the psychometric properties of the PS-SS.

Sample

All participants eligible to participate in the psychometric assessment of the PS-SS were: 1) diagnosed with ACS (either unstable angina [UA] or Non ST-Elevation Myocardial Infarction [NSTEMI]), 2) reported prodromal symptoms, 3) reported acute chest pain for more than 20 minutes duration, and/or described anginal equivalent symptoms suggestive of ACS-related ischemia (i.e., shortness of breath [SOB], chest tightness, pressure, syncope, diaphoresis and nausea/vomiting), 4) presented with a positive electrocardiogram (ECG) changes (ST and t-wave changes) in one or more ECG leads, and 5) were cognitively intact and able to speak, read, and understand English. Patients excluded were those who: a) had ST-elevation myocardial infarction (STEMI) with a CTAS score (Canadian Triage Acuity Scale) of II-indicating emergent status and required assessment within 10 minutes of ED triage (Bulard et al., 2008), b) had recent coronary bypass grafting or heart/valve replacement (within the last two years) (which may confound the acute pain symptom presentation, should persistent post-operative pain develop post median sternotomy), and c) were unable to give a verbal and written informed consent.

This study was approved by the Research Ethics Board at the University of Toronto (protocol reference number 25999) and the community hospital's Ethics Review Committee. Eligibility was confirmed by the PI and written informed consent was obtained from each participant. Baseline, demographic data, the PS screening scale and patients' cardiac pain intensity, state and trait anxiety data were collected via patient interview by the PI.

Measure: *Prodromal Symptoms-Screening Scale*

Patients completed the PS-SS at baseline. The scale indentifies nine cardiac-related prodromal symptoms (unusual located aches/and/or pains, unusual fatigue, sleep disturbance, chest pain, anxiety, headaches, dizziness and shortness of breath). To thoroughly describe patients' unique prodromal symptoms, the category of *other symptom (item 9)* was offered to patients, in order to capture all subjective prodromal symptoms. All items were preceded by the sentence: "Before this admission to hospital for your chest pain or heart attack, did you experience pain or other symptoms such as…". For the "other PS", participants were asked, "Did you experience any other prodromal symptom not covered in the scale prior to this hospitalization for your report of chest pain?" All items were presented positively. Each symptom was recorded as a binary outcome (Yes or No and scored 1 or 0, respectively), followed by questions pertaining to symptom intensity (mild, moderate or severe; scored 1-3) and frequency (daily, few times week, once a week, two to three times per month, once a month and less than monthly; scored 6, 5, 4, 3, 2 and 1, respectively). Each prodromal symptom item was scored (minimum score = 0 and maximum score =10) and summed to produce a possible range of 0 to 90. The global scale score is achieved by summing all item sums. A higher PS-SS score indicates greater prodromal symptomology.

Statistical Analysis

All data were analyzed using SPSS software (IBM Corp., 2011). The data are presented using descriptive statistics (means, SD, or proportions). Differences of the PS-SS between age and educational level were examined by Independent t-test and One-way Analysis of Variance (One-way ANOVA). Chi-square test examined the difference between item 9 "other PS" of the PS-SS and sex. Internal structure of the PS-SS was examined by principal component factor analysis with oblique rotation (Rummel, 1970). Factors were abstracted based on two criteria: eigenvalues ≥1 and factor loading ≥ 0.3 (Rummel, 1970). Pearson's product moment correlations were used to examine the relationship between each factor and items of the PS-SS. We hypothesized that the PS-SS may have a two-factor structure, reflective of typical symptoms reported pre ACS, as well as those individual anginal equivalent symptoms suggestive of CAD (Canto et

al., 2012; Canto, Canto, & Goldberg, 2014; Devon, Ryan, & Ochs, 2008; McSweeney et al., 2003; O'Keefe-McCarthy, 2008; O'Keefe-McCarthy & Ready, 2014; Peterson, & Alexander, 1998; Stephen, Darney, & Rosenfeld, 2008).

Results

Participants

One hundred and ninety–one ACS patients were recruited for inclusion into the study from August 2011 to May 2012. One hundred and twenty ACS patients were included, 71 excluded. Twelve per cent refused and 25.2% did not meet inclusion criteria. The acceptance rate for those enrolled equalled 62.8%.

Baseline socio-demographic characteristics and clinical characteristics for all ACS patients enrolled are presented in Tables 1 and 2. The mean age of the sample was 67 years (SD= 14.1) for men and 68 years (SD=11.8) for women. There was equal representation of men and women (males, n= 62 and females, n=58); most identified themselves as Caucasian (98.3 %), married (68%) and retired (61%). Seventy-two patients had unstable angina (60%) and 40% were differentially diagnosed with Non-ST-Elevated myocardial infarction.

Table 1: Socio-demographic characteristics of patient sample (N=120)

Demographics			
Mean Age, y (SD)		67.6	(13)
		n	**%**
Gender	Female	58	48.3
	Male	62	51.7
Marital Status	Single	14	11.7
	Married	81	68.0
	Widowed	25	20.3
Employment Status	Full-time	21	17.5
	Part-time	5	4.0
	Retired	73	61.0
	Unemployed/Disability	3	2.5
	Other	18	15.0
Education	Less than High School	43	35.8
	High School	37	30.8
	College/University	40	33.4
Racial Group	Caucasian	118	98.3
	Other	2	1.7
Smoker	Never smoked	30	25.0
	Non-smoker for one year or longer	73	60.8
	Current smoker	17	14.2
ACS	Unstable Angina	72	60.0
	Non-STEMI	48	40.0

Note: ACS= Acute Coronary Syndrome, M=Mean; Other=Self-Employed, SD=Standard Deviation

Item Analysis

We computed inter-item correlations (Table 3), and item-total scale correlations (Table 4). Guided by previous recommendations for item analysis, item redundancy was defined as an inter-item correlation "r" greater than 0.45 and an item-total correlation less than 0.30 (Devillis, 1991; Rapee, Craske, Brown, & Barlow, 1996). All nine inter-item correlations ranged between r= 0.04-0.37 and, therefore, all nine items remained in the scale. The PS-SS item-total

Table 2: Pre-hospital admission profile and clinical characteristics of patient sample (N=120)

Characteristic	**Mean/ N**	**SD / %**
Pre-Admission Profile		
Worst Chest Pain Severity 2 hours pre-hospital admission *M*(SD)	6.4	2.6
Medications		
ACE inhibitor/Angiotension receptor blockers/Renin Inhibitor	61	50.8
Anticoagulant/Antiplatelets	90	75.0
Anti-arrhythmic	13	10.8
β-Blockers	70	58.3
CA/NA Channel Blockers	12	10.0
Lipid Lowering Agents	71	59.2
Diuretic	37	30.8
Analgesic/Opioids	22	18.3
Other (proton pump inhibitor, H_2 receptor antagonists, insulin/oral diabetic agents)	23	19.2
Medical History		
Diabetes	31	25.8
Hypertension	74	61.2
Heart Failure	11	9.2
COPD	28	23.3
Peptic Ulcer/Esophageal Reflux	34	28.3
Liver Disease	8	6.7
Thyroid Condition	18	15.0
Persistent Pain Syndrome	49	40.8
Hyperlipidemia	71	59.2

Note: ACE=Angiotension Converting Enzyme, ACS= Acute Coronary Syndrome, β= Beta, CA= Calcium, COPD= Chronic Obstructive Lung Disease, H_2= Histamine Parietal Cell Receptor, NA= Sodium, M= Mean, SD= Standard Deviation

Table 3: The relationship among items of the PS-SS (N=120)								
	Aches or pains	**Fatigue**	**Sleep disturbance**	**Headaches**	**Dizziness**	**Shortness of breath**	**Chest pain**	**Anxiety**
Fatigue	0.13							
Sleep disturbance	0.12	0.26**						
Headaches	0.17	0.25**	0.16					
Dizziness	0.11	0.19*	-0.04	0.12				
Shortness of breath	0.20**	0.19*	0.20**	0.15	0.23**			
Chest pain	0.24**	0.10	-0.04	0.13	0.17	0.14		
Anxiety	0.05	0.16	0.30**	0.07	0.11	0.13	0.05	
Other PS	0.15	0.21**	-0.07	0.12	0.31***	0.17	0.37***	0.04
*Note: * p≤0.05, ** p≤0.01, ***p ≤0.001*								

Table 4: Interrelationships among items and subscales of the PS-SS (*N*=120)				
Item #	**Subscale**	**Item**	**Item to total Scale correlation**	**Cronbach's Alpha if item deleted**
# 1	Factor 1	Unusual aches or pain	0.30	0.59
# 5	Factor 1	Dizziness	0.30	0.58
# 7	Factor 1	Chest pain	0.30	0.59
# 9	Factor 1	Other symptom(s)	0.33	0.58
# 2	Factor 2	Unusual Fatigue	0.38	0.56
# 3	Factor 2	Sleep disturbance	0.21	0.61
# 4	Factor 2	Headaches	0.30	0.59
# 6	Factor 2	Shortness of breath	0.36	0.57
# 8	Factor 2	Anxiety	0.22	0.61
Total Scale Cronbach's Alpha= 0.61. Factor 1= Specific Prodromal Symptoms Subscale *Factor 2= Non-Specific Prodromal Symptoms Subscale*				

correlations ranged between 0.30–0.38 except for two items; sleep disturbance and anxiety (0.21 and 0.22, respectively). These two items were retained in the scale, as prodromal anxiety and sleep disturbances are theoretically and clinically supported and directly reflect the content domain of interest (Streiner & Norman, 2008).

Factor Structure

Component factor analysis was used to investigate the factor structure of the PS-SS. Using principal components factor analysis permits summation of the observed variables, giving weight to the maximum variability and reliability to the resultant factors (Floyd & Widiman, 1995). The factors were subjected to oblique rotation because we expected that some of the items in the PS-SS may be correlated to one another. Two factors were identified. The PS-SS two-factor structure had accepted eigenvalues greater than 1 (factor 1 and 2 had eigenvalues of 2.23 and 1.41, and explained 24.7 % and 15.6% of variance, respectively, and together explained 40.4% of the variance). The Kaiser-Meyer-Olkin measure (KMO) of sampling adequacy exceeded the recommended 0.60 (an indication that the PS-SS items were appropriate for principal component factor analysis) and reported at 0.64 ($p<0.001$) (Tabachnick & Fidell, 2001). Upon further examination of the items, factor 1 included unusual aches and/or pains, dizziness, chest pain and the 'other prodromal symptoms' (item 9), with the accepted factor loading range of 0.46 to 0.77 and was labelled *Specific Prodromal Symptoms Subscale*. Factor 2 included unusual fatigue, sleep disturbance, headaches, shortness of breath, and anxiety, with the accepted factor loading range between 0.40 to 0.75 and, thus, labelled *Non-Specific Prodromal Symptoms Subscale*. See Table 5, for factor loading for forced two-factor solution with structure matrix of the PS-SS.

Reliability-Internal Consistency

Corrected item-total correlations for all nine items of the PS-SS (including the lower correlated items of sleep disturbance and anxiety, as discussed previously) were tested. Overall, the alpha estimates were all comparable to the overall alpha coefficient of 0.61 and were not increased by more than 0.05, indicating each of the items contribute similarly to measurement of prodromal symptoms (Gjeilo, Stenseth, Whaba, Lyderson, & Klepstad, 2007). The internal

Table 5: Factor loading for forced two-factor solution with Structure Matrix of the Prodromal Symptoms-Screening Scale (PS-SS, N=120)

Subscale	Item	Factor loading	
		Factor 1	Factor 2
Specific	1. Unusual aches or pain	**0.46**	0.30
Specific	5. Dizziness	**0.62**	0.18
Specific	7. Chest pain	**0.63**	0.04
Specific	9. Other prodromal symptom(s)	**0.77**	0.05
Non-Specific	2. Unusual fatigue	0.36	**0.61**
Non-Specific	3. Sleep disturbance	-0.11	**0.75**
Non-Specific	4. Headaches	0.32	**0.40**
Non-Specific	6. Shortness of Breath	0.41	**0.50**
Non-Specific	8. Anxiety	0.04	**0.60**
Pearson's Correlation Confidence was 0.44 (p<0.001) between Factor 1 and Factor 2			

consistency reliability of the total PS-SS, as measured by Cronbach's alpha was 0.61; acceptable for a newly developed instrument (Dennis & Boyce, 2004). Cronbach's alpha for Factor 1 and Factor 2 were 0.50 and 0.50, respectively (see Table 4). There was shared variance between Factor 1 subscale (*Specific Prodromal Symptoms*) and Factor 2 subscale (*Non-Specific Prodromal Symptoms*) with Pearson's Correlation Confidence computed at 0.44 (p<0.001).

The overall total scores of PS-SS were 22.6 (SD=11.5). Most participants described at least two PS prior to their cardiac event. Six participants reported experiencing no PS prior to their ischemic event. Younger adults (<65 years old: 25.9±10.7) had higher scores of PS-SS than older adults (≥65years old : 19.9±11.4; t=2.93, p=0.004). However, no significant difference was found among participants' educational level (elementary school: 22.0±12.0; high school: 22.7±11.2; college about above: 23.5±11.5; F=0.09; p>0.05) or sex (male: 22.4±11.0; female: 22.8±12.1; t=0.18; p>0.05). The majority reported they had prodromal chest pain (70.8%, Mean =5.4, SD=1.8) and SOB (61.7%, Mean=5.1, SD=1.7); headaches (25.8%, Mean =4.9, SD=1.4) and dizziness (38.3%, Mean =5.1, SD=2.1) were reported less often; see Table 6.

A breakdown of item 9 'other prodromal symptoms' reported by participants is provided in Table 7. Sixty-five participants (55%) reported 'other PS', with no significant sex difference (31 males and 34 females) using Chi-square test (p=0.88). The five most other prodromal symptoms reported were gastro-intestinal symptoms (nausea, vomiting, flatulence and heartburn, [26.1%]), diaphoresis (24.6%), numbness (tingling and burning, [18.4%]), palpitations (10.7%) and cognitive symptoms (confusion, memory loss, uncertainty, blurred vision,[9.2%]), respectively.

Table 6: The descriptive statistics of PS-SS (Mean of Total scores PS-SS=2.6, SD=11.5)

Prodromal Symptom Item (0–10)	Mean ± SD	Minimum Score	Maximum Score
Unusual ache or pain			
(Yes, N=49, 40.8%)	5.2±1.7	3	10
Fatigue			
(Yes, N=64, 53.3%)	4.7±1.3	3	10
Sleep disturbance			
(Yes, N=44, 36.7%)	5.0±1.5	3	10
Headaches			
(Yes, N=31, 25.8%)	4.9±1.4	3	8
Dizziness			
(Yes, N=46, 38.3%)	5.1±2.1	3	10
Short of breath			
(Yes, N=74, 61.7%)	5.1±1.7	3	10
Chest pain			
(Yes, N=85, 70.8%)	5.4±1.8	3	10
Anxiety			
(Yes, N=70, 58.3%)	5.1±1.5	3	10
Other prodromal symptoms			
(Yes, N=65, 54.2%)	5.4±1.7	3	10

Discussion

Four studies contributed to the development and preliminary psychometric evaluation of the Prodromal Symptom-Screening Scale. The PS-SS contains items based on scientific literature, current clinical practice and the lived experiences of those individuals with CAD. The list of symptoms generated, describe PS in terms of occurrence, intensity and frequency. Testing and revision of items through CVI evaluation derived a strong CVI value demonstrating strong validity. It appears that the PS-SS measures PS, as it pertains to *Specific and Non-Specific Prodromal Symptoms.* Reliability testing showed the internal consistency of the total PS-SS was adequate and acceptable for a newly developed tool (Dennis & Boyce, 2004; Nunnally & Bernstein, 1994).

Factor analysis with oblique rotation was used to explore the structure of the PS-SS. Analysis revealed a two-factor

Table 7: Item #9–Other Prodromal Symptoms reported by ACS patients (n=65)

Other Prodromal Symptoms	Reported by ACS participants	%
Gastro-intestinal (nausea, vomiting, flatulence, heartburn)	17	26.1
Diaphoresis	16	24.6
Numbness (tingling, burning)	12	18.4
Palpitations	7	10.7
Cognitive Symptoms (confusion, memory loss, blurred vision)	6	9.2
Weakness	3	4.6
Edema	1	0.15

structure with all factor loadings ranging from 0.40-0.77. This two-dimensional factor structure is supported by evidence from pain theory increasing our understanding of the complexities involved in the nociception of cardiac-related visceral pain. Decades of convincing evidence indicates individuals may experience specific and non-specific symptoms associated with manifestations of CAD (Bahr, Christenson, Farin, Hand, & Long, 2001; Canto, Canto & Goldberg, 2014; Canto et al., 2012; Cole et al., 2012; Devon, Ryan, Ochs, 2008; Graham, Westerhout, Kaul, Norris & Armstrong, 2008; Holfgren, Karlson & Herlitz, 1995; LØvlien, Johansson, Hole & Schei, 2009; McSweeney, 1998; McSweeney & Crane, 2000; McSweeney et al., 2013; McSweeney, Cleves, Zhao, Lefler & Yan, 2010; McSweeney et al., 2010; McSweeney et al., 2003; O'Keefe-McCarthy, 2008; O'Keefe-McCarthy & Ready, 2014; Peterson & Alexander, 1998; Stephen, Darney & Rosenfeld, 2008). Evidence indicates that ACS symptoms can occur in the absence of typical chest pain (Canto et al., 2007). For clinicians, understanding the individual mechanisms involved in the perception of cardiac pain is essential. Prodromal ischemic and/or acute myocardial symptoms of pain involve the interplay of ischemic metabolic and neuropathophysiological mechanisms that contribute to an individual's variable pain experiences (Foreman & Qin, 2009; Rosen, 2012). Cardiac science informs us that patients may, in fact, have both typical (mid sternal chest, jaw arm pain) along with dizziness, SOB, or nausea, as examples, (anginal equivalent symptoms indicative of ischemia) that reflect characteristics of myocardial ischemia. Our factor loadings were suggestive of what is reported in current prodromal literature and observed in contemporary practice. For example, prodromal symptoms of sleep disturbance, unusual fatigue, anxiety, SOB and headaches all loaded on to the extracted factor 2 non-specific PS. These are CAD-related angina equivalent symptoms. Convincing evidence also describes non-specific prodromal warning symptoms (captured by factor 2 of the PS-SS) as symptoms that are often hard to describe, elusive, vague in nature and unexpected as symptoms to be aware of as a warning sign of an impending cardiac event (Canto et al., 2012; Canto, Canto & Goldberg, 2014; Devon, Ryan, Ochs, 2008; Graham, Westerhout, Kaul, Norris & Armstrong, 2008; Holfgren, Karlson & Herlitz, 1995; Løvlien, Johansson, Hole, & Schei, 2009; McSweeney et al., 2003; O'Keefe-McCarthy, 2008; Stephen, Darney, & Rosenfeld, 2008).

Although these results potentially demonstrate that the PS-SS measures CAD-related pre-hospital symptomology, it will be important to clarify further items to add to the scale and to unpack the various "other prodromal symptoms" expressed by patients in the fourth study to provide a thorough and more comprehensive scale that measures prodromal symptoms in men and women with CAD. For instance, 26% of ACS patients reported gastro-intestinal symptoms that included nausea, vomiting, indigestion, flatulence and heartburn. Moreover, given the percentages that reported diaphoresis (24.6%), numbness (tingling and burning, [18.4%]), palpitations (10.7%) and cognitive symptoms (confusion, memory loss, blurred vision,[9.2%]), warrants further qualitative examination and scale development. Future research will also need to confirm the factor structure of the revised PS-SS in a more diverse patient sample. Moreover, further investigation of prodromal symptoms with regard to cluster analysis is warranted, as evidence has suggested that prodromal symptoms may occur in dyads (Cole et al., 2012) or are clustered together (three or more symptoms together) (Lindgren, Fukuoka, Rankin, Cooper, Carroll, & Munn, 2008; McSweeney, Cleves, Zhao, Lefler, & Yan, 2010). In addition, examination of the positive predictive value of the PS-SS on major adverse cardiac events will be warranted.

Limitations

To build upon these encouraging results, once the PS-SS is revised, it is recommended that criterion, concurrent and divergent validity, sensitivity, specificity, responsiveness and positive predictive value of the PS-SS be established through future analysis. The homogeneity of the current sample in terms of age, geographic location and limited ethnicity is a limitation and requires further analysis with a larger and more diverse patient sample.

Implications

Practice

Although results are preliminary the PS-SS has promising utility in clinical practice. Pre-emptively the PS-SS may be used to effectively assess PS and screen individuals at risk for CAD, individualize health education regarding risk factor modification and promote early detection of CAD with timely diagnostic investigations. However, the PS-SS will have to be further developed and retested for reliability and validity prior to its uptake in clinical practice.

Research

The included studies aimed at developing a scale that could evaluate prodromal symptoms in both men and women. To our knowledge, this is the first scale developed that has included PS as described by men. While our preliminary results support use of the PS-SS, further psychometric evaluation is necessary. Psychometric property assessment of the tool is necessary to further clarify wording of the items and determine inclusion and exclusion of additional scale items. Once revisions are made we will re-examine the PS-SS in terms of criterion, concurrent and divergent validity, sensitivity, specificity, test-re-test reliability, responsiveness and positive predictive value of the PS-SS. Translation into French and Chinese and other languages will also be considered as valuable future steps in the development and evaluation of the PS-SS.

Conclusion

This is the initial study to establish the preliminary psychometric properties of the PS-SS with potential utility in current clinical practice. Our analyses shows promising support for the PS-SS. However, further item generation and revision of the scale and ongoing psychometric evaluation are needed prior to releasing the PS-SS into clinical practice. ♥

About the Authors

1. Sheila O'Keefe-McCarthy, RN, BScN, MN, PhD, CNCC(C), Assistant Professor, Department of Nursing, Brock University, 1812 Sir Isaac Brock Way, St. Catharine's ON L2S 3A1.

Adjunct Scientist, Ross Memorial Hospital, Lindsay, ON

Adjunct Professor-Trent University, Peterborough, ON

2. Shu-Liu Guo, RN, MSn, PhD, Vice Director, Nursing Department, Taipei Medical University Hospital, 252, Wu Hsing St. Taipei, Taiwan, 11031

***Corresponding Author:** Sheila O'Keefe-McCarthy, RN, PhD, Assistant Professor, Department of Nursing, Brock University, 1812 Sir Isaac Brock Way, St. Catharine's ON L2S 3A1.*

T: 1-905-688-5550
Email: sokeefemccarthy@brocku.ca, celticvoice@sympatico.ca

Disclosures

Author 2 has nothing to disclose.

This author takes responsibility for the: conception, study design,(1) data collection,(1) analysis,(1,2) interpretation,(1,2) manuscript preparation,(1,2) and final approval of submitted of manuscript.(1,2)

Acknowledgements

Authors would like to thank the patients and nurses who participated in the research.

Funding

This study was supported through funding to Dr. S. O'Keefe-McCarthy by the Canadian Cardiovascular Nurse Scientists FUTURE Program (CIHR/HSFC), Canadian Pain Society (CPS) Trainee Research Grant; CPS-Nursing Education and Research Award; Registered Nurses Foundatio n of Ontario; Ontario Graduate Scholarship; Lawrence S. Bloomberg Faculty of Nursing Fellowship; Canadian Association of University Teachers- J.H. Stewart-Reid Memorial Fellowship; University of Toronto Centre for the Study of Pain-Clinical Pain Scientist Scholarship; Registered Nurses Association of Ontario-Nursing Research Interest Group-Graduate Scholarship; Royal Bank of Canada Chair in Cardiovascular Nursing–Graduate Student-Stipend-University Health Network, Toronto, Ontario, the University of Toronto-Doctoral Dissertation Completion Award and the Sigma Theta Tau International Nursing Society-Rising Stars Scholarship.

REFERENCES

Bahr, R., Christenson, R., Farin, H., Hand, M., & Long, J.M.(2001). Prodromal symptoms of acute myocardial infarction: Overview of evidence. *Md. Med,* (Suppl.), 49–59.

Berger, P.B., Ellis, S.G., Holmes, D.R. Jr., Granger, C.B., Criger, C.A., Betriu, A., ... Callis, R.M. (1999). Relationship between delay in performing direct coronary angioplasty and early clinical outcome in patients with acute myocardial infarction: Results from the global use of strategies to open occluded arteries in Acute Coronary Syndromes (GUSTO-IIb) trial. *Circulation, 100,*14–20.

Bulard, M.J., Unger, B., Spence, J., Grafstein, E., & the CTAS Working Group. (2008). Revisions to the Canadian emergency department triage and acuity scale (CTAS guidelines).*Canadian Journal of Emergency Medicine, 10*(2), 134–42.

Canto, J.G., Canto, E.,A., & Goldberg, R.J.(2014). Time to standardize and broaden the criteria of acute coronary syndrome symptom presentations in women. *Canadian Journal of Cardiology, 30*(7), 721–8. doi:10.1016/j.cjca.2013.10.015

Canto, J.G., Goldberg, R.J., Hand, M.M., Bonow, R.O., Sopko, G., Pepine, C.J., & Long, T. (2007). Symptom presentations of women with acute coronary syndrome: Myth vs reality. *Archives of Internal Medicine, 167*(22), 2405–2413. doi:10.1001/archinte.167.22.2405

Canto, J.G., Rogers, W.J., Goldberg, R.J., Peterson, E.D., Wenger, N.K., & Vaccarion, V. (2012). Association of age and sex differences in myocardial infarction symptom presentation and mortality. *Journal of the American Medical Association, 307,* 813–22.

Cole, C.S., McSweeney, J.C., Cleves, M.A., Armbya, N., Bliwise, D.L., & Petty, C.M. (2012). Sleep disturbance in women before myocardial infarction. *Heart & Lung, 45,* 438–45.

Dennis, C-L, & Boyce, P. (2004). Further psychometric testing of the of a brief personality scale to measure vulnerability to postpartum depression. *Journal of Psychosomatic Obstetrics and Gynecology, 24,* 305–311.

Devillis, R.F. (1991). *Scale Development*. Newberry, CA. Sage.

Devon, H.A., Ryan, C.J., & Ochs, A.L. (2008). Symptoms across the continuum of acute coronary syndromes: differences between men and women. *American Journal of Critical Care, 17,* 14–25.

Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment, 7*(3), 286.

Foreman, R.D., & Qin, C. (2009). Neuromodulation of cardiac pain and cerebral vasculature: Neural mechanisms. *Cleveland Clinical Journal of Medicine, 76,* S75–S79.

Gjeilo, K.H., Stenseth, R., Whaba, A., Lyderson, L., & Klepstad, P. (2007). Validation of the brief pain inventory in patients 6 months after cardiac surgery. *Journal of Symptom Pain Management, 36,* 648–56.

Goldberg, R.J., Mooradd, M., Gurwitz, J.H., Rogers, W.J., French, W.J., & Baron, H.V. (1998). Impact of time to treatment with tissue plasminogen activator on morbidity and mortality following acute myocardial infarction (the second National Registry of Myocardial Infarction). *American Journal of Cardiology, 82,* 259–64.

Goldberg, R.J., Steg, P.G., Sadiq, I., Granger, C.B., Jackson, E.A., Budaj, A., ... Goodman, S. (2002). Extent of, and factors associated with, delay to hospital presentation in patients with acute coronary syndrome (the GRACE registry). *American Journal of Cardiology,* 89, 791–96.

Graham, M.M., Westerhout, C.M., Kaul, P., Norris, C.M., & Armstrong, P.(2008). Sex differences in patients seeking medical attention for prodromal symptoms before an acute coronary event. *American Heart Journal, 158,* 1210–16.

Herlitz, J., Hartford, M., Aune, S., Karlsson, T., & Hjalmarson, A. (1993). Delay time between onset of myocardial infarction and start of thrombolysis in relation to prognosis. *Cardiology, 82,* 347–53.

Hofgren, C., Karlson, W., & Herlitz, J. (1995). Prodromal symptoms in subsets of patients hospitalized for suspected acute myocardial infarction. *Heart and Lung, 24,* 3–10.

IBM Corp. (2011). *IBM SPSS Statistics for Windows, Version 20.0*. Armonk, NY: IBM Corp.

Kirshner, B., & Guyatt, G. (1985). A methodological framework of assessing health indices. *Journal of Chronic Diseases, 38*(1), 27–36.

Lindgren, T.G., Fukuoka, Y., Rankin, S.H., Cooper, B.A., Carroll, D., & Munn, Y.L. (2008). Cluster analysis of elderly cardiac patients' pre-hospital symptomology. *Nursing Research, 57,* 14–23.

Løvlien, M., Johansson, I., Hole, T., & Schei, B. (2009). Early warning signs of an acute myocardial infarction and their influence on symptoms during the acute phase, with comparisons by gender. *Gender Medicine, 6,* 444–53.

Lynn, M. (1986). Determination and quantification of of content validity. *Nursing Research, 35*(6), 382–86.

McSweeney, J.C. (1998). Women's narratives: Evolving symptoms of myocardial infarction. *Journal of Women Aging,* 10, 67–83.

McSweeney, J.C, Cleves, M.A., Fisher, E.P., Moser, D., Wei, J., Pettey, C., … Armbya, N. (2013). Predicting coronary heart disease events in women: A longitudinal cohort study. *Journal of Cardiovascular Nursing,* 1–11. doi:10.1097/JCN.ob013e3182a409cc

McSweeney, J.C., Cleves, M.A., Zhao, W., Lefler, L.L., & Yan, S. (2010). Cluster analysis of women's prodromal and acute myocardial infarction symptoms by race and other characteristics. *Journal of Cardiovasular Nursing, 25,* 311–325.

McSweeney, J.C., Cody, M., O'Sullivan, P., Elberson, K., Moser, D., & Garvin, B. (2003). Women's early warning signs of myocardial infarction. *Circulation, 108,* 2619–23.

McSweeney, J.C. & Crane, P.B. (2000). Challenging the rules: Women's prodromal and acute symptoms of myocardial infarction. *Research in Nursing Health, 23,* 135–46.

McSweeney, J.C., O'Sullivan, P., Cleves, M.A., Lefler, L.L., Cody, M., Moser, D., … Zhao, W. (2010). Racial differences in women's prodromal and acute symptoms of myocardial infarction. *American Journal of Critical Care, 19,* 63–73. doi:10.4037/ajcc2010372

McSweeney, J.C., O'Sullivan, P., Cody, M., & Crane, P. (2004). Development of the McSweeney Acute and Prodromal Myocardial Infarction Symptom Survey. *Journal of Cardiovascular Nursing, 19*(1), 58–67.

Newby, K. (1997). Clinical outcomes according to time to treatment. *Clinical Cardiology,* 20, III11–III15.

Newby, K., Rutsch, W.R., Califf, R.M., Simoons, M,L., Aylward, P.E., Armstrong, P.W., … Van de Werf, F. (1996). Time from symptom onset to treatment and outcomes after thrombolytic therapy. GUSTO-1 Investigators. *Journal of American College of Cardiology, 27,* 1646–55.

Nunnally, J.C., & Bernstein, I.H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.

O'Keefe-McCarthy, S. (2008).Women's experiences of cardiac pain: A review of the literature. *Canadian Journal of Cardiovascular Nursing, 18,* 18–25.

O'Keefe-McCarthy, S., McGillion, M., Nelson, S., Clarke, S., McFetridge-Durdle, J., & Watt-Watson, J. (2014). Content validity of the Toronto Pain Management Inventory-Acute Coronary Syndrome Version. *Canadian Journal of Cardiovascular Nursing, 24*(2).

O'Keefe-McCarthy, S., McGillion, M., Clarke, S., & McFetridge-Durdle, J. (2014). Pain and anxiety in rural acute coronary syndrome patients awaiting diagnostic cardiac catheterization. *Journal of Cardiovasular Nursing.* Published ahead of print [PAP]. doi:10: 1097/JCN0000000000000203

O'Keefe-McCarthy, S., McGillion, M., Nelson, S., Clarke, S., Jones, J., Rizza, S., & McFetridge-Durdle, J. (2014). Acute coronary syndrome pain and anxiety in rural emergency department—Patient and nurse perspectives: A pilot focus groups study. *Canadian Journal of Nursing Research, 46*(2), 80–100.

O'Keefe-McCarthy, S., McGillion, M., Victor, J.C., Jones, J., & McFetridge-Durdle, J. (2015). Prodromal symptoms associated with acute coronary syndrome acute symptom presentation. *European Journal of Cardiovascular Nursing.* Published ahead of print [PAP]. doi:10:1177/1474515115580910

O'Keefe-McCarthy, S., & Ready, L. (2014). Impact of prodromal symptoms on future cardiac-related events: A systematic review. *Journal of Cardiovascular Nursing,* Published ahead of print [PAP]. doi:10:1097/JCN0000000000000207

Peterson, E.D., & Alexander, K.P. (1998). Learning to suspect the unexpected: evaluating women with cardiac syndromes. *American Heart Journal, 136,* 186–8.

Polit, D.F., & Beck, C.T. (2006). The content validity index: Are you sure you know what's being reported? Critique and recommendations. *Research in Nursing and Health, 29*(5), 489–497.

Polit, D.F., Beck, C.T., & Owen, S.V. (2007). Is the CVI an acceptable idicaitor of content validity? Appraisal and Recommendations. *Research in Nursing and Health, 30*(4), 459–467.

Rapee, R.M., Craske, M.G., Brown, T.A., & Barlow, D.H. (1996). Measurement of perceived controlover anxiety-related events. *Behavior Therapy, 27,* 279–293.

Rawles, J.M., Metcalfe, M.J., Shirreffs, C., Jennings, K., & Kenmure, A.C.(1990). Association of patient delay with symptoms, cardiac enzymes, and outcome in acute myocardial infarction. *European Heart Journal, 11,* 643–48.

Rosen, S.D (2012). From heart to brain: The gensis and processing of cardiac pain. *Canadian Journal of Cardiology, 28,* S7–19.

Rummel, R.J. (1970). *Applied factor analysis*. Northwestern University Press. Evanston.

Stephen, S.A., Darney, G.B., & Rosenfeld, A.G. (2008). Symptoms of acute coronary syndrome in women with diabetes: An integrative review of the literature. *Heart & Lung, 37,* 179–89.

Strickland, O. (1996). Internal consistency analysis: Making the most of what you've got. *Journal of Nursing Measurement, 4,* 3–4.

Streiner, D.L., & Norman, G.R. (2008). *Health measurement scales: A practical guide to their development and use* (4th ed.). New York: Oxford University Press.

Tabachnick, B.G., & Fidell, L.S. (2001). *Using multivariate statistics* (4th ed.). Toronto: Allyn & Bacon.

World Health Organization. (2014, May). *The 10 leading causes of death in the world, 2000 and 2011*. Retrieved from who.int/mediacentre/factsheets/fs310/en/index.html

The Relationship between Posttraumatic Growth and Social Support in Patients with Myocardial Infarction

Rabee Rahimi, RN, MS, Mehdi Heidarzadeh, RN, PhD, and Rahimeh Shoaee, Expert Nurse, RN

Abstract

The present study was conducted to examine the concept of posttraumatic growth (PTG) and its relationship with social support in patients with myocardial infarction. The study included 166 patients with myocardial infarction admitted to heart clinics in Bonab, Iran. Data were collected using the Post Traumatic Growth Inventory and the Clinical Social Support Scale. A positive, moderate relationship between social support and PTG ($p<0.001$; $r=0.361$) was found. Talking to others, providing tangible goods, and giving information about the disease may facilitate cognitive processing and adaptation, which, in turn, can lead to more PTG. Given the positive relationship between social support and PTG, nurses, families, and other sources of social support can provide emotional, instrumental and informational supports to increase positive psychological behaviours in patients with myocardial infarction.

Key words: posttraumatic growth, social support, myocardial infarction, heart disease

Rahimi, R., Heidarzadeh, M., & Shoaee, R. (2016). The Relationship between Posttraumatic Growth and Social Support in Patients with Myocardial Infarction. *Canadian Journal of Cardiovascular Nursing*, *26*(2), 19–24.

Article Highlights

- Social support, specifically emotional, instrumental and informational support, is one of the most important factors involved in increasing posttraumatic growth in individuals with the experience of clinical trauma such as myocardial infarction
- The patient's family members, friends and nurses and social organizations can help promote posttraumatic growth in these individualsby providing them with emotional, instrumental and informational support

Background

Recent studies suggest individuals who survive stressful events live to experience positive psychological changes (Ramos & Leal, 2013). Positive psychological changes, termed "posttraumatic growth (PTG)", are composed of the experience or subjective perception of positive psychological changes occurring as a result of having struggled with a stressful event (Tedeschi & Calhoun, 1996) and include the greater appreciation of life and changed sense of priorities, more intimate relationships with others, a greater sense of personal strength, spiritual development, new possibilities, and the profound sense of having found a meaning (Ramos & Leal, 2013; Tedeschi & Calhoun, 1996).

The majority of studies conducted on PTG have focused on non-clinical subjects. However, PTG can also be the focus of research on individuals experiencing chronic diseases or medical disorders. Several studies have been conducted on this subject for patients with cancer, spinal cord injury, multiple sclerosis and rheumatoid diseases (Ackroyd et al., 2011; Baglama & Atak, 2015; Dirik & Karanci, 2008; Heidarzadeh et al., 2014; Kalpakjian et al., 2014).

Myocardial infarction is a stressful event that leads to many physical, psychological and social problems for the patient (Garnefski, Kraaij, Schroevers, & Somsen, 2008; Hosseini, Ghaemian, Mehdizadeh, & Ashraf, 2014). A review of literature suggests patients encounter numerous complications, such as congestive heart failure, cardiac arrhythmia, loss of job, certain physical disabilities and mental disorders such as anxiety and depression (Hawkes et al., 2013; Hosseini, Ghaemian, Mehdizadeh, & Ashraf, 2014). Collectively, these problems can reduce their overall level of well-being and quality of life. In fact, experiencing a life-threatening condition such as myocardial infarction that occurs suddenly and unexpectedly and contains a 'death threat' can inspire growth in the positive aspects of life in the patient.

Only a few clinical studies have addressed the concept of PTG in patients after the incidence of myocardial infarction, including one that examined PTG in cardiac patients using the posttraumatic growth inventory (Sheikh, 2004) and reported the patients' growth rate as moderate. In another study, 65% of women with myocardial infarction showed positive changes after this incidence (Norekval et al., 2008). In the study by Leung et al. (2012) cardiac patients indicated some degree of posttraumatic growth, so that greater posttraumatic growth was related to greater objective risk of morbidity in them (Leung et al., 2012). However, these studies did not closely examine the different dimensions of growth identified in patients with myocardial infarction.

The present study used the cognitive processing theory of posttraumatic growth proposed by Tedeschi and Calhoun (2004) as its theoretical framework (Tedeschi & Calhoun, 2004). The cognitive process theory suggests the experience of a highly stressful life event may eliminate some key elements of the person's life goals and worldviews, as these individuals tend to automatically reflect back on the event, re-evaluate and redefine their beliefs and goals and try to find a meaning in the event itself, which eventually leads to their growth (Tedeschi & Calhoun, 2004).

According to the cognitive processing theory, one of the most important factors that associate with PTG is social support. Social support is the amount of love, attention and assistance the patient receives from his family members and friends and the other people involved in his life (Cobb, 1976). Having the social support of others can help in finding positive meanings and achieving degrees of PTG. Support can be emotional, instrumental or informational (Cobb, 1976; Schroevers, Helgeson, Sanderman, & Ranchor, 2010; Zamanzadeh, Heidarzadeh, Oshvandi, & Lakdizaji, 2007). The cognitive processing theory of PTG does not explain which type of social support (emotional, instrumental or informational) is most beneficial for the experience of PTG. In addition, there are a few studies that describe the relationship between all types of social support and PTG. In one study, Schroevers et al. (2010) suggest that getting emotional support from one's family and friends during the period following the diagnosis of cancer is an important resource for cancer survivors that helps them find positive meanings in their experience of the disease (Schroevers et al., 2010). In another study on the subject, Nenova et al. tested the hypothesis that emotional support and instrumental support explain each a unique amount of the variance in PTG in 49 distressed hematopoietic stem cell transplant (HSCT) survivors. The results of their study showed that both emotional and instrumental social supports are positively correlated with PTG (Nenova, DuHamel, Zemon, Rini, & Redd, 2013).

Purpose of the Study

Although a few studies have reported the lack of any relationships between PTG and social support (Cryder, Kilmer, Tedeschi, & Calhoun, 2006; Widows, Jacobsen, Booth-Jones, & Fields, 2005), most others (Danhauer et al., 2013; Jia, Ying, Zhou, Wu, & Lin, 2015; McDonough, Sabiston, & Wrosch, 2014; Mo, Lau, Yu, & Gu, 2014; Nenova et al., 2013; Senol-Durak & Ayvasik, 2010) have reported a significant positive relationship between social support and PTG. However, they have not paid enough attention to explaining the associations of all the different types of social support (including emotional, instrumental and informational support) with PTG, particularly in patients with myocardial infarction. The purpose of this study is to determine the relationship between social support and PTG.

Method

Design

The descriptive correlation study is part of a larger project (factors related to quality of life in patients with myocardial infarction) carried out in Islamic Azad University, Bonab branch. Convenient sampling was used to select all the patients presenting to the Heart Clinic if they met the inclusion criteria (including consent to participate in the study); so, the first author invited them to the study, briefed them on the objectives of the study, reassured them of the confidentiality of the data and obtained written consent, and then the questionnaires were filled out by the participants.

Sample

The current study population consisted of patients with myocardial infarction admitted to the heart clinic of Imam Khomeini Hospital in Bonab. The study inclusion criteria consisted of having a minimum age of 21 years (adult patients), having a definite myocardial infarction diagnosis made by a cardiologist, being willing to participate in the study, having the power to communicate and being able to answer the questions accurately (patients with severe psychological disorders or Alzheimer's were excluded), and the elapse of at least three months from the subject's incidence of myocardial infarction (it is assumed that living with MI-induced tension for at least three months can cause psychological changes in patients).

The sample size for investigating PTG was determined 100 people, using the results of previous studies, standard deviation 20, acceptable error (d = 4) with confidence interval of 95%. A total of 312 patients with myocardial infarction were admitted to the clinic over a period of 18 months. However, 124 were excluded, as they did not meet the inclusion criteria, and 166 of the remaining 188 patients (88/3%) consented to filling out the questionnaires.

Instruments

The instruments used in the present research included a demographic characteristics questionnaire, the Posttraumatic Growth Inventory (PTGI) and the Clinical Social Support Scale (CSSS). The demographic characteristics questionnaire included items such as age, gender, marital status, level of education, occupation, place of residence and duration of the disease. The PTGI was designed in 1996 by Tedeschi and Calhoun to evaluate the concept of PTG. The instrument has 21 items that determine five domains of psychological growth following a stressful event (new possibilities, relating to others, appreciation of life, personal strength and spiritual changes). This instrument is scored based on a six-point Likert scale, with the first item ("no") receiving a score of zero and the second to sixth items ("very little", "little", "moderate", "much" and "very much") receiving scores from 1 to 5; the total score obtained ranges from zero to 105 and higher scores indicate a higher PTG and lower scores a lower growth (Tedeschi & Calhoun, 1996). The PTGI had a good

Table 1: The score of posttraumatic growth and its dimensions in myocardial infarction patients

Dimension	Number of Items	Minimum Score Obtained	Maximum Score Obtained	Mean	Standard Deviation	Mean Score of Items in each Dimension
New Possibilities	5	2	25	14.98	5.39	3.00
Relating to Others	7	3	35	23.83	6.73	3.40
Personal Strength	4	1	20	12.69	4.32	3.17
Appreciation of Life	3	2	15	9.57	2.94	3.19
Spiritual Changes	2	0	10	7.33	2.27	3.66
Total Posttraumatic Growth Score	21	11	104	68.39	19.40	3.25

Table 2: The score of social support and its dimensions in myocardial infarction patients

Dimension	Number of Items	Minimum Score Obtained	Maximum Score Obtained	Mean	Standard Deviation	Mean Score of Items in each Dimension
Emotional Support	9	14	36	28.00	4.36	3.11
Instrumental Support	10	17	36	26.88	4.27	2.68
Informational Support	4	4	16	11.22	2.31	2.80
Total Social Support Score	23	40	86	66.10	9.06	2.87

overall internal consistency (α=0.95) and an acceptable internal consistency initsfive dimensions (α=0.67-0.87).

Social support was measured in the patients using the CSSS developed by Zamanzadeh et al. (2007) as the main instrument (Zamanzadeh et al., 2007). The scale items assessed social support in patients and covered different types of support originating in sources such as the family, friends, relatives, neighbours, co-workers and social support associations. The scale measured three dimensions, including emotional support (nine items), informational support (four items) and instrumental support (10 items). The items were scored based on a four-point Likert scale (a total of 23 items yielding a final score of 23 to 92). The CSSS had already been used in clinical studies conducted in Iran and had a good reliability and validity (CVR = 0/92, CVI = 0/95; α = 0/72 – 0/83 for the three dimensions, and the test-retest correlation = 0/82)(Zamanzadeh et al., 2007). The present study also found a good overall internal consistency for the scale (α=0.85) and an acceptable internal consistency for its three dimensions (α=0.82, 0.68 and 0.70).

Data analysis

The data obtained were then analyzed in SPSS-22 using descriptive statistics (mean, range and frequency) and inferential statistics (the *t*-test and Pearson's test).

Ethical considerations

The researchers obtained the ethical approval of the Ethics Committee of Islamic Azad University, Bonab branch, prior to beginning the study.

Findings

The present study analyzed the data collected from 166 patients. The mean age of participants was 55.3 ± 14.5, ranging from 21 to 90. From the total of 166 patients, 141 were men (84.9%) and 25 were women (15.1%). An average of 7.78 ± 2.75 months, ranging from three to 12 months, had elapsed from the subjects' incidence of myocardial infarction.

The findings obtained showed some degree of growth in all the patients with myocardial infarction participating in this study (100%) and reported their mean score of PTG as 68.39 ± 19.40. The highest scores obtained for the different dimensions pertained to spiritual changes, relating to others, appreciation of life, personal strength and new possibilities, in respective order (Table 1).

In relation to social support and its dimensions, the social support score was reported as 66.1 ± 9.06 and the highest score obtained for its various dimensions pertained to emotional support, informational support and instrumental support, in respective order (Table 2).

The results obtained showed a significant positive relationship between social support ($p<0.001$ and $r=0.361$) along with all of its different dimensions, including emotional support ($p<0.001$ and $r=0.346$), instrumental support ($p<0.001$ and $r=0.293$) and informational support ($p<0.005$ and $r=0.218$) and PTG. Emotional support defined PTG changes (11.97%) better than the other two dimensions. In addition, the study found a significant positive relationship between social support and dimensions and the different dimensions of PTG ($r=0.161–0.425$), with only the exception that the relationship between instrumental support and spiritual changes ($p=0.06$ and $r=0.146$) and the one between informational support and personal strength ($p=0.056$ and $r=0.148$) was not significant (Table 3). The most significant relationship of all was found between emotional support and relating to others ($r=0.425$).

Discussion

The study supports the results of previous studies (Garnefski, Kraaij, Schroevers, & Somsen, 2008; Sheikh, 2004) in that the experience of a stressful event such as myocardial infarction can have positive psychological effects. The

Table 3: The relationship of social support and its dimensions with posttraumatic growth and its dimensions in myocardial infarction patients

Variables	Total PTG	New Possibilities	Relating to Others	Personal Strength	Appreciation of Life	Spiritual Changes
Social Support	r = 0.361 p = 000	r = 0.307 p = 000	**r = 0.407** **p = 000**	r = 0.295 p = 000	r = 0.295 p = 000	r = 0.203 p = 0.009
Emotional dimension	r = 0.346 p = 000	r = 0.273 p = 000	**r = 0.425** **p = 000**	r = 0.308 p = 000	r = 0.232 p = 0.003	r = 0.161 p = 0.038
Instrumental dimension	r = 0.293 p = 000	r = 0.252 p = 0.001	r = 0.332 p = 000	r = 0.230 p = 0.003	r = 0.258 p = 0.001	**r = 0.146** **p = 0.061**
Informational dimension	r = 0.218 p = 0.005	r = 0.221 p = 0.004	r = 0.178 p = 0.021	**r = 0.148** **p = 0.056**	r = 0.238 p = 0.002	r = 0.219 p = 005

highest degree of growth in the study subjects was achieved in the dimensions of 'spiritual changes' and 'relating to others'. However, in the majority of studies conducted in other societies, lower degrees of growth were achieved in the dimension of 'spiritual changes' (Bellizzi et al., 2010; Brix et al., 2013; Hooper, Marotta, & Depuy, 2009; Lee, Luxton, Reger, & Gahm, 2010; Morris, Shakespeare-Finch, & Scott, 2012; Teodorescu et al., 2012). A study examining PTG in cancer patients in Iran found patients to have obtained the highest scores for the dimensions of 'spiritual change' and 'relating to others' (Heidarzadeh et al., 2014). As noted by Farsi et al., spirituality seems to constitute one of the main strategies for coping with stressful events in Iran (Farsi, Dehghan Nayeri, & Negarandeh, 2010; Farsi, Nayeri, & Negarandeh, 2012).

The 'relating to others' dimension was also found to grow more extensively than the other dimensions after the incidence of a life-threatening event; this finding is consistent with the findings of previous studies, which had shown that the particular social structure of Iran enables patients to receive larger amounts of positive attention from the people around them and to communicate more frequently with them in the face of problems such as the incidence of diseases (Zamanzadeh et al., 2007). The higher scores obtained for spiritual changes and relating to others appear to have contributed greatly to the higher score of PTG obtained by the participants of the present study.

In order to determine whether there is a relationship between social support and PTG, consistent with the cognitive processing theory, three different types of social support were assessed, including emotional, instrumental and informational support. A significant relationship between social support and PTG was reported; an increased social support was related to an increased PTG; and 13% of PTG changes were explained by social support. Among the different dimensions of social support and PTG, the highest correlation was found between emotional support and relating to others, which suggests that patients who talk about their experience with others and receive more support from them in the form of reassurance, sympathy and encouragement (known as emotional support), form better dyadic relationships and, therefore, report more PTG. According to the cognitive processing theory, talking to others may facilitate cognitive processing and adaptation, which then can lead to PTG. Tedeschi and Calhoun (2004) also wrote, "Those who express their problems and ask for help from others can better discover the positive aspects of their stressful event" (Tedeschi & Calhoun, 2004). Schroevers et al. (2010) wrote, "People who experience a stressful event and receive social support from people around them report to feel closer to others"(Schroevers et al., 2010).

These results show that social support is an important factor to predict PTG, but it's not the only factor in this regard. As a result, it explains only 13% of variance in patients with myocardial infarction. Other studies also found social support as a small to moderate predictor of PTG, for example, studies conducted by Schroevers et al. (2010), Nenova et al. (2013) and Yu et al. (2014) found that 8.4%, 8.8%, and 12% of the variance in PTG is defined by social support (Schroevers et al., 2010; Nenova et al., 2013; Yu et al., 2014). Although social support does not strongly predict PTG, the reported findings may be important, as they provide evidence for confirming the cognitive processing theory, which suggests that social support may be associated with PTG (Tedeschi & Calhoun, 2004).

One of the remarkable findings of the present study was the poor relationship between social support (especially instrumental support-providing tangible goods or services assistance by others) and spiritual changes, which suggests that spiritual change is independent of material and instrumental supports from the family, friends or social institutions. Most spiritual changes that occurred in the struggle with chronic diseases (Denney, Aten, & Leavell, 2011; Heidarzadeh et al., 2014) were changes that had occurred subjectively in the individual and were mostly rooted in their inner search for meaning. It is, therefore, not completely unexpected that instrumental support (rather than emotional and informational support) would have the least relationship with spiritual growth in these patients.

Another important and new finding of the present study was the positive relationship between informational support and the dimensions of PTG (except the personal strength dimension), which suggests that giving more information to the patients about the disease process and the method of controlling its progress through the nurses, physicians, families, friends and other sources might help patients with

myocardial infarction find positive changes, such as to appreciate life and embrace new possibilities, whereas none of the previous studies have reported such findings (Danhauer et al., 2013; Jia et al., 2015; McDonough et al., 2014; Mo et al., 2014; Nenova et al., 2013; Schroevers et al., 2010; Senol-Durak & Ayvasik, 2010; Yu et al., 2014).

Limitations

The limitations of the study included its use of convenience sampling, which makes the generalization of the results subject to caution. Moreover, although this study showed the relationship between social support (emotional, instrumental and information support) and PTG according to the cognitive processing theory, since it was cross-sectional in design, only the current conditions of the patients were assessed. Clinical trials should, therefore, be conducted to clarify the effects of informational support on PTG. In addition, although the Clinical Social Support Scale had a good reliability and validity, comparing the results obtained through this scale with the results obtained through other instruments in other studies is potentially an issue.

Future studies are recommended to investigate other factors affecting PTG in these patients so that plans can be made accordingly to further facilitate their growth and adaptation and improve their quality of life.

Conclusion

The present study showed that individuals who experience myocardial infarction may end up experiencing positive psychological consequences. Moreover, although this study showed a positive relationship between emotional and instrumental support in the patients examined, positive psychological changes can be predicted by giving the patients more information (informational support) and helping them cope better with their stressful conditions.

Implications for Practice

Given that emotional, instrumental and informational support are related to positive psychological changes in patients, so interventional strategies focused on providing social support are likely beneficial after incidence of myocardial infarction. There are few recommendations for preparing social support in patients with myocardial infarction. The first step to provide social support is that nurses identify support needs and resources for each patient, and define same goals for support resources (caregivers, family, friends and support communities). It is very important that nurses, as advisers, carefully listen to patient's words and new thoughts and do not reject them because, according to the cognitive processing theory, these thoughts provide the context for creating positive psychological changes in them. To increase emotional support for patients with myocardial infarction, nurses can examine patient's barriers to communication with support resources and facilitate their communication, because increased communication can have positive effects on patients' recovery process. In this regard, acquainting patients with other patients who have experienced post-traumatic growth in similar conditions can also help. The stress caused by the disease and uncertainty about the future can be controlled by informational support, i.e., by sharing appropriate information with the patients about the disease process and helping them control it and cope with stressful situations. This may lead to positive psychological changes. In addition, nurses can introduce these patients to social support institutions (the main resource for instrumental support) to reduce some of their stress sources and provide the context for post-traumatic growth in them. ♥

Acknowledgements

Hereby, the authors would like to express their gratitude to the research deputy of Islamic Azad University, Bonab branch, Imam Khomeini Hospital's Heart Clinic personnel, the university librarians and all the participating patients for their sincere assistance and cooperation.

About the Authors

Rabee Rahimi, RN, MS, Instructor in Nursing, Bonab Branch, Islamic Azad University, Bonab, Iran

Mehdi Heidarzadeh, RN, PhD, School of Nursing and Midwifery, Ardabil University of Medical Sciences, Ardabil, Iran

Rahimeh Shoaee, Expert Nurse, RN, ShahidMadani Hospital, Tabriz, Iran

***Address for correspondence:** Mehdi Heidarzadeh, RN, PhD, School of Nursing and Midwifery, Ardabil University of Medical Sciences, Ardabil, Iran.*

Phone: +984533718004
Email: ***m.mahda@gmail.com***

REFERENCES

Ackroyd, K., Fortune, D.G., Price, S., Howell, S., Sharrack, B., & Isaac, C.L. (2011). Adversarial growth in patients with multiple sclerosis and their partners: relationships with illness perceptions, disability and distress. *Journal of Clinical Psychology in Medical Settings, 18*(4), 372–379. doi:10.1007/s10880-011-9265-0

Baglama, B., & Atak, I.E. (2015). Posttraumatic growth and related factors among postoperative breast cancer patients. *Procedia-Social and Behavioral Sciences, 190*, 448–454. doi:10.1016/j.sbspro.2015.05.024

Bellizzi, K.M., Smith, A.W., Reeve, B.B., Alfano, C.M., Bernstein, L., Meeske, K., … Ballard-Barbash, R.R. (2010). Posttraumatic growth and health-related quality of life in a racially diverse cohort of breast cancer survivors. *Journal of Health Psychology, 15*(4), 615–626. doi:10.1177/1359105309356364

Brix, S.A., Bidstrup, P.E., Christensen, J., Rottmann, N., Olsen, A., Tjønneland, A., … Dalton, S. O. (2013). Post-traumatic growth among elderly women with breast cancer compared to breast

cancer-free women. *Acta Oncologica, 52*(2), 345–354. doi:10.3109/0284186X.2012.744878

Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic medicine, 38*(5), 300–314.

Cryder, C.H., Kilmer, R.P., Tedeschi, R.G., & Calhoun, L.G. (2006). An exploratory study of posttraumatic growth in children following a natural disaster. *Am J Orthopsychiatry, 76*(1), 65–69. doi:10.1037/0002-9432.76.1.65

Danhauer, S.C., Case, L.D., Tedeschi, R., Russell, G., Vishnevsky, T., Triplett, K., … Avis, N.E. (2013). Predictors of posttraumatic growth in women with breast cancer. *Psycho-Oncology, 22*(12), 2676–2683. doi:10.1002/pon.3298

Denney, R.M., Aten, J.D., & Leavell, K. (2011). Posttraumatic spiritual growth: A phenomenological study of cancer survivors. *Mental Health, Religion & Culture, 14*(4), 371–391. doi:10.1080/13674671003758667

Dirik, G., & Karanci, A.N. (2008). Variables related to posttraumatic growth in Turkish rheumatoid arthritis patients. *Journal of Clinical Psychology in Medical Settings, 15*(3), 193–203. doi:10.1007/s10880-008-9115-x

Farsi, Z., Dehghan Nayeri, N., & Negarandeh, R. (2010). Coping strategies of adults with leukemia undergoing hematopoietic stem cell transplantation in Iran: A qualitative study. *Nursing & health sciences, 12*(4), 485–492. doi:10.1111/j.1442-2018.2010.00563.x

Farsi, Z., Dehghan Nayeri, N., & Negarandeh, R. (2012). The coping process in adults with acute leukemia undergoing hematopoietic stem cell transplantation. *J Nurs Res, 20*(2), 99–109. doi:10.1097/jnr.0b013e318257b5e0

Garnefski, N., Kraaij, V., Schroevers, M., & Somsen, G. (2008). Post-traumatic growth after a myocardial infarction: A matter of personality, psychological health, or cognitive coping? *Journal of Clinical Psychology in Medical Settings, 15*(4), 270–277. doi:10.1007/s10880-008-9136-5

Hawkes, A.L., Patrao, T.A., Ware, R., Atherton, J.J., Taylor, C.B., & Oldenburg, B.F. (2013). Predictors of physical and mental health-related quality of life outcomes among myocardial infarction patients. *BMC cardiovascular disorders, 13*(1), 69. doi:10.1186/1471-2261-13-69

Heidarzadeh, M., Rassouli, M., Shahbolaghi, F.M., Majd, H.A., Karam, A.-M., Mirzaee, H., & Tahmasebi, M. (2014). Posttraumatic growth and its dimensions in patients with cancer. *Middle East Journal of Cancer, 5*(1), 23–29.

Hooper, L.M., Marotta, S.A., & Depuy, V. (2009). A confirmatory factor analytic study of the Posttraumatic Growth Inventory among a sample of racially diverse college students. *Journal of Mental Health, 18*(4), 335–343. doi:10.1080/09638230802522502

Hosseini, S.H., Ghaemian, A., Mehdizadeh, E., & Ashraf, H. (2014). Contribution of depression and anxiety to impaired quality of life in survivors of myocardial infarction. *International journal of psychiatry in clinical practice, 18*(3), 175–181. doi:10.3109/13651501.2014.940049

Jia, X., Ying, L., Zhou, X., Wu, X., & Lin, C. (2015). The effects of extraversion, social support on the posttraumatic stress disorder and posttraumatic growth of adolescent survivors of the Wenchuan Earthquake. *PloS one, 10*(3). doi:10.1371/journal.pone.0121480

Kalpakjian, C.Z., McCullumsmith, C.B., Fann, J.R., Richards, J.S., Stoelb, B.L., Heinemann, A.W., & Bombardier, C.H. (2014). Post-traumatic growth following spinal cord injury. *The journal of spinal cord medicine, 37*(2), 218–225. doi:10.1179/2045772313Y.0000000169

Kristofferzon, M.L., Löfmark, R., & Carlsson, M. (2005). Coping, social support and quality of life over time after myocardial infarction. *Journal of Advanced nursing, 52*(2), 113–124. doi:10.1111/j.1365-2648.2005.03571.x

Lee, J.A., Luxton, D.D., Reger, G.M., & Gahm, G.A. (2010). Confirmatory factor analysis of the Posttraumatic Growth Inventory with a sample of soldiers previously deployed in support of the Iraq and Afghanistan wars. *Journal of clinical psychology, 66*(7), 813–819. doi:10.1002/jclp.20692

Leung, Y.W., Alter, D.A., Prior, P.L., Stewart, D.E., Irvine, J., & Grace, S.L. (2012). Posttraumatic growth in coronary artery disease outpatients: Relationship to degree of trauma and health service use. *Journal of psychosomatic research, 72*(4), 293–299. doi:10.1016/j.jpsychores.2011.12.011

McDonough, M.H., Sabiston, C.M., & Wrosch, C. (2014). Predicting changes in posttraumatic growth and subjective well-being among breast cancer survivors: The role of social support and stress. *Psycho-Oncology, 23*(1), 114–120. doi:10.1002/pon.3380

Mo, P.K.H., Lau, J.T.F., Yu, X., & Gu, J. (2014). The role of social support on resilience, posttraumatic growth, hopelessness, and depression among children of HIV-infected parents in mainland China. *AIDS care, 26*(12), 1526–1533. doi:10.1080/09540121.2014.923810

Morris, B.A., Shakespeare-Finch, J., & Scott, J.L. (2012). Posttraumatic growth after cancer: the importance of health-related benefits and newfound compassion for others. *Supportive Care in Cancer, 20*(4), 749–756. doi:10.1007/s00520-011-1143-7

Nenova, M., DuHamel, K., Zemon, V., Rini, C., & Redd, W.H. (2013). Posttraumatic growth, social support, and social constraint in hematopoietic stem cell transplant survivors. *Psycho-Oncology, 22*(1), 195–202. doi:10.1002/pon.2073

Norekval, T.M., Moons, P., Hanestad, B.R., Nordrehaug, J.E., Wentzel-Larsen, T., & Fridlund, B. (2008). The other side of the coin: Perceived positive effects of illness in women following acute myocardial infarction. *Eur J Cardiovasc Nurs, 7*(1), 80–87. doi:10.1016/j.ejcnurse.2007.09.004

Ramos, C., & Leal, I. (2013). Posttraumatic growth in the aftermath of trauma: A literature review about related factors and application contexts. *Psychology, Community & Health, 2*(1), 43–54. doi:10.5964/pch.v2i1.39

Schroevers, M.J., Helgeson, V.S., Sanderman, R., & Ranchor, A.V. (2010). Type of social support matters for prediction of posttraumatic growth among cancer survivors. *Psycho-Oncology, 19*(1), 46–53. doi:10.1002/pon.1501

Senol-Durak, E., & Ayvasik, H.B. (2010). Factors associated with posttraumatic growth among myocardial infarction patients: Perceived social support, perception of the event and coping. *J Clin Psychol Med Settings, 17*(2), 150–158. doi:10.1007/s10880-010-9192-5

Sheikh, A.I. (2004). Posttraumatic growth in the context of heart disease. *Journal of Clinical Psychology in Medical Settings, 11*(4), 265–273.

Tedeschi, R.G., & Calhoun, L.G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of traumatic stress, 9*(3), 455–471. doi:10.1002/jts.2490090305

Tedeschi, R.G., & Calhoun, L.G. (2004). Posttraumatic growth: Conceptual foundations and empirical evidence. *Psychological Inquiry, 15*(1), 1–18. doi:10.1207/s15327965pli1501_01

Teodorescu, D.-S., Siqveland, J., Heir, T., Hauff, E., Wentzel-Larsen, T., & Lien, L. (2012). Posttraumatic growth, depressive symptoms, posttraumatic stress symptoms, post-migration stressors and quality of life in multi-traumatized psychiatric outpatients with a refugee background in Norway. *Health Qual Life Outcomes, 10*, 84. doi:10.1186/1477-7525-10-84

Widows, M.R., Jacobsen, P.B., Booth-Jones, M., & Fields, K.K. (2005). Predictors of posttraumatic growth following bone marrow transplantation for cancer. *Health Psychol, 24*(3), 266–273. doi:10.1037/0278-6133.24.3.266

Yu, Y., Peng, L., Chen, L., Long, L., He, W., Li, M., & Wang, T. (2014). Resilience and social support promote posttraumatic growth of women with infertility: The mediating role of positive coping. *Psychiatry research, 215*(2), 401–405. doi:10.1016/j.psychres.2013.10.032

Zamanzadeh, V., Heidarzadeh, M., Oshvandi, K., & Lakdizaji, S. (2007). Relationship between quality of life and social support in hemodialysis patients in Imam Khomeini and Sina educational hospitals of Tabriz University of medical sciences. *Medical Journal of Tabriz University of Medical Sciences*.

Exploring the Perceptions and Health Behaviours of Patients Following an Elective Ad-hoc Percutaneous Coronary Intervention: A Qualitative Study

Karen Throndson, RN, MN, Jo-Ann V. Sawatzky, RN, PhD, and Annette Schultz, RN, PhD

Abstract

***Background**: Elective ad-hoc percutaneous coronary interventions (PCIs) are increasingly used to manage the symptoms of coronary artery disease (CAD). However, we have limited understanding of the patients' experiences and health behaviours post-procedure.*

***Purpose**: Explore the factors that influence the perceptions and health behaviours of patients after elective ad-hoc PCI.*

***Methods**: This interpretive descriptive study used purposive sampling to recruit participants (N = 10) aged 44 to 65 years following an elective ad-hoc PCI from a cardiac catheterization laboratory at a tertiary centre in Winnipeg, MB. Participants were interviewed 11 to 35 days following their procedure. Recruitment continued until no new substantive themes emerged. The Health Belief Model provided the framework for developing, exploring, interpreting, and analyzing the data.*

***Results**: Participants expressed uncertainty about their future health and feared disease recurrence, which appeared to provide motivation for adopting a healthier lifestyle. Although two participants voiced the belief that the elective PCI cured their disease, this perception did not appear to influence their engagement in risk reduction behaviours. However, system factors such as a lack of information, direction, and/or support from health care providers appeared to play a limiting role in their ability to move forward with lifestyle change.*

***Practice implications**: Nurses have a key role in the education of patients and in providing patient-centred care that supports lifestyle change. Nurses need to develop strategies that decrease barriers to engaging in risk reduction behaviours following elective ad-hoc PCI if patients are to experience improved health and longevity.*

Key words: percutaneous coronary intervention (PCI), patient experience, health behaviours, coronary artery disease

Throndson, K., Sawatzky, J.A., & Schultz, A. (2016). Exploring the Perceptions and Health Behaviours of Patients Following an Elective Ad-hoc Percutaneous Coronary Intervention: A Qualitative Study. *Canadian Journal of Cardiovascular Nursing*, *26*(2), 25–33.

Article Highlights

- The belief of cure is not a barrier to lifestyle change; other factors influence the adoption of risk reduction behaviours such as lack of knowledge regarding risk factors, and lack of health care system support.
- Health care professionals have an opportunity to capitalize on the post-PCI patients' early motivation to adopt healthier lifestyles through health education and promotion of prevention strategies.
- The adoption of patient-centred follow-up through phone consultation would support the patient's learning/information needs while still optimizing service delivery in the cardiac catheterization laboratory and short-stay cardiac unit.

Percutaneous coronary interventions (PCIs) have exploded into the treatment armament of cardiologists, as a minimally invasive treatment for symptoms associated with coronary artery disease (CAD). PCI procedures have grown exponentially and surpass coronary artery bypass graft (CABG) surgeries as the treatment of choice for many patients with CAD (Hassan et al., 2010; Mack et al., 2008). An array of PCI procedures is currently at the cardiologists' disposal, one of which is the elective PCI procedure. Contemporary elective PCI procedures are characterized by innovative devices, short hospital stays, and ad-hoc treatments. Ad-hoc elective PCI procedures are distinguished by diagnosis of CAD followed immediately by treatment (PCI). Angus et al. (2005) found that an important process in a patient's comprehension of a disease threat is to link the symptoms along the stages of the diagnosis and "it is the understanding of this link that makes the diagnosis believable to him" (p. 2124). The rapid transition from diagnosis to treatment results in minimal time for the ad-hoc PCI patient to process the ramifications of their diagnosis. In Winnipeg, MB, 82% of the elective PCI patients have an ad-hoc procedure (M. Kuppe, personal communication, December 9, 2015). Similar trends are reported in other North American Centres (Gilchrist, 2014; Lauck, Johnson, & Ratner, 2009). Reported concerns related to ad-hoc treatments are patients have limited time to process their diagnosis and shortened hospital stays that allow fewer opportunities for information exchange with health care providers (Astin, Closs, McLenachan, Hunter, & Priestly, 2009; Radcliffe, Harding, Rothman, & Feder, 2009). Reid et al. (2006) describes PCI patients as having a 'drive-through' mentality to CAD treatment, which they contend results in a lack of motivation

for sustained lifestyle change. However, a "drive-through" description may also be a reflection of a health care system that has responded to the increased demand for elective PCI services without the supporting research evidence on how best to meet the needs of these patients (Lauck et al., 2009).

Current evidence suggests that elective PCI patients lack understanding of cardiac risk factors (Astin & Jones, 2004; Campbell & Torrance, 2005; Fernandez, Griffiths, Juergens, Davidson, & Salamonson, 2006; Fernandez, Salamonson, Griffiths, Juergens, & Davidson, 2008; Lauck, et al., 2009; Ozkan, Odabasi, & Ozcan, 2008; Tchicaya et al., 2012), hold the erroneous belief that they are cured (Campbell & Torrance, 2005; Eastwood, 2001; Hasankhani, et al., 2014; Peterson, et al., 2010), and fail to initiate lifestyle changes (Astin & Jones, 2006; Cronin, Freeman, Ryan, & Drake, 2000; Fernandez et al., 2006; Fernandez et al., 2008). Researchers have hypothesized that the belief of cure may be a contributing factor to elective PCI patients' low enrolment and limited participation in secondary prevention strategies (Campbell & Torrance, 2005; Cronin et al., 2000; Eastwood, 2001; Fernandez et al., 2006). Thus, the treatment benefits afforded by elective ad-hoc PCI may be minimized or lost if patients' do not adopt risk reduction behaviours because they do not understand their risk factors and fail to comprehend the health threat.

Effective CAD management requires the use of current medical technologies in conjunction with evidence-based prevention strategies. To date, the primary modes of secondary prevention for cardiac patients are cardiac rehabilitation programs (CRPs). While substantive research evidence validates the benefit of secondary preventions programs for PCI patients (Dendale et al., 2005; Goel, Lennon, Tilbury, Squires, & Thomas, 2011, Higgins, Hayes, & McKenna, 2001; Lisspers et al., 2005; Schwaab, Waldmann, Katalinic, Sheikhzadeh, & Raspe, 2011; Williams et al., 2006), evidence also suggests that elective PCI patients fail to enrol in traditional CRPs (Aragam et al., 2011; Bethell et al., 2008; Bethell, Evans, Turner, & Lewin, 2006; Khattab et al., 2012; Lauck et al., 2009; Worcester, Murphy, Mee, Roberts, & Goble, 2004). For example, in a descriptive survey of elective PCI patients (N = 98), Lauck and associates (2009) found that 77% of the participants did not plan on attending CRP.

Alternative prevention strategies targeted towards elective PCI patients' needs requires increased attention, as elective PCI patients often have normal ejection fractions and fewer vessels affected by CAD (Lisspers et al., 1999; Mack et al., 2008; Peterson et al., 2010). Thus, these patients are often diagnosed and treated in the earlier stages of CAD, which makes them ideal targets for health behaviour changes that can alter their disease trajectory. The elective ad-hoc PCI patient's ability to adopt healthy lifestyle behaviours has significant implications for their health. The non-urgent nature and seemingly stable disease condition has contributed to a lack of focus on this population, resulting in their needs being greatly overshadowed by those of the more acute cardiac patients.

Becker's (1974) Health Belief Model (HBM) provided the framework to explore the factors that influenced the health behaviour practices of elective ad-hoc PCI patients. Three of the study's objectives will be discussed in this manuscript and include: a) to understand the patients' perceptions of the ad-hoc PCI experience and their beliefs regarding the perceived threat of CAD, b) to identify the factors that underlie the perceived belief that one is cured, c) and finally, to understand the rationale for their health behaviour practices. Health care providers require a better understanding of the patient's perspective to help them live longer and better, and to provide patient-centred strategies that are tailored to fit the learning and lifestyle needs of this cardiac population.

Methods

Study Design and Setting

An interpretive descriptive qualitative approach was used to explore the experiences of first-time elective ad-hoc PCI patients. The setting of this study included the cardiac catheterization laboratory and cardiac short stay unit at a large tertiary hospital in Winnipeg, MB. During the study period, elective ad-hoc patients were routinely discharged the morning following their PCI procedure, unless significant complications arose. The author is the Primary Investigator (PI) and a former employee of the cardiac catheterization laboratory. The author's interest in the elective ad-hoc PCI patient's perspective grew from her clinical practice and provided the focus for this master's thesis. Ethics approval was obtained from the Education and Nursing Research Ethics Board at the University of Manitoba and access approval was obtained from the participating site.

Study Participants and Procedures

Purposive sampling was used to recruit participants with diverse experiences and backgrounds. Patients who had undergone an elective ad-hoc PCI and were discharged the following day were eligible to participate. Inclusion criteria for study eligibility was also determined by ability to speak and understand English, new diagnosis of CAD, between 18–65 years of age, ability to provide consent, no prior attendance in CRP, no significant psychiatric history or cognitive impairment, and no severe co-morbidity (e.g., cancer or heart failure).

The staff of the cardiac catheterization laboratory identified eligible patients based on the above criteria and provided them with a study information package including a letter briefly explaining the study and contact information for the PI. Patients interested in participating in the study contacted the PI directly. Informed consent was obtained prior to the interviews. Recruitment and interviews took place concurrently with data analysis until no new substantive themes emerged.

Ten of the 14 eligible participants were interviewed. Eight participants were male (mean age 56.4 years) and two were female (mean age 64 years). The predominance of male

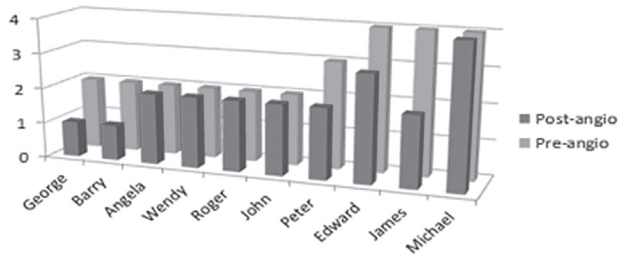

Figure 1: Severity of Health Problem Pre- and Post-Elective Ad-Hoc PCI
Disease Severity Rating
1=None 2=Mild 3=Moderate 4=Severe

participants reflects the distribution of cardiac disease in the population, particularly in individuals less than 65 years of age. Seven participants were employed, while three were retired. Three participants were university graduates, three graduated from college, and three were high school graduates. One participant completed only junior high school. Five participants resided in a rural area; however, they were within 60 km of Winnipeg.

Data Collection

A retrospective qualitative research approach was chosen to gain an appreciation of the salient features of the participants' elective ad-hoc PCI experiences. Demographic data were collected immediately prior to the interview. The PI conducted semi-structured interviews between December 2009 and May 2010. Interviews occurred an average 22 days (range of 11 to 35 days) post-elective ad-hoc PCI. The goal was to interview patients within 30 days of discharge to facilitate procedural recall and establish an understanding of their early post-discharge thoughts and experiences. Interviews lasted on average 67 minutes (range 29–101 minutes); all were audiotaped and transcribed verbatim. Participants were given pseudonyms to maintain their anonymity.

The semi-structure interview guide (see Appendix A for interview guide) was developed based on the HBM and relevant literature related to this patient population. A draft interview guide was pilot tested on an elective ad-hoc PCI patient and subsequently modified to improve clarity. The interview guide was adapted slightly during data collection to further explore meaning and emerging themes. The interview questions focused on the patients' perceptions of CAD susceptibility and severity, modifying factors that influenced their perceptions and behaviours, and the likelihood that they would adopt life style changes post-PCI.

Analysis

Transcribed interview files were managed using NVivo software. Thorne's (2008) interpretive description methodology was used to analyze the interview data. Reflective thoughts, questions, and perceptions were tracked through memos, while ongoing comparisons between participant transcripts drew out similarities and differences in perspectives. Dialogue between the co-authors resulted in an inductively generated initial list of codes, followed by the refinement of codes, where some codes were collapsed and new ones considered. The end result was the generation of a profile of patients newly diagnosed with CAD and treated by elective ad-hoc PCI.

Results

Three key themes emerged from analysis: *what a relief I'm better, uncertain health,* and *barriers to getting healthy*.

What a Relief, I'm Better

"What a relief, I'm better" was a common sentiment among participants, which was reflected in an overall decrease in the participants' perceived disease severity scores between pre- and post-PCI ratings (see Figure 1, for pre and post-elective ad-hoc PCI health severity ratings). While symptom relief was a component to this belief, several participants had never experienced anginal symptoms and reported alternative reasons for this perception.

Of particular concern was the finding that several participants appeared to misinterpret their physicians' evaluation of treatment success as an indication they were "fixed". In fact, two participants believed their physicians had told them they were cured:

> *"I'm thinking it's cured, it's good, it's just like it is brand new again... so it's just based on the two most important people involved, the doctor who did the procedure and my cardiologist." – Barry*

> *"He [the doctor] said you know except for that blockage, that I fixed up, your heart is very healthy… so I think I've got a zero problem really." – George*

Another participant was reluctant to evaluate his health until he had a chance to speak with his cardiologist, thus reinforcing the influence cardiologists appear to have on how the participants interpreted the seriousness of their heart problem.

> *"I think I have a minor heart problem right now, but I'll probably say something else after Friday. I have a follow-up with my cardiologist on Friday, so." – Roger*

Additionally, all participants' conveyed high expectations of treatment outcomes regardless of their pre-PCI symptoms. Four participants reported no symptom relief, but still perceived their health had improved post elective ad-hoc PCI.

> *"I don't feel any different but, of course, it has, it's unblocked clogged arteries." – Angela*

> *"I believe that it [the PCI] should make the heart work much more efficiently, so I'm not going to be so tired and I'll have more energy so I can get more things done… that hasn't happened yet, but I think it will." – John*

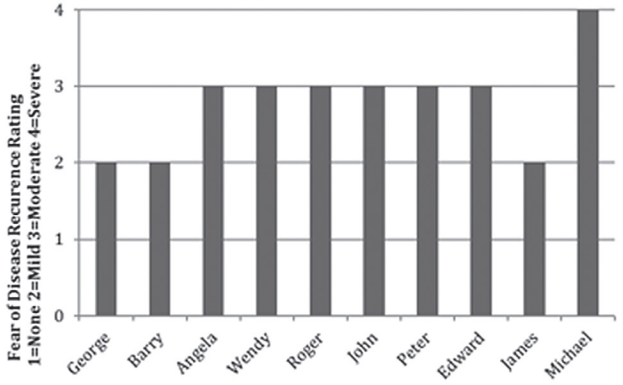

Figure 2: Fear of Future Heart Problems

Interestingly, the expedited PCI treatment afforded by an ad-hoc procedure also appeared to down grade the severity of their CAD:

"if they're already in there and they figure a stent will do it, they'll do it right then… if they did send you back and you had to come back for a second time, that would probably indicate there is something more serious going on there" – John

"it's nice to know that something that easy and that simple can be done to fix… which is really something that's life threatening. There's really nothing to it you know it was a piece of cake" - James

The participants' perceptions and belief that they were better, even cured, appeared to be the result of misunderstanding of the physician's procedural evaluation and benefits of the treatment, the expedited procedure, and gaps in their understanding of their risk factors.

Uncertain Health

Feelings of uncertainty dominated the participants' post-PCI experiences. In particular, the recovery phase was described as a time of great uncertainty, reflected in the participants' fairly high ratings of perceived vulnerability to cardiac disease (see Figure 2 for fear of future heart disease ratings).

Fear of disease reoccurrence was common among all participants. They openly shared their concerns about developing coronary artery blockages again and the uncertainty that posed to their future health.

"My biggest worry is that other ones might get clogged." – Angela

"I expect at some point I'm going to have some kind of problem somewhere … I don't dwell on it all the time, it's just I think it's a possibility." – John

Even the two participants who thought they were cured expressed feelings of susceptibility towards future CAD.

"It has to be some concern, because there has been a recognized problem." – Barry

"I guess what I really believe is in time it [blockage] will build up." – George

Additionally, almost half of the participants were challenged by an inability to evaluate treatment success, as they had minimal symptoms pre-PCI to guide comparisons post-PCI.

"I bust my shoulder years ago and it was good to know that after a while I could throw the ball again ... so, you could kind of judge that much better than something like this where you don't know what's going on inside here (points to his chest). You have no idea." – Peter

"Like my little sign was hardly nothing, I just thought well, OK, I'm getting older ... And how do you know that it's [blockage] gone?"– Angela

Finally, many of participants expressed uncertainty about a normal recovery after PCI. Peter best exemplified this uncertainty when he stated:

*"What is **normal** after ... not knowing OK will I be able to do that again … will I be able to, you know, run with my grandkids, will I be able to do those kinds of things. So, for me, that's more important than pain, I can work through pain."*

The participants' perceptions regarding their susceptibility to CAD appeared to be reflected in their uncertainty regarding their recovery and the future probability of developing new blockages. It is noteworthy that none of the participants appeared to perceive themselves to be immune to future problems with CAD. In fact, many believed they were highly susceptible to disease recurrence.

Interestingly, this uncertainty and fear of disease recurrence appeared to provide motivation to adopt healthier lifestyles.

"It's kind of scary, but I guess one needs to have something to scare them to, to live better, to live healthier."– Angela

"Well, I don't want to see my kids go without a dad right, so I think that, that sort of maybe changed my eating habits quite a bit." – Edward

Unfortunately participants encountered many barriers to achieving better health.

Barriers to Getting Healthy

Participants demonstrated a lack of awareness of their individual risk factors, which impeded their ability to make the necessary lifestyle changes.

"So, we don't know what the actual cause is, so we're guessing at the fix." – Barry

Others appeared confused by how the past lifestyle contributed to their current health status. One participant stated that she needed to alter her diet and increase her exercise in order to get on the 'right track,' but when asked if these factors contributed to her heart problem she stated:

"I don't think so, I don't know, but I don't think so. Like I don't know what I could have done to avoid it. I really don't." – Wendy

Overall, the participants appeared to lack understanding of cardiac risk factors.

"You have high blood pressure (Barry's wife). Nobody said it was a risk factor, so..."– Barry

"My cholesterol was 250, which I didn't, I don't understand what that really means." – Edward

"There's nothing in your genetics that would make your arteries clog other than your lifestyle is there? – Angela

A relationship appears to exist between the lack of understanding regarding risk factors for CAD and the incentive to make lifestyle changes.

"I think you make a lot of assumptions that you think people know or understand when they don't, you know, and especially a first-time patient. Now I think, too, if I wasn't the walking wounded, if I'd have had a heart attack I'd have got a lot more information." – George

Despite a lack or risk factor awareness, all participants indicated they were trying to implement health dietary changes. Conversely, the adoption of an exercise regimen was met with several challenges.

"Getting over my fear… that I am going to push it too hard at the gym and something is going to happen." – Michael

"We did buy a treadmill a number of years ago and I have used it occasionally, but when I'm working, I come home and I am exhausted." – Peter

"Just sitting and not knowing what you can or can't, can you go for a walk?" – Wendy

"What I'm lacking right now is exercise… Between work and the kids it's like I have no available time for myself." – Edward

While CRPs provide a supervised exercise environment, only two participants had received information regarding CRPs from a health care provider.

"Nobody's talked about it [Cardiac Rehabilitation Program], mentioned it, didn't come in any brochures, didn't even see it in any of the pamphlets, so." – Barry

The participants who planned to attend a CRP were discouraged by long wait times for enrolment.

"I'd be more motivated if I could get in [CRP] right way or something, I'd be like, let's go, gung ho, let's do it. But when you got to wait, you kind of, uh, maybe it's not really that important. They don't seem to think so." – John

"It's this waiting in-between, like why I couldn't have gone the next day somewhere and had somebody do a baseline with me and this waiting, it could be another two weeks before I get into the Wellness Centre." – Michael

Lack of information about "safe" exercise parameters and access to CRP created an activity conundrum that resulted in many participants erring on the side of caution (e.g., not exercising).

Participants expressed a desire for increased direction and support for making lifestyle changes.

"And I'm not saying anybody did anything wrong, I just don't know that the system is set up to help people through something unknown." – Michael

"I think guys like me actually need a support group. I really think it's like somebody who wants to quit drinking or smoking or whatever, if you don't have that lifestyle for me to change that, that's not going to happen on my own." – Peter

Poor understanding of their cardiac risk factors, limited direction for exercise, and long wait times for CRPs appeared to be significant barriers to making lifestyle changes for many participants.

Participants also described the lack of support as an additional barrier to lifestyle change.

Discussion

A key finding of this study was that the participants perceived a decrease in CAD disease severity post-PCI. However, this belief did not appear to translate into apathy about their health. All participants expressed a desire and interest in perusing healthier lifestyles. Similarly, Radcliffe and associates (2009) reported that although primary PCI patients (N=15) believed they were "fixed", this belief did not appear to interfere or hinder their plans to engage in lifestyle changes in the early post-PCI phase. Although previous research studies have speculated that a lack of engagement in risk reduction behaviours post PCI may be due to the belief that they are cured (Astin & Jones, 2006; Astin et al., 2009; Campbell & Torrance, 2005; Cronin et al., 2000; Eastwood, 2001; Lauck et al., 2009; Sampson, O'Cathain, & Goodacre, 2009), this conclusion was not supported by the current study. Our findings suggest that factors other than the belief of cure are at play with respect to the failure to adopt lifestyle changes in the first month following an elective ad-hoc PCI. Additionally, this study found that the belief of cure was largely the result of misinterpretation of physicians' treatment evaluations. Similarly, Goff and associates (2014) found evidence that cardiologists contribute to patients misconceptions of the benefits of PCI through the use of medical jargon, the overstatement of benefits, the understatement of risks, and communications styles that interfere with the patients understanding of the treatment.

All participants, even those who believed they were cured, articulated fear about disease reccurrence, which contributed to their perceived high degree of uncertainty about their future health. Previous research has also found that PCI patients expressed uncertainty associated with their heart health post PCI (Astin et al., 2009; Hasankhani, et al., 2014; Higgins, Dunn, & Theobald, 2000; Kimble, 1998; Lunden, Bengston, & Lundgren, 2006; Odell, Grip, & Hallberg, 2006; Ozkan et al., 2008). While participants in our study held the expectation that the elective ad-hoc PCI would immediately improve their health status, the need for treatment provided concrete evidence for the potential to develop further coronary artery blockages, which appeared to contribute to a sense of vulnerability to heart disease.

Hasankhani and associates (2014) found in a recent qualitative study of elective PCI patients (N=15) that angioplasty provided a second chance at life and was viewed as an opportunity to make different lifestyle choices. Although participants in this study described the PCI experience as motivation for lifestyle change, it was based on fear of disease. Similarly, Peterson and associates (2010) noted that the fear of recurrence was a strong motivating factor for the participants (N=61) in a CRP who successfully adopted a healthier lifestyle. However, Kimble (1998) found no significant relationship between fear of heart disease and participation in cardiac risk reduction behaviors in participants (N=58). The conflicting findings of Peterson and Kimble seem to suggest that fear of future cardiac events are not sufficient to change behaviour and that direction and support provided by structured prevention programs such as CRPs as in the Peterson study, are critical to success. The need for information and support to achieve success with lifestyle changes was confirmed by this study as the participants described a lack of information and support as barriers to lifestyle change.

A high sense of coherence has been found to positively influence healthy lifestyle behaviours in the cardiac population, and the most important component to a high sense of coherence is that patients receive sufficient information about their disease (Silarova et al., 2014). Unfortunately, all participants had significant gaps in their knowledge of personal risk factors and the role risk factors had in the development of their CAD. Previous researchers have also found that cardiac populations demonstrate a lack of risk factor awareness and have limited understanding of the disease process (Astin et al., 2009; Astin & Jones, 2006; Campbell & Torrance, 2005; Fernandez et al., 2006; Fernandez et al., 2008; Lauck et al., 2009; Kayaniyil et al., 2009; Tchicaya et al., 2012). As knowledge is generally viewed as a prerequisite for change, it is unlikely that individuals lacking knowledge about their cardiac risk factors will be able to make the necessary lifestyle changes.

Engaging in lifestyle change requires an awareness of how to manage individual risk factors. Consistent with previous research studies that found low exercise rates among the PCI population (Campbell & Torrance, 2005; Cronin et al., 2000; Fernandez et al., 2006; Higgins et al., 2000; Khattab et al., 2012; Lauck et al., 2009, Silarova et al., 2014), the authors found that exercise was very poorly integrated into the participants' post-PCI routine. Although participants recognized that exercise was critical to improving their health, they were uncertain about its safety and expressed fear of doing damage to the stent or their heart. Similarly, Hasankhani et al. (2014) also found their post coronary angioplasty patients had a fear of exercise best exemplified by this participant quote: "I am afraid of exercise that it might bring about an event (heart attack) … always concerned" (p. 147). Clearly, post-PCI patients require improved direction and support around exercise if they are to engage in active lifestyles.

Given that the motivation to change health behaviours exists, nurses have a central role to play in providing information to decrease uncertainty and fear related to physical activity post PCI. Educating patients on the benefits of CRPs for education, exercise and support, as well as tailoring post-PCI health information and programs to meet the individual's needs, fears and questions is a strategy that researchers have long advocated (Brieger & Redfern, 2013; Fernandez et al., 2008; Higgins et al., 2005; Kattainen, Merilainen, & Jokela, 2004; Ozkan et al., 2008; Paquet, Bolduc, Xhignesse, & Vanasse, 2005). Unfortunately, there is a serious gap between research results and changes in clinical practice, which continues to result in a dearth of prevention strategies for this patient population.

This study had several limitations. The retrospective approach may contribute to recall bias. However, interviewing participants within two to three weeks post PCI increased the credibility of these results, as participants were still able to recall the salient features of their elective ad-hoc PCI experience. In addition, the small sample size, as well as recruitment from only one site may limit transferability to other centres. Nevertheless, those centres that have similar practices with their elective ad-hoc PCI patient population may well recognize the gaps outlined in this study. While the aim was to recruit participants with a range of demographic characteristics, we were challenged to recruit individuals of lower socioeconomic status (SES). An explanation may be that individuals of lower SES encounter the health system at a different stage in the disease trajectory (e.g., urgent rather than elective PCI). The perceived lack of patients of lower SES undergoing elective PCI would be an interesting subject for further research. Finally, although discussions within the research team regarding the categories and themes increased the study's trustworthiness, no other form of triangulation was used to verify findings. The research findings were shared with the study participants after completion.

Implications for Practice

The health behaviour practices of patients after elective ad-hoc PCI are the consequence of a myriad of personal, environmental, and system factors. While some of these factors are outside the control of nursing responsibility, many are within our scope of practice. Patient needs are broad, encompassing assistance with understanding the PCI results, increased awareness of the implications of treatment and disease process, enhanced risk factor knowledge, and guidance concerning prevention strategies that can halt disease progression. A patient-centred model of care can help nurses tackle health system barriers that hinder lifestyle change through increased awareness of patient's knowledge, needs and resources. Nurses need to capitalize on the motivation to adopt a healthier lifestyle described in the early post-PCI phase by supporting patients through this transition. Improving the health outcomes of these patients will depend on our system innovations, commitment to implementing research results, and progress towards supporting their short- and long-term health information and prevention needs. ♥

About the Authors

Karen Throndson, RN, MN, Health Sciences Centre, Winnipeg, Manitoba

Jo-Ann V. Sawatzky, RN, PhD, Faculty of Nursing, University of Manitoba, Winnipeg, Manitoba

Annette Schultz, RN, PhD, Faculty of Nursing, University of Manitoba, Winnipeg, Manitoba

Corresponding Author: Karen Throndson, Health Sciences Centre, Winnipeg, Manitoba

Phone: 1 204 787-8827
Email: kthrondson@hsc.mb.ca

Acknowledgements

Financial support for this project included: a Student Scholarship from the Manitoba Health Research Council; an operating grant from the Health Sciences Centre Foundation—Dolly and Michael Gembey Nursing Research Award; and the Helen Glass Master of Nursing Award from the Canadian Nurses Foundation. This study could not have been completed without their generous support. These funding bodies had no input into the research or the content of this manuscript.

REFERENCES

Angus, J., Evans, S., Lapum, J., Rukholm, E., St. Onge, R., Nolan, R., & Michel, I.(2005). "Sneaky disease": The body and health knowledge for people at risk for coronary heart disease in Ontario, Canada. *Social Science & Medicine, 60,* 2117–2128. doi:10.1016/j.socscimed.2004.08.069

Aragam, K.G., Moscucci, M., Smith, Riba, A.L., Zainea, M., Chambers, J.L., … Gurm, H.S. (2011). Trends and disparities in referral to cardiac rehabilitation after percutaneous coronary intervention. *American Heart Journal, 161*(3), 544–551. doi:10.1016/j.ahj2010.11.016

Astin, F., Closs, S.J., McLenachan, J., Hunter, S., & Priestly, C. (2009). Primary angioplasty for heart attack: Mismatch between expectations and reality? *Journal of Advanced Nursing, 65*(1), 72–78. doi:10.1111/j.1365-2648.2008.04836.x

Astin, F., & Jones, K. (2006). Changes in patients' illness representations before and after elective percutaneous transluminal coronary angioplasty. *Heart & Lung, 35*, 293–300. doi:10.1016/j.hrtlng.2005.09.006

Astin, F., & Jones, K. (2004). Heart disease attributions of patients prior to elective percutaneous transluminal coronary angioplasty. *Journal of Cardiovascular Nursing, 19*(1), 41–47.

Becker, M.H. (1974). *The health belief model and personal health behavior.* New Jersey: Charles B. Slack, Inc.

Bethell, H.J.N., Evans, J.A., Turner, S.C., & Lewin, R.J.P. (2006). The rise and fall of cardiac rehabilitation in the United Kingdom since 1998. *Journal of Public Health, 29*(1), 57–61. doi:10.1093/pubmed/fdl091

Bethell, H., Lewin, R., Evans, J., Turner, S., Allender, S., Petersen, S. (2008). Outpatient cardiac rehabilitation attendance in England. *Journal of Cardiopulmonary Rehabilitation and Prevention, 28,* 286–391.

Brieger, D.B., & Redfern, J. (2013). Contemporary themes in acute coronary syndrome management: from acute illness to secondary prevention. *Medical Journal of Australia, 199*(3), 174–178. doi:10.5694/mja12.11224

Campbell, M., & Torrance, C. (2005). Coronary angioplasty: Impact on risk factors and patients' understanding of the severity of their condition. *Australian Journal of Advanced Nursing, 22*(4), 26–31.

Cronin, S.N., Freeman, L.H., Ryan, G., & Drake, D.M. (2000). Recovery after percutaneous transluminal coronary angioplasty: Assessment after discharge. *Critical Care Nurse, 20*(2), 70–76.

Dendale, P., Berger, J., Hansen, D., Vaes, J., Benit, E., & Weymans, M. (2005). Cardiac rehabilitation reduces the rate of major adverse cardiac events after percutaneous coronary intervention. *European Journal of Cardiovascular Nursing, 4,* 113–116. doi:10.1016/j.ejcnurse.2004.11.003

Eastwood, G.M. (2001). Lifestyle pattern change in males following percutaneous transluminal coronary angioplasty/intracoronary stenting. *International Journal of Nursing Practice, 7,* 131–137.

Fernandez, R.S., Griffiths, R., Juergens, C., Davidson, P., & Salamonson, Y. (2006). Persistence of coronary risk factor status in participants 12 to 18 months after percutaneous coronary intervention. *Journal of Cardiovascular Nursing, 21*(5), 379–387.

Fernandez, R.S., Salamonson, Y., Griffiths, R., Juergens, C., & Davidson, P. (2008). Awareness of risk factors for coronary heart disease following interventional cardiology procedures: A key concern or nursing practice. *Internation Journal of Nursing Practice,14,* 435–442. doi:10.1111/j.1440-172X.2008.00717.x

Gilchrist, I. (2014). Same day discharge after elective percutaneous coronary intervention. *Current Cardiology Report, 16,* 470. doi:10.1007/s11886-014-0470-y

Goel, K., Lennon, R.J., Tilbury, T., Squires, R.W., & Thomas, R.J. (2011). Impact of cardiac rehabilitation on mortality and cardiovascular events after percutaneous coronary intervention in the community. *Circulation, 123,* 2344–2352. doi:10.1161/CIRCULATIONAHA.110.983536

Goff, S.L., Mazor, K.M., Ting, H.H., Kleppel, R., & Rothberg, M.B. (2014). How cardiologists present the benefits of percutaneous coronary intervention to patients with stable angina: A qualitative analysis. *Journal of the American Medical Association Internal Medicine, 174,* 1614–1621. doi:10.1001/jamainternmed.2014.3328

Hasankhani, H., Gholizadeh, L., Mohammadi, E., Zamanzadeh, V., Allahbakhshian, A., Ghaffari, S., & Allahbakhshian, M. (2014). The lived experience of patients post coronary angioplasty: A qualitative study. *Journal of Vascular Nursing, 32,* 144–150. doi:org/10.1016/j.jvn.2014.04.001

Hassan, A., Newman, A., Ko, D.T., Rinfret, S., Hirsch, G., Ghali, W.A., & Tu, J.V. (2010). Increasing rates of angioplasty versus bypass surgery in Canada, 1994-2005. *American Heart Journal, 160,* 958–965.

Higgins, H.C., Hayes, R.L., & McKenna, K.T. (2001). Rehabilitation outcomes following percutaneous coronary interventions (PCI). *Patient Education and Counseling, 43,* 219–230.

Higgins, M., Dunn, S., & Theobald, K. (2000). The patients' perception of recovery after coronary angioplasty. *Australian Critical Care, 13*(3), 83–88.

Higgins, R.O., Murphy, B.M., Le Grande, M.R., Parkinson, A., Worcester, M.U.C., & Goble, A.J. (2005). Expressed preferences for health education of patients after percutaneous coronary intervention. *European Journal of Cardiovascular Prevention and Rehabilitation, 12,* 572–579.

Kattainen, E., Merilainen, P., & Jokela, V. (2004). CABG and PTCA patients' expectations of informational support in health related quality of life themes and adequacy of information in 1-year follow-up. *European Journal of Cardiovascular Nursing, 3,* 149–163.

Kayaniyil, S., Arden, C.I., Winstanley, J., Parsons, C., Brister, S., Oh, P., … Grace, S.L. (2009). Degree and correlates of cardiac knowledge and awareness among cardiac in-patients. *Patient Education and Counselling, 75,* 99–107. doi:10.1016/j.pec.2008.09.005

Khattab, A.A., Knecht, M., Meier, B., Windecker, S., Schmid, J-P., Wilhelm, M., & Saner, H. (2012). Persistence of uncontrolled cardiovascular risk factors in patients treated with percutaneous interventions for stable coronary disease not receiving cardiac rehabilitation. *European Journal of Preventive Cardiology, 20*(5), 743–749. doi:10.1177/2047487312447751

Kimble, L.P. (1998). Cognitive appraisal and cardiac risk reduction behavior following coronary angioplasty. *Western Journal of Nursing Research, 20*(6), 733–744. doi:10.1177/019394599802000605

Lauck, S., Johnson, J.L., & Ratner, P.A. (2009). Self-care behaviour and factors associated with patient outcomes following same-day discharge percutaneous coronary intervention. *European Journal of Cardiovascular Nursing, 8,* 190–199. doi:10.1016/j.ejcnurse.2008.12.002

Lisspers, J., Sundin, O., Ohman, A., Hofman-Bang, C., Ryden, L., & Nygren, A. (2005). Long- term effects of behaviour change in coronary artery disease: effects on recurrent coronary events after percutaneous coronary intervention. *Health Psychology, 24*(1), 41–48. doi:10.1037/0278-6133.24.1.41

Lisspers, J., Sundin, O., Hofman-Bang, C., Nordlander, R., Nygren, A., Ryden, L., & Ohman, A. (1999). Behavioral effects of a comprehensive multifactoral program for lifestyle change after percutaneous transluminal coronary angioplasty: A prospective randomized, controlled study. *Journal of Psychosomatic Research, 46*(2), 143–154.

Lunden, M.H., Bengtson, A., & Lundgren, S.M. (2006). Hours during and after coronary intervention and angiography. *Clinical Nursing Research, 15,* 274–289. doi:10.1177/1054773806291855

Mack, M.J., Prince, S.L., Herbert, M., Brown, P.P., Katz, M., Palmer, G., … Dewey, T.M. (2008). Current outcomes of percutaneous coronary intervention and coronary artery bypass grafting. *Annuals of Thoracic Surgery, 86*, 496–503.

Odell, A., Grip, L., & Hallberg, L.R.M. (2006). Restenosis after percutaneous coronary intervention (PCI): Experiences from the patients' perspective. *European Journal of Cardiovascular Nursing, 5,* 150–157. doi:10.1016/j.ejcnurse.2005.10.004

Ozkan, O., Odabasi, J., & Ozcan, U. (2008). Expected treatment benefits of percutaneous transluminal coronary angioplasty: The patient's perspective. *International Journal of Cardiovascular Imaging, 24,* 567–575. doi:10.1007/s10554-008-9297-1

Paquet, M., Bolduc, N., Xhignesse, M., & Vanasse, A. (2005). Re-engineering cardiac rehabilitation programmes: Considering the patients' point of view. *Journal of Advanced Nursing, 51*(6), 567–576.

Peterson, J.C., Allegrante, J.P., Pirraglia, P.A., Robbins, L., Lane, K.P., Boschert, K.A., & Charlson, M.E. (2010). Living with heart disease after angioplasty: A qualitative study of patients who have been successful or unsuccessful in multiple behavior change. *Heart &Lung, 39,* 105–115. doi:10.1016/j.hrtlng.2009.06.017

Radcliffe, E.L., Harding, G., Rothman, M.T., & Feder, G.S. (2009). 'It got right to the spot' the patient experience of primary angioplasty: A qualitative study. *European Journal of Cardiovascular Nursing, 8,* 216–222. doi:10.1016/j.ejcnurse.2009.02.001

Reid, R.D., Morrin, L.I., Pipe, A.L., Dafoe, W.A., Higginson, L.A.J., Wielgosz, A.T., et al. (2006). Determinants of physical activity after hospitalization for coronary artery disease: The tracking exercise after cardiac hospitalization (TEACH) study. *European Journal of Cardiovascular Prevention and Rehabilitation, 13,* 529–537.

Sampson, F., O'Cathain, A., & Goodacre, S. (2009). Feeling fixed and its contribution to patient satisfaction with primary angioplasty: A qualitative study. *European Journal of Cardiovascular Nursing, 8,* 85–90. doi:10.1016/j.ejcnurse.2008.07.003

Schwaab, B., Waldmann, A., Katalinic, A., Sheikhzadeh, A., & Raspe, H. (2011). In-patient cardiac rehabilitation versus medical care—A prospective multicenter controlled 12-month follow-up in patients with coronary heart disease. *European Journal of Cardiovascular Prevention & Rehabilitation, 18*(4), 581–586. doi:10.1177/1741826710389392.

Silarova, B., Nagyova, I., Rosenberger, J., Studencan, M., Ondusova, D., Reijneveld, S.A., & P van Dijk, J. (2014). Sense of coherence as a predictor of health related behaviours among patients with coronary artery disease. *European Journal of Cardiovascular Nursing, 13,* 345–356. doi.10.1177/1474515113497136

Tchicaya, A., Braun, M., Lorentz, N., Delagardelle, C., Beissel, J., & Wagner, D. R. (2012). Social inequality in awareness of cardiovascular risk factors in patients undergoing coronary angiography. *European Journal of Preventive Cardiology, 20*(5), 872–879. doi:10.1177/2047487312446123

Thorne, S. (2008). *Interpretive description.* Walnut Creek, CA: Left Coast Press, Inc.

Williams, M.A., Ades, P.A., Hamm, L.F., Keteyian, S.J., LaFontaine, T.P., Roitman, J.L., & Squires, R.W. (2006). Clinical evidence for a health benefit from cardiac rehabilitation: An update. *American Heart Journal, 152,* 835–841. doi:10.1016/j.ahj.2006.05.015

Worcester, M.U.C., Murphy, B.M., Mee, V.K., Roberts, S.B., & Goble, A.J. (2004). Cardiac rehabilitation programmes: Predictors of non-attendance and drop-out. *European Journal of Cardiovascular Prevention and Rehabilitation, 11*, 328–335. doi:10.1097/01.hjr.0000137083.20844

Appendix A: Interview Guide

1. Please tell me about your health prior to and leading up to your angioplasty procedure.

2. Please tell me why you think you developed blockages in your heart?

3. Please tell me about your angioplasty.
Angioplasty – Now I would like you to focus on your time in hospital. I am really interested in understanding what this experience was like for you.

4. What was your expectation of the angioplasty?

5. Please tell me about the health care providers involved in your care.

6. Please tell me about the discharge planning you received.

7. Please tell me about your recovery from the procedure.

8. In your perception how has the angioplasty affected your health? Tell me more about that… explain what you mean by that….
Post Angioplasty – I would now like you to reflect on your health since the angioplasty.

9. Have you seen your doctor since your procedure?

10. How worried are you about having a problem with your heart arteries again?

11. Can you tell me about your feelings around having to have an angioplasty.

12. Can we talk for a few minutes about your lifestyle?

Closing: 13. Can you think of anything else you would like to share with me about your experiences with angioplasty? The recovery? or trying to make lifestyle changes?

Le maintien de l'activité physique après avoir participé à un programme de réadaptation cardiaque

Raphaël Mignault-Laplante, Paul-Émile Bourque, Ph.D., L.Psych., et Sarah Pakzad, Ph.D., L.Psych.

Résumé

Dans le domaine de la réadaptation cardiaque, la phase III (phase de maintien) a reçu peu d'attention comparativement à la phase II (phase de réadaptation). Les études ayant porté sur la phase de maintien ont mis en évidence l'importance de maintenir les nouvelles habitudes de vie saines afin d'en conserver les bienfaits et de prévenir la récurrence de maladies cardiovasculaires ainsi que la mortalité. Toutefois, ces études ont révélé des taux d'abandon préoccupants, allant de 25 à 50 %. Les recherches portant sur les facteurs associés au maintien des nouvelles habitudes de vie saines après avoir complété la phase II d'un programme de réadaptation cardiaque sont peu nombreuses. La présente étude se distingue en utilisant des mesures des facteurs de risque et de la qualité de vie comme prédicteurs du maintien de l'activité physique. L'objectif de ce projet est de vérifier quelles sont les variables associées au maintien de l'activité physique durant la phase III. L'échantillon de cette étude est constitué de 529 patients ayant complété, entre 2005 et 2012, la phase II du programme de réadaptation cardiaque Cœur en santé à l'Université de Moncton. Les principaux résultats montrent que les patients susceptibles de ne pas maintenir l'activité physique sont ceux qui sont plus jeunes, qui sont des hommes, qui ne présentent que quelques facteurs de risque et qui ont obtenu un score peu élevé sur l'échelle sommaire de qualité de vie physique, particulièrement en ce qui concerne les composantes rôle physique et santé générale.

Abstract

In the area of cardiac rehabilitation, little attention has been given to phase III (maintenance phase), as compared to phase II (rehabilitation phase). Studies on the maintenance phase have highlighted the importance of maintaining the newly acquired healthy living habits in order to continue benefitting from them and prevent the recurrence of cardiovascular diseases and mortality. However, these studies have revealed disturbing dropout rates, from 25 to 50%. There is little research on the factors associated with the maintenance of the new healthy living habits after completing phase II of a cardiac rehabilitation program. This study innovates by measuring risk factors and quality of life, as predictors of exercise maintenance. The goal of this project is to verify which variables are linked to the maintenance of physical activity during phase III. The sample of the study is composed of 529 patients who completed, between 2005 and 2012, phase II of the cardiac rehabilitation program, called Coeur en santé, offered by the Université de Moncton. The main results show that patients at risk of not maintaining their physical activity are younger, male, with only a few risk factors and a lower score on the quality of physical life scale, particularly with respect to the physical role and general health components.

Keywords: cardiac-rehabilitation, maintenance, physical activity and risk factors

Mignault-Laplante, R., Bourque, P.É., & Pakzad, S. (2016). Le maintien de l'activité physique après avoir participé à un programme de réadaptation cardiaque. *Canadian Journal of Cardiovascular Nursing*, *26*(2), 33–40.

Article Highlights

- Young males are at an increased risk of not maintaining their physical activity
- Strategies should be designed with these individuals in mind to significantly reduce the risk of heart disease

Les programmes de réadaptation cardiaque visent le maintien du fonctionnement physique ainsi que la prévention d'éventuels évènements cardiaques, de futures réhospitalisations et de l'apparition d'autres maladies cardiaques chez les patients ayant déjà reçu un diagnostic de maladie cardiovasculaire (Association canadienne de prévention et de réadaptation cardiovasculaires, 2011; Balady et al., 2000; Pinto et al., 2011). Dans plusieurs études, on dit que le patient est en phase de maintien lorsqu'il continue d'exécuter régulièrement les comportements de santé qu'il a appris lors de la phase II sur une période d'au moins six mois (Bock et al., 1997; Hughes et Mutrie, 2006). Vandal et al. (1999) mentionnent la distinction importante entre l'adoption d'un comportement qui constitue une modification à court terme du comportement et le maintien qui constitue une modification à long terme. Cependant, Bock et al. (1997) indiquent que le maintien des comportements d'exercice nouvellement acquis après la réadaptation demeure un problème. Ils rapportent des taux d'abandon allant de 25 % dans les trois premiers mois à 50 % dans les six premiers mois après avoir complété la phase II d'un programme de réadaptation cardiaque (Carmody, Senner, Manilow et Matarazzo, 1980; Olridge, 1991). La présente étude vise l'identification de variables associées

au maintien de l'activité physique en phase III afin de mieux comprendre les taux d'abandon durant cette étape (25 à 50%) et de cibler des interventions personnalisées pour les patients présentants le risque de ne pas maintenir d'activité physique après la phase II.

On retrouve des variations dans la littérature au niveau de la définition des phases. Plusieurs programmes définissent la phase II comme étant la phase de réadaptation cardiaque, tandis que dans d'autres programmes, cette dernière est la III (Hevey, McGee, & Horgan, 2007; Kerins, McKee, & Bennett, 2011; Seki et al., 2003). Ceux-là incluent une phase supplémentaire qui fait le pont entre la phase I (la phase aiguë où le patient est hospitalisé) et la phase III (réadaptation cardiaque). Lors de cette phase II, le personnel médical fournit des informations sur la santé, en contactant les patients par téléphone, en effectuant des visites à domicile ou en offrant des séances d'éducation en groupes.

La littérature portant sur la phase de maintien est moins répandue que celle traitant d'intervention et des programmes de réadaptation (Boesch, Myers, Habersaat, Kottman et Dubach, 2005; Gupta, Sanderson, Bittner et Vera, 2007). Yohannes, Doherty, Bundy et Yalfani (2010) ont évalué les bénéfices à long terme de la réadaptation cardiaque (phase II) sur la dépression, l'anxiété, l'activité physique et la qualité de vie. Leurs résultats indiquent que les bénéfices obtenus ont été maintenus un an après la complétion de la phase II. Contrairement aux résultats de Gupta et al. (2007), ceux de Yohannes et al. (2010) ont révélé que les femmes obtiennent les mêmes bénéfices que les hommes. Toutefois, les chercheurs n'ont pas considéré si les patients ont suivi un programme de maintien ou bénéficié d'un soutien quelconque pour le maintien (Vandal, Bradet, Viens et Robichaud-Ekstrand, 1999). L'un des principaux objectifs de la réadaptation cardiaque est de faire en sorte que les patients conservent les bienfaits acquis pour améliorer leur qualité de vie et pour prévenir la survenue d'autres évènements cardiaques, la comorbidité et la mortalité. Bock, Carmona-Barros, Esler et Tilkemeier (2003) ont trouvé que, parmi les patients ayant complété la phase d'intervention d'un programme de réadaptation cardiaque, ceux qui ont participé à la phase de maintien ont obtenu de meilleurs taux de maintien de l'activité physique sur une période de douze mois comparativement aux patients n'ayant pas participé à la phase de maintien.

Boulay et Prud'homme (2004) ont comparé une phase d'intervention et de réadaptation de courte durée (trois mois) à une phase de réadaptation de longue durée (douze mois). Les chercheurs ont observé qu'après un an, il y avait une diminution significative du nombre total de réadmissions à l'hôpital pour le groupe ayant participé à la phase III ainsi qu'une diminution du recours à des soins de santé, ce qui ne s'est pas avéré être le cas pour le groupe n'ayant participé qu'à la phase d'intervention. Ceci rejoint les études qui avancent qu'une phase de maintien après la phase d'intervention peut contribuer à maintenir les bienfaits acquis (Brubacker et al., 1996; Olridge, 1991). Pourtant, malgré ces bienfaits, près de 50 % des patients inscrits en phase de maintien vont abandonner au cours des six premiers mois (Olridge et Striner, 1990). Étant donné le faible nombre d'études qui prennent en considération le taux de maintien après la phase II, il serait important que celui-ci fasse l'objet de nouvelles recherches afin d'obtenir des résultats plus récents et d'y apporter un nouvel éclairage. Dolansky et ses collègues (2010) ont établi que les hommes âgés (70 ans et plus) ont davantage de difficultés à maintenir les comportements d'exercice après un programme de réadaptation comparativement aux hommes plus jeunes (60 ans et moins). Dans l'étude de Pinto et al. (2011), les femmes ont obtenu un taux d'abandon atteignant près du double de celui des hommes durant la phase de maintien (phase III) de six mois, bien que ce résultat ne soit pas tout à fait significatif (p = 0,06). Taylor et al. (2011) ont conduit une revue systématique des facteurs associés à l'adhérence à la phase II. Ils ont constaté des résultats différents d'une analyse à l'autre concernant les taux de participation aux programmes de réadaptation cardiaque. Il serait intéressant de comparer le taux de participation des femmes et des hommes à la phase de maintien.

Même si des études ont prouvé que plusieurs bénéfices obtenus en réadaptation cardiaque (phase II) se maintiennent à long terme, il faut rester prudent quant à l'interprétation de leurs résultats, certaines ne prenant pas en compte si les patients ont suivi ou non un programme de maintient pendant la période entre la complétion de la phase II et le suivi, généralement douze mois plus tard. La variabilité d'un programme à un autre et les différences méthodologiques de recherche pourraient être les raisons pour lesquelles on retrouve, à l'heure actuelle, une inconsistance à travers les études quant aux effets à long terme de la réadaptation cardiaque. Ainsi, il demeure important de continuer à étudier ces effets.

À notre connaissance, peu de chercheurs ont entrepris d'identifier les variables sociodémographiques, physiologiques et psychosociales des patients avant que ces derniers entament un programme de réadaptation cardiaque dans le but de voir si certaines de ces variables pourraient prédire ou du moins être associées à la participation à la phase de maintien. La présente étude se distingue en utilisant des mesures des facteurs de risque et de la qualité de vie comme prédicteurs du maintien de l'activité physique.

L'objectif de ce projet est de vérifier quelles sont les variables associées au maintien de l'activité physique suite à la participation à un programme de réadaptation cardiaque. Selon l'hypothèse, les variables sociodémographiques (âge, sexe) et celles liées à la santé (nombre total de facteurs de risque, symptômes dépressifs et qualité de vie physique et mentale) au temps 1 prédiront l'appartenance au groupe de

patients participant à la phase de maintien (phase III) ou à celui de patients ayant complété la phase II mais ne participant pas à la phase III. Pouvoir identifier ces variables avant même d'avoir commencé la phase II permettrait au professionnel de la santé de mettre en place des interventions personnalisées pour les patients susceptibles de ne pas maintenir leurs comportements sains une fois la phase II terminée.

Méthode

Participants

L'échantillon de cette étude est constitué de patients ayant complété, entre 2005 et 2012, la phase d'intervention de 12 semaines du programme de réadaptation cardiaque *Cœur en santé* au CEPS Louis-J.-Robichaud de l'Université de Moncton, sur la recommandation de leur médecin après un évènement cardiaque. Seuls les patients ayant participé à 75 % des séances, soit 18 séances sur 24, sont considérés comme ayant complété la phase II. Les participants qui continuent de venir au programme *Cœur en santé* après avoir complété la phase II sont considérés comme étant en phase de maintien (phase III). Le nombre total de participants est de 529. Cet échantillon affiche une moyenne d'âge de 68,3 ans (É.T. = 8,6) et comprend 322 hommes et 207 femmes. La majorité des patients inclus dans cet échantillon sont en couple (77,3 %), 5,7 % sont célibataires, 6,6 % sont veufs et 6,8 % sont divorcés/séparés.

Mesures

Variables sociodémographiques. Lors de l'inscription au programme, quelques variables sociodémographiques sont répertoriées par le personnel. On y retrouve l'âge, le sexe, la profession, s'ils sont à la retraite ou non, l'état civil ainsi que la langue. Aux fins de la présente étude, seules les variables âge (variable continue) et sexe sont retenues.

Variables physiologiques. Une multitude de variables physiologiques ont été mesurées avant que les patients n'entament le programme, puis trois mois après le commencement. D'abord, il y a la tension artérielle systolique et la tension artérielle diastolique, puis le poids (kg), l'indice de masse corporelle (kg/m^2) et la circonférence de la taille (cm). Les données issues d'une épreuve d'effort (MET) y sont également documentées, de même que le cholestérol total, le cholestérol LDL et HDL, le taux de triglycérides, la glycémie et la consommation de tabac.

Les diagnostics de maladies cardiovasculaires et les opérations cardiaques (angioplastie, pontage, etc.) sont répertoriés, de même que les autres conditions médicales actuelles et antérieures des patients (cancer, ostéoporose, hyperthyroïdie, etc.). Les patients doivent également répondre à un questionnaire portant spécifiquement sur la présence de facteurs de risque lors de leur inscription au programme. Ces facteurs sont l'hypertension, la dyslipidémie, les antécédents familiaux, le diabète, l'obésité, le niveau de stress, l'état psychologique (présence de détresse), la sédentarité, l'alcoolisme et le tabagisme. Pour la présente étude, la variable physiologique retenue est le nombre total de facteurs de risque physiologiques.

Variables psychosociales. Bien que le questionnaire contienne diverses mesures psychosociales, seules les variables de dépression et de qualité de vie ont été retenues. L'évaluation de la présence de symptômes dépressifs chez les patients a été effectuée à l'aide du Beck Depression Inventory (BDI) (Beck et Steer, 1978) pour les anglophones et de sa version française, soit le Questionnaire de dépression de Beck (QDB) (Bourque et Beaudette, 1982) pour les francophones. Ce questionnaire est constitué de 21 items qui sont associés à des symptômes de dépression. Le sujet doit répondre à chaque item selon une échelle de type Likert allant de 0 à 3 d'après la manière dont il s'est senti durant les sept derniers jours. Les résultats, variant de 0 à 63, sont répartis selon quatre catégories : de 0 à 9 = absence de dépression; de 10 à 16 = dépression légère; de 17 à 29 = dépression modérée; 30 et plus = dépression grave.

Quant aux qualités psychométriques, le BDI démontre une bonne stabilité temporelle avec des coefficients alpha de Cronbach variant de 0,60 à 0,90 et une bonne cohérence interne avec des coefficients alpha variant de 0,86 chez une population psychiatrique à 0,81 chez une population non psychiatrique (Beck, Steer et Carbin, 1988). La validité est similaire aux autres mesures de dépression. La version française (QDB) démontre des propriétés psychométriques semblables à celles du BDI (Bourque et al., 1982). Pour l'analyse principale, la variable dépression est continue.

Le SF-36 (*MOS 36-item short-form health survey*) est un instrument destiné à recueillir la perception qu'ont les patients de leur état de santé. L'état de santé est considéré comme un facteur qui contribue de façon importante à la qualité de vie d'un individu (Ware et Kosinski, 2001; Ware et Sherbourne, 1992). Dempster et Donnelly (2000) ont évalué plusieurs questionnaires de la qualité de vie liée à l'état de santé chez une population cardiaque et ont trouvé que le SF-36 figure parmi les deux instruments qui conviennent le mieux à l'heure actuelle pour l'évaluation de cette mesure. La version française de Leplège, Écosse, Verdier et Perneger (1998) a été utilisée auprès des patients francophones.

Ce questionnaire multidimensionnel est composé de 36 items répartis en huit sous-échelles et deux grandes échelles sommaires. Quatre sous-échelles sont liées à la composante physique de la santé et quatre autres, à l'aspect mental de la santé. Dans la composante physique, on retrouve les sous-échelles suivantes : le fonctionnement physique, les limitations dans les rôles dues à des problèmes de santé physique, la douleur corporelle et la santé générale. La composante mentale comprend les sous-échelles suivantes : la vitalité, le fonctionnement social, les limitations dans les rôles dues à des problèmes émotionnels et la santé mentale.

Les choix de réponses sont principalement répartis sur

Tableau 1 : Répartition en pourcentages et en moyennes des variables sociodémographiques, physiologiques et psychosociales à l'étude (N = 529)

Variables	N	%	M	É.T.
Facteurs de risque non modifiables				
Âge			68,30	8,60
50 à 59 ans	83	15		
60 à 69 ans	207	39		
70 ans et plus	239	45		
Sexe				
Hommes	322	61		
Femmes	207	39		
Facteurs de risque modifiables			3,29	1,46
Hypertension	333	70		
Dyslipidémie	396	75		
Antécédents familiaux	304	58		
Diabète	132	25		
Obésité (IMC >25)	223	42		
Stress	99	19		
Sédentarité	150	28		
Tabagisme	63	12		
BDI	523		7,67	7,30
PCS	528		39,20	14,90
MCS	528		50,00	11,30

Note. IMC = Indice de masse corporelle; BDI = Beck Depression Inventory; PCS = Physical Component Summary; MSC = Mental component summary.

une échelle de type Likert variant de 1 à 3, de 1 à 5 et de 1 à 6. La signification des chiffres varie d'une question à l'autre. Par exemple, à la première question « Dans l'ensemble, pensez-vous que votre état de santé est », 1 correspond à « Excellente » et 5, à « Mauvaise » tandis qu'à la deuxième question « Par rapport à l'année dernière à la même époque, comment trouvez-vous votre état de santé en ce moment? », 1 correspond à « Bien meilleur que l'an dernier » et 5, à « Beaucoup moins bon ». Quelques items offrent deux choix de réponses. Le score de chaque sous-échelle varie de 0 à 100 et un score élevé signifie que l'individu se perçoit en meilleure santé.

Bien que les normes du SF-36 soient originellement américaines, Hopman et ses collègues (2000) ont réalisé une étude qui a permis d'établir des normes canadiennes. Pour ce qui est de la fidélité de l'échelle physique, les alphas de Cronbach de la cohérence interne et de la fidélité test-retest varient entre 0,89 et 0,94. En ce qui a trait à la fidélité de l'échelle mentale, les alphas de Cronbach varient entre 0,74 et 0,91. Les échelles physiques et mentales ainsi que leurs sous-échelles démontrent une bonne validité discriminante. Le SF-36 peut donc être considéré comme une mesure appropriée.

Procédure

Le présent projet de recherche a reçu l'approbation du Comité d'éthique de la recherche du Centre hospitalier universitaire régional Dr-Georges-L.-Dumont, de la Régie régionale de santé A. Le projet a également été soumis au Comité d'éthique de la Faculté des études supérieures et de la recherche de l'Université de Moncton, lequel a indiqué qu'un projet de recherche n'utilisant que des données secondaires n'a pas besoin de recevoir son approbation pour poursuivre la recherche.

Ce projet de recherche consiste en une analyse de données secondaires dont la source est la banque de données du programme *Cœur en santé* à l'Université de Moncton.

Résultats

Le tableau 1 présente les données en moyennes et en pourcentages de l'échantillon global de l'étude (N = 529), en fonction des caractéristiques sociodémographiques et des variables liées à la santé. La moyenne d'âge de l'échantillon est de 68,3 ans (É.T. = 8,6). L'échantillon est composé de 60,9 % d'hommes et de 39,1 % de femmes. Les patients de cet échantillon ont en moyenne 3,59 facteurs de risque. Les facteurs de risque les plus fréquents sont la dyslipidémie (74,9 %), l'hypertension (70,3 %), les antécédents familiaux (57,5 %) et l'obésité (42,2 %). Ensuite, on retrouve la sédentarité (28,4 %), le diabète (25 %), le stress (18,7 %) et le tabagisme (11,9 %). Quant aux variables psychosociales, le score moyen obtenu sur le BDI est de 7,67, ce qui indique un faible niveau de dépression. Seulement 13 % des patients de l'échantillon ont eu un score supérieur à 16 sur le BDI, alors que 87 % d'entre eux ont dit avoir très peu ou pas du tout de symptômes dépressifs. En moyenne, les patients ont obtenu un score sommaire physique (PCS) de 39,2 et un score sommaire mental (MCS) de 50. De façon exploratoire et pour une compréhension plus approfondie, une analyse de test-t des quatre composantes du score sommaire physique a été réalisée. Les résultats indiquent qu'il y a une différence entre les groupes en ce qui a trait aux composants rôles physiques et *santé générale*. Le *rôle physique* fait référence à la capacité de la personne à effectuer ses activités quotidiennes. Les patients appartenant au groupe de maintien ont obtenu un score plus élevé sur cette composante que ceux du groupe de non-maintien.

Les postulats de base ont fait l'objet de vérifications pour la régression logistique et les résultats se sont avérés appropriés. Le modèle d'analyse de régression logistique binaire (âge, sexe, nombre total de facteurs de risque, score sur le

Tableau 2 : Coefficients de la régression logistique du maintien de l'activité physique au sein du programme Cœur en Santé (N = 529)

Prédicteurs	β	Erreur standard	Rapports de cote	Intervalle de confiance à 95 % pour les rapports de chance	
				Borne inférieure	Borne supérieure
Sexe (hommes)	-0,47*	0,20	0,63	.421	0,93
Âge	0,03**	0,01	1,03	1,01	1,05
#FDR	0,14*	0,07	1,15	1,00	1,32
BDI	0,02	0,02	1,02	0,98	1,05
PCS	0,03**	0,01	1,03	1,01	1,05
MCS	-0,01	0,01	0,99	0,97	1,02

*Note. * p < 0.05; ** p < 0.01; #FDR = Nombre de facteurs de risque; BDI = Beck Depression Inventory; PCS = Physical Component Summary; MCS = Mental component summary.*

BDI, score sommaire physique et score sommaire mental) est présenté au tableau 2. Le modèle complet contenant tous les prédicteurs est significatif, χ^2 (6, N = 529) = 23,52, p = 0,001, ce qui indique que le modèle est en mesure de distinguer les participants qui ont poursuivi l'activité physique en phase de maintien de ceux qui ne l'ont pas poursuivie. Le modèle entier explique entre 4,4 % (R^2 de Cox et Snell) et 6,1 % (R^2 de Nagelkerke) de la variance au niveau de la poursuite de l'activité physique en phase de maintien, et a correctement classifié 66,2 % des cas.

Le meilleur prédicteur quant à la poursuite de l'activité physique en phase de maintien est le score sommaire physique, dont le rapport de cote est de 1,03. Ce résultat indique que les participants ayant obtenu un plus haut score ont 1,03 fois de poursuivre l'activité physique en phase de maintien que ceux qui ne l'ont pas poursuivie, en contrôlant pour tous les autres facteurs inclus dans le modèle. Le rapport de cote de 1,03 pour l'âge indique que, pour chaque année supplémentaire, les patients ont 1,03 fois plus de chances de poursuivre l'activité physique en phase de maintien. En ce qui a trait à la variable sexe, on remarque que le rapport de cote est inférieur à 1, soit 0,63. Pour une interprétation plus poussée, il est possible d'inverser les rapports de cote, en divisant 1 par 0,63, ce qui nous donne 1,57. Cela signifie donc que les participantes (femmes) ont 1,57 fois plus de chances de poursuivre l'activité physique en phase de maintien que les hommes. Le rapport de cote pour le nombre total de facteurs de risque est de 1,15, ce qui veut dire que, pour chaque facteur de risque supplémentaire, les participants ont 1,15 fois plus de chances de poursuivre l'activité physique en phase de maintien. Deux facteurs de risque se sont avérés significatifs, à savoir les antécédents familiaux χ^2 (1, n = 474) = 6,77, p = 0,01 et le tabagisme χ^2 (1, n = 474) = 10,82, p = 0,00. On remarque que la présence d'antécédents familiaux est davantage fréquente chez les participants qui maintiennent l'activité physique que chez ceux qui ne la maintiennent pas. Il est possible de noter que la présence de tabagisme est peu fréquente et ce, pour les deux groupes. Toutefois, en termes de proportion, le tabagisme est moins fréquent dans le groupe qui maintient l'activité physique que dans celui qui ne la maintient pas.

Quant aux résultats des variables psychosociales, le composant *rôle physique* révèle une différence significative entre le groupe de maintien (M = 44,32, É.T. = 43,72) et le groupe de non-maintien (M = 24,36, É.T. = 35,1), t (526) = 2,656, p = 0.003. Ainsi, les participants appartenant au groupe de maintien de l'activité physique dans le programme *Cœur en santé* tendent à avoir un score plus élevé sur la sous-échelle *rôle physique* que ceux du groupe de non-maintien. Cela signifie que les participants qui maintiennent l'activité physique considèrent leur capacité à effectuer leurs activités quotidiennes comme étant relativement bonne. Quant aux participants qui ne maintiennent pas l'activité physique, ils considèrent leur capacité à effectuer leurs activités quotidiennes comme étant faible en raison de leur état de santé physique. Pour ce qui est de la composante *santé générale*, il y a une différence significative entre le groupe de maintien (M = 64,5, É.T. = 19,3) et le groupe de non-maintien (M = 55,6, É.T. = 22,1), t (526) = 2,507, p = 0.013. Les participants du groupe de maintien tendent à avoir un score plus élevé sur la sous-échelle *Santé générale* que ceux du groupe de non-maintien. Ainsi, les personnes qui maintiennent l'activité physique sont celles qui évaluent leur état de santé comme étant relativement bon, contrairement à celles qui ne la maintiennent pas. Ces dernières évaluent leur état de santé comme étant pauvre et croient qu'il est probable que leur état de santé ne va qu'empirer.

Discussion

Les principaux résultats montrent que les patients susceptibles de ne pas maintenir l'activité physique sont ceux qui sont plus jeunes, qui sont des hommes, qui ne présentent que quelques facteurs de risque et qui ont un score plus faible sur l'échelle sommaire de qualité de vie physique. Les résultats

indiquent que ce sont plutôt les patients plus âgés et qui sont des femmes qui ont tendance à maintenir l'activité physique en phase de maintien au sein du programme *Cœur en santé*, ce qui rejoint les résultats de Bock et al. (1997) qui ont constaté que les participants qui abandonnaient en phase de maintien étaient surtout les patients plus jeunes et ceux qui avaient un emploi. Cependant, par rapport à l'âge, ces résultats entrent en contradiction avec ceux obtenus par Dolansky, Stepanczuk, Charvat et Moore (2010), qui ont conclu que les hommes âgés (70 ans et plus) maintiennent l'activité physique moins que les plus jeunes (60 ans et moins). En ce qui concerne le sexe des participants, les résultats obtenus dans la présente étude rejoignent ceux de Dolansky et ses collègues (2010), qui ont observé que les femmes âgées (70 ans et plus) maintenaient davantage l'activité physique en phase III que les hommes âgés.

Les symptômes dépressifs mesurés par le BDI et la qualité de vie mentale mesurée par le score sommaire mental du SF-36 n'ont pas contribué de façon significative au modèle en ce qui a trait à la capacité de prédiction de l'appartenance aux groupes. Cela pourrait être attribuable au fait qu'au départ, à leur entrée au programme de réadaptation cardiaque en phase d'intervention, la majorité des patients de l'échantillon présentaient peu ou pas de symptômes dépressifs. Il en va de même pour la qualité de vie mentale où la majorité des patients ont obtenu des scores plutôt élevés sur l'échelle sommaire mentale, reflétant une assez bonne qualité de vie mentale.

Le score sommaire physique du SF-36, qui mesure la qualité de vie physique ainsi que le nombre de facteurs de risque, a contribué significativement à prédire l'appartenance aux groupes. Tout d'abord, plus le score sommaire physique est élevé et plus le patient a de chances d'appartenir au groupe de maintien. En d'autres mots, meilleure était la qualité de vie physique au début du programme en phase II plus les patients avaient tendance à maintenir l'activité physique une fois la phase II terminée.

Tel que nous l'avons mentionné dans la section précédente, les participants qui maintiennent l'activité physique considèrent leur capacité à effectuer leurs activités quotidiennes comme étant relativement bonne. Quant aux participants qui ne maintiennent pas l'activité physique au sein du programme, ils considèrent leur capacité à exécuter leurs activités quotidiennes comme étant faible en raison de leur état de santé physique. La composante *santé générale* renvoie à la perception qu'une personne a de son propre état de santé en général. Les résultats indiquent que les patients appartenant au groupe de maintien ont obtenu un score supérieur sur cette composante comparativement à ceux du groupe de non-maintien. Ainsi, les personnes qui maintiennent l'activité physique au sein du programme sont celles qui évaluent leur état de santé comme étant relativement bon, contrairement à celles qui ne la maintiennent pas. Ces dernières évaluent leur état de santé comme étant pauvre et croient qu'il est probable que leur état de santé ne va qu'empirer.

Le nombre de facteurs de risque s'est avéré être une variable significative dans la prédiction de l'appartenance aux groupes. Le groupe ayant le plus grand nombre de facteurs de risque est celui qui maintient l'activité physique. Nous aurions pu être portés à croire que plus une personne a de facteurs de risque, plus elle aura de changements d'habitudes de vie à faire et plus il lui sera difficile de maintenir les comportements associés aux nouvelles habitudes de vie. Ce résultat indique donc que les patients les plus susceptibles de revivre une maladie cardiovasculaire sont ceux qui maintiennent le plus l'activité physique. Autrement dit, les patients qui maintiennent l'activité physique sont ceux qui en ont le plus besoin. Ce résultat rejoint ceux d'études précédentes portant sur la participation en phase II en ce qui a trait à la perception ou à la prise de conscience des conséquences de leur maladie (French, Cooper et Weinman, 2006; Taylor, Wilson et Sharp, 2011). Ainsi, les patients qui percevaient leur maladie comme étant grave ou comme ayant des conséquences importantes ont davantage adhéré à la phase d'intervention.

Lorsqu'on observe les résultats des analyses *post-hoc* portant sur les facteurs de risque, on remarque que les antécédents familiaux différencient les deux groupes. On retrouve davantage d'antécédents familiaux chez les participants qui maintiennent l'activité physique que chez ceux qui ne la maintiennent pas. Il est possible que la connaissance de leur vulnérabilité génétique aux maladies cardiovasculaires incite les premiers à maintenir l'activité physique. En ce qui concerne le tabagisme, même si la présence du tabagisme est peu fréquente chez les deux groupes, nous notons une importante différence de 10,5 % entre les groupes. La présence du tabagisme est significativement moins fréquente dans le groupe de maintien. Une explication possible tiendrait à ce que les patients qui maintiennent l'activité physique sont plus enclins à suivre les recommandations qui leurs sont faites par les professionnels de la santé, notamment l'arrêt du tabagisme. Les autres facteurs de risque, à savoir l'hypertension, l'obésité, la dyslipidémie, le diabète, le stress et la sédentarité, ne se sont pas avérés significatifs. Puis, en ce qui a trait à la sédentarité, les résultats indiquent que ce n'est pas un facteur de risque qui différencie les personnes maintenant l'activité physique de celles qui ne la maintiennent pas. Une explication possible serait que les personnes sédentaires n'ont peut-être jamais amorcé le programme de réadaptation cardiaque, ce qui nous ramène avec un échantillon composé de patients plus ou moins actifs. Le diabète, la dyslipidémie et l'obésité sont des facteurs de risque qui peuvent être modifiés par des changements dans les habitudes de vie, tels que l'activité physique et l'alimentation. Ces facteurs de risque s'étant avérés non significatifs, ils ne différencient pas les participants qui maintiennent l'activité physique de ceux qui ne la maintiennent pas. Toutefois, il se pourrait que ces facteurs

différencient les patients qui adhèrent à la phase II de ceux qui n'y adhèrent pas.

La principale implication pratique de la présente étude est que celle-ci permet de dresser un profil des patients susceptibles de ne pas maintenir l'activité physique après la phase d'intervention du programme de réadaptation cardiaque de manière à conserver les bienfaits acquis, d'améliorer leur qualité de vie et de prévenir la récurrence d'une maladie cardiovasculaire et la mortalité.

Une application clinique possible pourrait consister en un suivi téléphonique auprès des patients qui ont terminé la phase d'intervention du programme de réadaptation cardiaque et qui ne poursuivent pas la phase de maintien. Riegel, Carlson, Kopp, LePetri, Glaser et Unger (2002) ont examiné l'impact d'un suivi téléphonique dans le contexte de la phase d'intervention. Ils ont obtenu comme résultat une diminution des coûts associés à la réhospitalisation et à l'utilisation des services de la santé.

La présente étude comporte certaines limites, la première étant attribuable au fait qu'elle repose sur une analyse secondaire des données. Comme le mentionne Dale (1993), cela signifie que le chercheur n'a aucun contrôle sur l'élaboration des questionnaires ni sur la collecte des données. Il est donc possible que des erreurs se soient glissées et que le chercheur n'en soit pas conscient.

Une deuxième limite tient au faible nombre de personnes ayant déclaré des symptômes dépressifs, puisque ceci ne permet pas d'identifier le rôle de la dépression dans le maintien. La dépression est une variable médiatrice, ainsi il est possible que les patients présentant des symptômes dépressifs et une mauvaise qualité de vie mentale n'entament pas la réadaptation cardiaque en phase II. L'échantillon présente donc au préalable une assez bonne qualité de vie mentale et, dès lors, il est difficile de se prononcer sur l'effet qu'ont la qualité de vie mentale et la dépression sur le maintien de l'activité physique.

Il serait intéressant d'étudier l'effet de la phase de maintien sur la récurrence des maladies cardiaques et la mortalité afin d'évaluer l'efficacité de cette troisième phase de la réadaptation cardiaque au chapitre de la prévention. L'auto-efficacité semble être un concept clé pour favoriser le maintien des nouvelles habitudes de vie saines. Cependant, comme il est mentionné dans l'étude de Luszczynska et Sutton (2006), il est important de préciser le type d'auto-efficacité. Or, ces études demeurent relativement peu nombreuses à l'heure actuelle et méritent qu'on s'y attarde dans le processus de maintien des nouvelles habitudes de vie saines chez les patients atteints de maladies cardiovasculaires.

Il serait important d'étudier le maintien en fonction des autres facteurs favorisant la santé, notamment la nutrition et les connaissances au sujet des maladies cardiovasculaires, l'activité physique ne représentant qu'un seul de ces facteurs. De plus, il serait important d'approfondir le rôle de l'anxiété sur le maintien de l'activité physique.

La présente étude comporte des applications d'ordre pratique, en ce sens qu'elle permet, d'une part, d'identifier les patients qui pourraient être susceptibles de ne pas maintenir l'activité physique et, d'autre part, de mettre en place des interventions personnalisées pour ces patients. Dans ce cas, l'infirmière praticienne peut jouer un rôle important afin de faciliter le maintien d'habitudes de vie saines tel que proposé par Farrell et Keeping-Burke (2014). Également, Cicolini et al. (2013) ont démontré l'efficacité d'un système de rappel par courriel mené par les soins infirmiers afin de mieux contrôler les facteurs de risque cardiovasculaire. Donc, un système de suivi par courriel dirigé par le personnel des soins infirmiers pourrait inciter les participants à risque à maintenir leurs habitudes de vie saines après la phase d'intervention.

Ces stratégies de prévention dans le cadre des soins infirmiers méritent qu'on s'y attarde davantage compte tenu de l'importance du maintien de l'activité physique dans la prévention de la récurrence des maladies cardiovasculaires et de la mortalité. ♥

Au sujet des auteurs

Raphaël Mignault-Laplante, Hôpital Régional Chaleur Regional Hospital, 1750, promenade Sunset Drive, Bathurst, NB E2A 4L7

Tél. / Tel.: 506-544-2306 • Téléc. / Fax: 506-544-3456
raphael.mignault-laplante@vitalitenb.ca

Paul-Émile Bourque, Ph.D., L.Psych., 102, Jacqueline Bouchard Building, University of Moncton, Moncton, NB ElA 3E9

Tél : 506 858 4945
Courriel : ***bourqup@umoncton.ca***

***Auteur de correspondance**
Sarah Pakzad, Ph.D., L.Psych., 531, Taillon, Université de Moncton, Moncton, NB E1A 3E9

Tél : 1 (506) 858 4245, ***sarah.pakzad@umoncton.ca***

RÉFÉRENCES

Association canadienne de prévention et de réadaptation cardiovasculaires (2011). Consulté de http://www.cacr.ca

Balady, G.J., Ades, P.A., Comoss, P., Limacher, M., Pina, I.L., Southard, D., … Bazzarre, T. (2000). Core components of cardiac rehabilitation/secondary prevention programs: A statement for healthcare professionals from the American Heart Association and the American Association of Cardiovascular and Pulmonary Rehabilitation. *Circulation, 102*, 1069–1073.

Beck, A.T. et Steer, R.A. (1978). *Beck Depression Inventory*. San Antonio, TX: The Psychological Corporation: Hartcourt Brace & Company.

Beck, A.T., Steer, R.A. et Carbin, M.G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review, 8*(1), 77–100.

Bock, B.C., Albrecht, A.E., Traficante, R.M., Clark, M.M., Pinto, B.M., Tilkemeier, P., … Marcus, B.H. (1997). Predictors of exercise adherence following participation in a cardiac rehabilitation program. *International Journal of Behavioral Medicine, 4*(1), 60–75.

Bock, B.C., Carmona-Barros, R.E., Esler, J.L. et Tilkemeier, P.L. (2003). Program participation and physical activity maintenance after cardiac rehabilitation. *Behavior Modification, 27*(1), 37–53.

Boesch, C., Myers, J., Habersaat, A., Ilarraza, H., Kottman, W. et Dubach, P. (2005). Maintenance of exercise capacity and physical activity patterns 2 years after cardiac rehabilitation. *Journal of Cardiopulmonary Rehabilitation and Prevention, 25*(1), 14–21.

Boulay, P. et Prud'homme, D. (2004). Health-care consumption and recurrent myocardial infarction after 1 year of conventional treatment versus short- and long-term cardiac rehabilitation. *Preventive Medicine, 38*(5), 586–593.

Bourque, P. et Beaudette, D. (1982). Étude psychométrique du questionnaire dépression de Beck auprès d'un échantillon d'étudiants universitaires francophones. *Canadian Journal of Behaviour Sciences, 14*(3), 212–217.

Brubaker, P.H., Warner, J.G. Jr, Rejeski, W., Edwards, D.G., Matrazzo, B.R., Ribisl, P.M., … Herrington, D.M. (2004). Comparison of standard- and extended-length participation in cardiac rehabilitation on body composition, functional capacity, and blood lipids. *The American Journal of Cardiology, 78*(7), 769–773.

Carmody, T.P., Senner, J.W., Manilow, M.R. et Matarazzo, J.D. (1980). Physical exercise rehabilitation: Long-term dropout rate in cardiac patients. *Journal of Behavioral Medicine, 3,* 163–168.

Cicolini, G., Simonetti, V., Comparcini, D., Celiberti, I., Di Nicola, M., Capasso, L.M., Flacco, M.E., … Manzoli, L. (2013). Efficacy of a nurse-led email reminder program for cardiovascular prevention risk reduction in hypertensive patients: Randomised controlled trial. *International Journal of Nursing Studies*, http: //dx.doi.org/10.1016/j.ijnurstu.2013.10.010

Dale, A. (1993). Le rôle de l'analyse secondaire dans la recherche en sciences sociales. *Sociétés contemporaines, 14*(14–15), 7–21.

Dempster, M. et Donnelly, M. (2000). Measuring the health related quality of life of people with ischaemic heart disease. *Heart, 83*, 641–644.

Dolansky, M.A., Stepanczuk, B., Charvat, J.M. et Moore, S.M. (2010). Women's and men's exercise adherence after a cardiac event: Does age make a difference? *Research in Gerontological Nursing, 3*(1), 30–38.

Farrell, T.C. et Keeping-Burke, L. (2014). The primary prevention of cardiovascular disease: Nurse practitioners using behaviour modification strategies. *Canadian Journal of Cardiovascular Nursing, 24*(1), 8–15.

French, D.P., Cooper, A. et Weinman, J. (2006). Illness perceptions predict attendance at cardiac rehabilitation following acute myocardial infarction: A systematic review with meta-analysis. *Journal of Psychosomatic Research, 61*(6), 757–767.

Gupta, R., Sanderson, B.K., Bittner, R.N. et Vera, M.D. (2007). Outcomes at one-year follow-up of women and men with coronary artery disease discharged from cardiac rehabilitation: What benefits are maintained? *Journal of Cardiopulmonary Rehabilitation & Prevention, 27*(1), 11–18.

Hevey, D., McGee, H.M. et Horgan, J. (2007). Relationship of initial level of distress to changes in health-related quality of life during cardiac rehabilitation or usual care. *Psychosomatic Medicine*, 69(8), 793–797.

Hopman, W.M., Towheed, T., Anastassiades, T., Tenenhous, A., Poliquin, S., Berger, C., … Papadimitropoulos, E. (2000). Canadian normative data for the SF-36 health survey. *Canadian Medical Association Journal, 163*(3), 265–271.

Hughes, A. et Mutrie, N. (2006). Maintaining physical activity in cardiac rehabilitation. Dans M. Thow, *Exercise Leadership in Cardiac Rehabilitation: An Evidence-Based Approach* (pp. 195–215). England: Wiley.

Kerins, M., McKee, G. et Bennett, K. (2011). Contributing factors to patient non-attendance at and non-completion of phase III cardiac rehabilitation. *European Journal of Nursing, 10*(1), 31–36.

Leplège, A., Écosse, E., Verdier, A. et Perneger, T. (1998). The French SF-36 health survey: Translation, cultural adaptation, and preliminary psychometric evaluation. *Journal of Clinical Epidemiology, 5*(11), 1013–1023.

Luszczynska, A. et Sutton, S. (2006). Physical activity after cardiac rehabilitation: Evidence that different types of self-efficacy are important in maintainers and relapsers. *Rehabilitation Psychology, 51*(4), 314–321.

Olridge, N.B. (1991). Cardiac rehabilitation services: What are they and are they worth it? *Comprehensive Therapy, 17*, 59–66.

Olridge, N.B. et Streiner, D.L. (1990). The health belief model: Predicting compliance and dropout in cardiac rehabilitation. *Medicine & Science in Sports and Exercise, 22*(5), 678–683.

Pinto, B.M., Goldstein, M.G., Papandonatos, G.D., Farrell, N., Tilkemeier, P., Marcus, B.H., … Todaro, J.F. (2011). Maintenance of exercise after phase II cardiac rehabilitation: A randomized controlled trial. *American Journal of Preventive Medicine, 41*(3), 274–283.

Riegel, B., Carlson, B., Kopp, Z., LePetri, B., Glaser, D. et Unger, A. (2002). Effect of a standardized nurse case-management telephone intervention on resource use in patients with chronic heart failure. *Archives of Internal Medicine, 162*(6), 705–712.

Seki, E., Watanbe, Y., Sunayama, S., Iwama, Y., Schimada, K., Kawakami, K., … Daida, H. (2003). Effects of phase III cardiac rehabilitation programs on health-related quality of life in elderly patients with coronary artery disease: Juntendo Cardiac Rehabilitation Program (J-CARP). *Circulation Journal, 67*(1), 73–77.

Taylor, G.H., Wilson, S.L. et Sharp, J. (2011). Medical, psychological, and sociodemographic factors associated with adherence to cardiac rehabilitation programs: A systematic review. *Journal of Cardiovascular Nursing, 26*(3), 202–209.

Vandal, S., Bradet, R., Viens, C. et Robichaud-Ekstrand, S. (1999). Adoption and maintenance of health behavior: The challenge of treatment compliance. *Recherche en soins infirmiers, 58*, 103–113.

Ware, J.E. et Kosinski, M. (2001). *SF-36 physical and mental health summary scales: A manual for users version 1* (2e éd.). Lincoln, RI: QualityMetric Incorporated.

Ware, J.E. et Sherbourne, C.D. (1992). The MOS 36-item short form health survey: Conceptual framework and item selection. *Medical Care, 30*(6), 473–483.

Yohannes, A.M., Doherty, P., Bundy, C. et Yalfani, A. (2010). The long-term benefits of cardiac rehabilitation on depression, anxiety, physical activity and quality of life. *Journal of Clinical Nursing, 19*(19–20), 2806–2813.

Canadian Journal of
Cardiovascular
Nursing

Author Guidelines

Information for Authors

The Canadian Journal of Cardiovascular Nursing (CJCN) publishes four issues annually, featuring articles in both French and English. CJCN welcomes original articles dealing with research findings or issues relating to cardiovascular health and illness.

The Journal provides a forum for:

- Research Papers
- Short Reports
- Reviews
- Commentaries and Responses to Commentaries
- Discourse Relevant to Cardiovascular Nursing
- Case Studies
- Arts Informed Scholarship

Letters to the Editor in response to our articles or columns are encouraged.

Manuscript Submission

The manuscript should be sent by email to: Canadian Council of Cardiovascular Nurses, email: **david@cccn.ca**

All manuscripts submitted to CJCN must include the following:

- A covering letter, stating the work has not been published and is not being considered for publication elsewhere.
- Permission from the copyright holder for any previously published material (i.e., excerpts, tables and illustrations) that appears in the manuscript.
- If the study that is being submitted is similar in any way to another study previously submitted/published or is part of multiple studies on the same topic, include a brief explanation of how the manuscript differs and that there is no identical material.
- Do not include any identifying details of the authors or their institutions in the manuscript; author details must only appear on the title page.

Manuscript Types

1. **Research Papers.** The text should be arranged as follows:
   a) Title Page
   b) Abstract
   c) Keywords
   d) Introduction
   e) Aim and Methods
   f) Results
   g) Discussion
   h) Implications for Practice
   i) Media advisory Highlights
   j) References
   k) Figures and Tables
   l) Suggested Reviewers

The maximum length for research papers is 20 double-spaced pages (excluding title page, abstract, keywords, suggested reviewers, and media advisory highlights).

2. **Short Reports.** The text should be arranged as follows:
   a) Title Page
   b) Abstract
   c) Keywords
   d) Introduction
   e) Aim and Methods
   f) Results
   g) Discussion
   h) Implications for Practice
   i) Media Advisory Highlights
   j) References
   k) Figures and Tables
   l) Suggested Reviewers

These reports can include preliminary and pilot studies and should not exceed 13 double-spaced pages (excluding title page, abstract, keywords, suggested reviewers, and media advisory highlights).

3. **Reviews.** Qualitative and quantitative literature reviews on any area of research relevant to cardiovascular nursing are welcomed. The text should be arranged as follows:
   a) Title Page
   b) Abstract
   c) Keywords
   d) Introduction
   e) Aim and Methods
   f) Results
   g) Discussion
   h) Implications for Practice
   i) Media Advisory Highlights
   j) References
   k) Figures and Tables
   l) Suggested Reviewers

Submissions should not exceed 20 double-spaced pages (excluding title page, abstract, keywords, suggested reviewers, and media advisory highlights). Authors are advised to explain their methodology clearly (e.g., overall approach, literature search strategies, data analysis). The PRISMA checklist and flow diagram should be used to guide manuscript development. Systematic review methods are evolving and authors are urged to cite supporting references.

4. **Commentaries and Responses to Commentaries.** The text should be arranged as follows:
   a) Title Page
   b) Abstract
   c) Keywords
   d) Introduction
   e) Aim and Methods
   f) Results
   g) Discussion
   h) Implications for Practice
   i) Media Advisory Highlights
   j) References
   k) Figures and Tables
   l) Suggested Reviewers

These should be no more than 1,000 words in length with a maximum of five references (excluding title page, abstract, keywords, suggested reviewers, and media advisory highlights) and should offer a critical but constructive perspective on the published paper.

5. **Discourses Relevant to Cardiovascular Nursing.** Discourses relevant to cardiovascular nursing, including position papers and critical reviews of particular bodies of work, which do not contain empirical data or use systematic review methods are also welcome. The text should be arranged as follows:
   a) Title Page
   b) Abstract
   c) Keywords
   d) Introduction
   e) Aim (stating that it is a position paper or critical review)
   f) Method (how the issues were approached)
   g) Conclusions
   h) Relevance to Clinical Practice
   i) Media Advisory Highlights
   j) References
   k) Figures and Tables
   l) Suggested Reviewers

Submissions should not exceed 20 double-spaced pages (excluding title page, abstract, keywords, suggested reviewers, and media advisory highlights).

6. **Case studies.** Case study papers that describe current cardiovascular nursing practice problems with depth and specificity for the practising nurse are welcome. For example:
   i. Describe the implementation of new nursing technique or clinical equipment
   ii. Provide current evidence-based research/standards/guidelines on cardiovascular disease management, specific diagnosis, and related care and treatment
   iii. Provide insight into the behaviour of the cardiovascular patient, family, or nurse
   iv. Offer new solutions to old problems (i.e., helpful hints are welcome)
   v. Describe creative programs and evaluations related to all aspects of care of the cardiovascular patient, student experience, and resources that address cardiovascular practice.

Manuscript should not exceed 13 double-spaced pages (excluding title page, abstract, keywords, suggested reviewers, and media advisory highlights).

7. **Arts Informed Scholarship.** Narrative reflections that draw upon arts-based media which may include: poetry, paintings, and/or photography and focus on the cardiovascular encounter. Manuscripts should not exceed 20 pages (excluding title page, abstract, keywords, suggested reviewers, and media advisory highlights).

Manuscript Preparation

Format

Manuscripts should be typed double-spaced in a standard letter quality font. Side margins should measure 2.5 cm. The manuscript length includes tables, figures, illustrations and references. (Compute the graphics as equivalent to one half or one full size page depending on anticipated size when published.)

Text Style

Prepare your manuscript in accordance with the style outlined in the American Psychological Association's Publication Manual (6th ed.)

Follow the APA guidelines for grammar, punctuation, gender neutral language, references and citations. Two exceptions from APA are the spelling (should be current Canadian use where applicable), and the abstract should be a maximum of 150 words.

Tables, graphs, illustrations: Prepare in accordance with the APA style. Each table, figure or illustration should be submitted on a separate sheet and numbered as it appears in the manuscript (e.g., Figure 1). Illustrations should be computer- generated or professionally drawn. Images should be in electronic form, high resolution (300 DPI).

Reference List: CJCN uses a reference list (not a bibliography). Refer to the APA style.

Title Page

An identifying title page should include: manuscript title, names, credentials, title, and affiliation of all authors. The corresponding author should indicate a telephone number, email and mailing addresses.

Four to five keywords from the CINAHL Subject Heading list should appear on the title page.

Acknowledgements

Other contributing individuals and sources of research funding that resulted in this manuscript may appear in the acknowledgement section of the paper.

Suggested Reviewers

The name and email address of two potential reviewers should be provided by all authors.

Media Advisory Highlights

A brief synopsis that highlights the main elements of the paper is required to profile the manuscript on the Canadian Council of Cardiovascular Nurses social media accounts (i.e., monthly newsletter, facebook). The media advisory highlight is to be presented on a separate page, just before the references, following the main text; in the form of 2-3 bulleted sentences that highlight the main points of the manuscript.

Review Procedure

Manuscripts for original articles are reviewed anonymously by peers for content and clarity. If the peer reviewers recommend publishing with content revisions, the manuscript will be forwarded to the author with a deadline for the return of the revised paper by email.

Expected timeline from submission to response is eight weeks.

Copy Editing

Accepted articles are subject to copy editing.

Copyright

It is understood that if the article is published, the Canadian Journal of Cardiovascular Nursing will have exclusive rights to it and to its reproduction and sale.

Check the CJCN web page for a PowerPoint Presentation with further information for authors: **www.cccn.ca/content.php?doc=21** ♥

CALL FOR NOMINATIONS FOR THE BOARD OF DIRECTORS

Members of the Canadian Council of Cardiovascular Nurses in good standing are invited to nominate members for the following positions:

President-Elect

Leads CCCN as a member of the Board of Directors by shadowing the President in their activities in preparation for assuming the role of President. This also includes providing Board orientation to Board members assuming the President-Elect's previous role on the Board (if applicable).

Key duties and responsibilities:

- Prepare to assume the role of President by shadowing the President in their activities.
- Provide orientation to Board members assuming the President-Elect's previous role on the Board (if applicable).
- Serve as a member of the Awards Committee
- Recommend screened award nominees for Board approval
- Organize and manage the CCCN's historical records

Director of Professional Development

Leads CCCN as a member of the Board of Directors managing and reporting on CCCN's professional education activities, to chair the National Professional Education Committee and in partnership with an Association Management Firm work to achieve CCCN's professional education objectives.

Key duties and responsibilities:

- Chair the National Professional Education Committee
- Chair the National Annual Spring Conference Committee
- Organize and manage the Spring Nursing Conference with the Association Management firm
- Recommend to the Board potential corporate sponsors
- Organize and manage initiatives relating to professional education/practice
- Act as the main liaison between the Board and clinical affiliations (e.g., CANCARE)
- Chair CCCN Standards Committee
- Recommend to the Board any revisions to CCCN's Standards
- Act as the main liaison between the Board and CNA regarding Cardiovascular (CV) Certification

Director of Health Promotion

Leads CCCN as a member of the Board of Directors managing and reporting on CCCN's health promotion and advocacy activities, chairs the National Health Promotion and Advocacy Committee and, in partnership with an Association Management Firm, works to achieve CCCN's health promotion and advocacy objectives.

Key duties and responsibilities:

- Chair the National Health Promotion and Advocacy Committee
- Recommend to the Board campaigns/initiatives that demonstrate enactment of "Health Promotion Starts With Us"
- Organize and manage approved National Health Promotion and Advocacy campaigns/initiatives
- Recommend to the Board strategic alliances with appropriate "Risk Reduction" industries (e.g., food, environment, fitness)
- Recommend to the Board "Going Green" strategies
- Organize and manage CCCN's efforts at "Going Green"
- Act as the main liaison between the Board and strategic partnerships such as but not limited to the Heart & Stroke Foundation of Canada and CNA regarding Health Promotion and Advocacy work
- Prepare Health Promotion and Advocacy-related position statements (e.g., hypertension, sodium reduction, smoking, health literacy, etc.)
- Collaborate/participate in appropriate Health Promotion and Advocacy initiatives/committees with outside agencies (e.g., Hypertension Canada, etc.)
- Participate in planning the Annual Spring Nursing Conference and the National Scientific Sessions
- Organize and manage the health promotion activity and speakers for CCCN conferences

Director of National Scientific Sessions

Leads CCCN as a member of the Board of Directors managing and reporting on CCCN's National Scientific Sessions, chairs the National Scientific Sessions Committee and, in partnership with an Association Management Firm, works to hold a successful event.

Key duties and responsibilities:

- Chair the National Scientific Sessions Committee
- Organize and manage the National Scientific Sessions and CCCN's involvement in Congress
- Recommend to the Board slate of keynote/plenary speakers
- Recommend to the Board potential corporate sponsors
- Act as the main liaison between the Board and the Canadian Cardiovascular Congress (CCC) and their affiliates
- Collaborate/participate in CCC planning meetings

All nominations shall be accompanied by the signed consent of the nominated member and a signature of a member in good standing supporting the nomination.

Nominees must be members in good standing with the Canadian Council of Cardiovascular Nurses. The nominees must be prepared to serve a three-year term commencing after the first board meeting following the Annual General Meeting.

All nominations must be received by **May 2, 2016,** to be valid. Nominations will **NOT** be accepted from the floor at the Annual General Meeting.

For a copy of the nominations/consent form, please go to: **http://www.cccn.ca/media.php?mid=1041**

Canadian Council of Cardiovascular Nurses

Conseil canadien des infirmières(iers) en nursing cardiovasculaire

Canadian Journal of Cardiovascular Nursing (CJCN)

Visit: www.cccn.ca

About CJCN

♥ CJCN is published four times each year, featuring articles in both French and English. CJCN welcomes original articles dealing with research findings or issues relating to **cardiovascular** health and illness.

Manuscript submission

Manuscripts should be sent by email to:

Canadian Council of Cardiovascular Nurses. **Email:** david@cccn.ca

Why consider publishing?

♥ Share your knowledge with a larger audience
♥ Optimize your visibility and expertise in the area of cardiovascular nursing
♥ Improve patient and family care
♥ Enhance your opportunity for graduate school admission
♥ Increase your employment prospects
♥ Enrich your curriculum vitae

For more information

Please review the ***Author Guidelines*** which can be found at www.cccn.ca. Alternatively, please email david@cccn.ca for a copy of these guidelines.

images obtained from: freedigitalphotos.net

Sharing the Facts on Fibre Could Help Save Millions in Healthcare Costs

New research reveals that increasing fibre intake is a healthy investment. A study conducted by the Richardson Centre for Functional Foods and Nutraceuticals at the University of Manitoba shows that **if Canadian adults increased their intake of cereal fibre by just 1 gram per day, annual healthcare costs related to cardiovascular disease and type 2 diabetes could be reduced by up to $143.2 million.**

"The results of this cost-of-illness analysis sheds light on the benefits of cereal fibre in the prevention and management of these chronic diseases," said Dr. Peter Jones, Canada Research Chair in Functional Foods and Nutrition at the University of Manitoba, and Director of the Richardson Centre for Functional Foods and Nutraceuticals, and lead researcher. "Given the health benefits of fibre and the vast potential savings for the healthcare system, it's imperative that Canadian healthcare providers include fibre recommendations when counselling their patients on nutrition and diet."

The health benefits of a high-fibre diet are already well-recognized. Dietary fibre has been associated with a lower prevalence of type 2 diabetes and cardiovascular disease, as well as a reduced risk of digestive disorders and obesity. Diets with higher levels of cereal fibre, which is found in cereal grains like oats and wheat, are associated with the lowest risks of cardiovascular disease, and type 2 diabetes, as compared to fibre from vegetables or fruit. The protective effects of this "powerhouse" nutrient are related to its ability to lower cholesterol, improve blood sugar control, promote regularity and increase satiety to assist with weight management.

Despite the health benefits of fibre and the potential impact on Canada's healthcare costs, many Canadians do not get enough fibre.

Average fibre intakes are only about half of Health Canada's recommendations of 25 grams of fibre per day for women and 38 grams per day for men.

Nurses play a key role in educating their patients on the health benefits of a high-fibre diet and providing actionable strategies and tips to increase their daily fibre intake.

Talk to your patients about high-fibre foods like **Kellogg's* All Bran Buds*** that can be incorporated into everyday recipes.

For more information about the benefits of dietary fibre, the impact that fibre can have on healthcare system costs and for tools to support counselling with your patients visit **startwithfibre.ca.**

Kellogg's* All-Bran Buds* cereal is one of the simplest and most effective ways to help your patients get more fibre. It provides 11 grams of fibre and 70 calories in just a 1/3 cup, and contains a unique combination of psyllium and wheat bran fibres. Psyllium fibre has been shown to lower cholesterol and improve blood sugar control, and wheat bran is the best fibre to promote regularity.

Kellogg's* All-Bran Buds* cereal can be easily added to many everyday foods and dishes that your patients already eat. It's ideal for mixing with yogurt and other cereals, and is a great way to boost the fibre in a variety of different recipes. Please find delicious recipe ideas at **allbran.ca.**

Kellogg's All-Bran

References available at **startwithfibre.ca.**

The annual CCCN spring conference brings together local, national and international professionals and stakeholders to discuss, identify and propose strategies to address the challenges connected with cardiovascular health. An opportunity for knowledge exchange and networking with a variety of stakeholders including cardiovascular nurses, primary care providers, cardiac rehabilitation and allied health professionals.

Registration

	1 Day	2 Day
Student Nurses	$75.00	$150.00
CCCN Members	$125.00	$200.00
Allied Health Professionals	$150.00	$250.00
Non-members	$175.00	$300.00

15% HST not included

Register before April 22, 2016 for your chance to win 1 of 3 $25 gift cards or 1 complimentary conference guest room night!

CCCN guest room rate: $139+HST
reservations@atlanticahalifax.com

Spring Conference Program

This two-day event will feature a combination of plenary and break-out sessions along with great networking opportunities. **Visit cccn.ca to view the educational program.**

Networking Activities

A variety of tours and social activities are available. Join us on Friday night at "Durty Nelly's Irish Pub" for an evening of networking and music.

Register at www.cccn.ca **Email: info@cccn.ca**

Canadian Council of Cardiovascular Nurses / Conseil canadien des infirmières et infirmiers en soins cardiovasculaires

Canadian Council of Cardiovascular Nurses
202-300 March Road, Ottawa, ON K2K 2E2
Tel: 613-599-9210