Patients' Perception of Their Experience of Primary Percutaneous Intervention for ST Segment Elevation Myocardial Infarction

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Abstract

The preferred treatment for patients experiencing ST segment elevation myocardial infarction (STEMI) has evolved over the past 5 years with primary percutaneous intervention (PCI) as the current acceptable treatment. Because of this, patients are spending significantly less time in hospital. The purpose of this literature review was to explore *patients’ perceptions of their experience* of receiving primary percutaneous intervention (PCI) as a treatment for STEMI. The literature reviewed consisted of 11 papers, comprised of original research and other sources. Studies were critiqued and graded for relevancy to aid in the review. Key findings from the literature indicate that perception of this experience varies among patients and may not resonate with what actually happened. Recommendations for action include improving the nurses’ assessments of the patients’ perception of the experience so that patient and family education can be tailored to meet individual needs. Advance practice nurses, it is posited play a key role as educators in leading change in this situation.

Despite ongoing research, cardiovascular disease (CVD) remains one of the leading causes of death in the world (Mendis et al., 2007). Nurses are key members of cardiovascular care teams assuming a number of roles in caring for patients and their families as they face the numerous challenges of living with CVD. A key role for nurses is the educative role. In enacting this role, what is essential is for nurses to assist for patients and their families is to come to an understanding of CVD as a progressive, degenerative disease. Interventions to reverse the effects of CVD may reduce the risk of death and infirmity, however, having such a serious chronic condition may affect the patient and families' quality of life and/or may lead to premature death, in spite of pharmacological measures and revascularization strategies that decrease symptoms and help prevent sudden cardiac or cerebral death (Hatchett & Thompson, 2002). To place the magnitude of the disease into context, according to the World Health Organization (as cited in Mendis et al.), 35 million deaths occur globally every year due to chronic diseases. CVD is the cause of 30 millions of these deaths, or 52% of all global deaths from chronic disease. Of all deaths worldwide, CVD accounts for approximately 60% (Mendis et al.). Thus, the scope of CVD is not only immense but widespread, and is evident not only at the global level but also at national, and local levels. Organizations such as the World Health Organization and the Heart and Stroke Foundation of Canada (HSFC) have long persisted in strengthening primary prevention of CVD on the global, national and, for the HSFC at local levels. While evidence continues to accumulate that healthy lifestyle reduces the risk of CVD, for example, the Nurses Health Study (AHA, 2002), the need for biomedical interventions persists. Once a person with CVD has undergone a biomedical or surgical intervention for CVD, secondary prevention is the key to further risk reduction and improved quality of life (Wiles and Kinmonth, 2001) Evidence is emerging that it is people with established CVD who are most amenable to preventative care resulting in actual risk reduction (Wiles & Kinmonth). However, it appears that present day treatments for some acute manifestations of CVD such as ST segment elevation myocardial infarction (STEMI) may have an influence on an individuals understanding that they have CVD that requires management (Astin et al., 2008b). In 2004 in the health region where I practice, a protocol for primary percutaneous coronary intervention (PCI) was introduced to address the health issue of STEMI. It is important to clarify that STEMI is but one manifestation CVD amongst many, including hypertension, stroke and peripheral vascular disease. STEMI was chosen as the health issue for this project because the people receiving primary PCI as a treatment for this condition have very limited time available for nurses enacting their educative role to intervene. This project will explore patient perceptions of their experience of primary PCI for the treatment of STEMI and how this affects understanding of their CVD.

Background

The Fraser Health Region is the largest health region in British Columbia serving 1.5 million people. The region consists of 11 community hospitals and 1 tertiary centre (Fraser Health Authority, 2008a) and services 16 communities over a large geographical area (Fraser Health Authority, 2008b). Primary PCI was introduced in this health region in 2004 in response to guidelines adopted by the Canadian Cardiovascular Society (Antman et al., 2004). Primary PCI requires that the patient experiencing a STEMI be rapidly transported to a tertiary centre. The procedure involves opening up the blocked artery using miniature balloons threaded through the blocked blood vessel (Hatchett & Thompson, 2002). Prior to 2004, the main method for opening the blocked artery was to administer thrombolytic medication via an intravenous infusion. The medication would dissolve the blood clot blocking the coronary artery. Patients spent a minimum of 7 days in the hospital in the coronary care unit and experienced a prolonged recovery period. The name *primary PCI* refers to a procedure where patients receive angioplasty as the first-line treatment for STEMI as opposed to thrombolytic therapy (Antman et al.). With this treatment, patients are discharged from hospital within 48 to 72 hours. Such rapid discharge has implications for the nursing care of this patient population and their families.

To illustrate how the experience of a patient traveling through this situation may influence perception, consider the scenario of a male, aged 55 years, who develops severe chest pain in the middle of the night. He wakes up his wife and she calls 911. The ambulance rushes to the home with lights flashing and sirens blaring. The ambulance personnel arrive and administer analgesic medication and oxygen to decrease the workload on his heart. He is then transported rapidly to the tertiary hospital. Staff members, who carry pagers and have been called in, are waiting for the patient when he arrives. Fifteen minutes later the physician threads the miniature balloon through the blocked coronary (heart) artery and with the resultant restoration of blood flow, the patient's chest pain is relieved. The patient then spends the next 2 days in the coronary care unit. As noted previously, hospital discharge occurs usually within the period of approximately 48 to 72 hours. As one can imagine, 48 hours is a very short time for patients to come to understand what has occurred. Many patients have been previously unaware that they have heart disease and are now told they have had a heart attack and there are many lifestyle changes that need to occur. They also are placed on multiple medications, some of which are dangerous to discontinue because it could cause another heart attack.

At the Royal Columbian Hospital, patients receive discharge teaching from the clinical pharmacist and nurses. The prevailing thought is that patients must leave hospital with this information, as it is important so they may participate in interventions that will decrease their risk of a future event. However, currently at our institution there is no formal follow up. Nurses assuming the educative role do not know if patients are following the information they are ‘taught’. As well, nurses assuming the educative role have no idea if there truly is a reduction in the risk of a future CVD-related events at both the individual and population levels as a result of this teaching. During these ‘teaching’ sessions, nurses provide information to patients and families about medications; post angioplasty care such as the care of the insertion site; risk factors for cardiovascular disease; lifestyle modification strategies; and, discharge, for example when to visit the physician. In addition to this long list of ‘teaching’ items, patients and family members are provided with information about community supports, for example, the location of cardiac rehabilitation programs and the related referral processes. In my discussions with patients and their family members, while many understand that they now have a chronic condition to manage, there are many who do not. In fact, when I work with these patients and their family members in the educative role, it takes me back when some are shocked to learn that the patient has had a heart attack. How, I wonder, could this be when there has been such a high level of contact with health professionals during the hospitalization?

Part of the issue as I see it in my institution is that nurses have never before been invited to officially participate in the development of a secondary prevention program. Nurses are in a unique situation amongst health care professionals to engage patients in health education due to their education and philosophies. Nursing education itself includes the components of emotional support, scientific knowledge, nursing knowledge, pharmacotherapy, counseling, and motivation (Berra, Miller & Fair, 2006). This knowledge and education places nurses at the forefront of health professionals for ensuring that program and strategies for secondary prevention of CVD are effective. Nurses have the requisite knowledge to use research and theory in the practice setting (Alligood, 2002).

Dorthea Orem's self-care deficit nursing theory (SCDNT) is one theory that has specific utility in the cardiovascular setting with its focus on self-care. Timmins and Horan (2007) assert that "Orem's model has particular application in the education of nurses who will specifically work in the coronary care setting due to the shared philosophical underpinnings of self-care, empowerment, and education/support" (p.37). Orem's SCDNT focuses on the capabilities of individuals and their capacity for self-care (Jaarsma et al. 1998). Self-care is "the practice of activities that individuals initiate and perform on their own behalf in maintaining life, healthy functioning, personal development and well-being (Orem, 1995, p. 104). Of particular utility for nurses engaging in the educative role with patients who have experienced STEMI is the SCDNT concept of a deficit in self-care requiring nursing intervention. This intervention comes under the scope of the supportive/educative system within the SCDNT. In order to care effectively for patients who have experienced STEMI treated with primary PCI is the assessment of three areas that are related to patient perception of their event. According to Jaarsma et al (1998) these would include a review of (a) the patients self-care demand, or they types of care measures that are required; (b) an estimation of the self-care agency or the ability to perform activities of self-care including lifestyle modifications and; (c) a determination of any actual self-care deficits that may occur, for example the inability to read medication labels correctly. In order to enact the educative role of nurses, these self-care concepts need to be explored so that both patients and nurses are clear in terms of understanding the patient perception of the event as a starting point for effective nursing intervention.

CVD risk factor reduction education and management requires a systematic approach in which the patient, their family, and the community is involved (Berra, Miller & Fair, 2006). Advanced practice nurse (APN) educators are especially suited for this role with their nursing and educational expertise. Currently there is no advance practice nursing position within the interventional cardiology program in the Fraser Health Region. Although there is a clinical nurse specialist within the cardiac surgery program, there has never been an advanced practice nursing role within the interventional program. There are a number of reasons an advanced practice nurse educator would be beneficial in this role. APN educators are experts in meeting the health and education needs of not only individuals, but of all people, including those in groups, families, communities, and populations (Canadian Nurses Association, 2008). Through graduate level education, the APN educator has developed the knowledge necessary to lead change through the synthesis of educational and nursing theory. APN educators have the ability to plan, implement and evaluate educational programs for both nurses and patients.

Many education theories can be translated into patient education and are relevant in this situation, and it is advanced practice nurses who have knowledge pertaining to the interface between education and nursing theories. For example, it is no longer widely accepted that the traditional transmission model of teaching—which sees the student as an empty vessel waiting to be filled with the requisite knowledge—is effective (Young & Paterson, 2007). Why then would nurses attempt to educate their patients in that manner? Advanced practice nurse educators understand that learning occurs within relationships and is socially constructed (Young & Paterson).

The educative role the nurse enacts within the post primary PCI setting must be meaningful to the patient and family. There are a number of factors that may interfere with meaningful education in this patient population, including uncertainty and denial. The APN educator processes the ability to analyze these factors, assess their impact and collaborate with the multidisciplinary team to develop an educational program that is meaningful to both the patients and their families. APN educators understand the value of developing education for patients based on the principles of student or patient-centredness.

Developing an APN educator role is also important because it has been demonstrated in the literature that patients have a preference for who delivers the information. Scott and Thompson (2003) discovered that patients prefer to receive their information from a physician because it ensures the credibility and consistency of the information. Astin et al. (2008a) also determined that some patients prefer to receive information from a physician; however, many patients find the added time that nurses spend with them more of a benefit. Smith and Liles (2007) wrote, “Providing information and support to MI patients has long been identified as an important nursing function and such activity should be patient-centered and open to the learning needs of the participants” (p. 663). An advanced practice nurse would be especially suited to providing credibility and consistency, as well as the holistic focus of nursing.

Method

The format chosen for this project is an integrative review of the literature. Guidance for the review was drawn from Polit & Beck (2008) and Whittemore and Knafl (2005). I structured the review to include problem identification, a literature search, assessment of the articles for relevancy, a discussion of the findings, and recommendations for the future. Prior to inclusion in the review, I critiqued all studies for strength of evidence, methodological features, and findings using a tool adapted from Polit and Beck (2008). An example of this tool is attached as Appendix A. In general, a research critique “is a careful appraisal of the strengths and weaknesses of a study (Polit & Beck, 2008, p. 123). Further to this critique I used Whittemore and Knafl’s 2.0 system to assess the relevance of each article to the identified question guiding this inquiry. This rating system, described below is used a method for organizing the studies.

Problem Identification

The purpose of this integrative literature review is to explore the patients’ perceptions of their experience of primary PCI in the specific case of STEMI. Additionally this review of the literature will assist nurses to obtain a clearer understanding of areas that require consideration as they think before engaging in the educative role. With a deeper understanding of patient perception, this educative role can be enacted more effectively with regard to enabling the self-care of those in nurses care, thus, reducing the potential of negative long-term outcomes such as readmission for another heart attack or decreasing quality of life from advancing disease. The link between this perception and patient understanding of their CVD will also be integrated into the discussion. As well, I wonder if nurses are effective in providing education to the patients who have experienced a STEMI. Does the patient teaching carried out by nurses in this setting result in the improved self-management of risk factors and in turn improved health? What are the barriers to patients’ understandings of the educational information provided in patient teaching sessions? Is discharge the most appropriate time to do patient teaching? What about family members? What information do they require to support the patient?

The Literature Search

The literature search used the following inclusion criteria for articles: (a) written in English, (b) published after 1999, (c) described quantitative or qualitative research, including literature reviews, and (d) addressed the population of patients experiencing an acute myocardial infarction (AMI) treated with primary PCI. It became apparent relatively quickly that there was very little in the literature specific to patients treated with primary PCI, so I broadened the search to include patients who had experienced an AMI. Because the search was limited to those papers published after 1999, the likelihood of patients in those studies receiving primary PCI as a treatment was greater because this is now the treatment of choice. The databases searched were CINAHL (EBSCO), Medline Cochrane Database of Systematic Reviews, pubMed, psycInfo, and the Social Citation Index. Keywords included *acute myocardial infarction*, *primary angioplasty*, *primary PCI*, *patient perceptions, patient understanding*, and *informational needs*. Further to the search of the databases, I performed an ancestry search using the same criteria. I identified 21 papers that met the initial inclusion criteria; however, after a preliminary reading of the papers, I excluded 11 for a number of reasons. These papers gave no indication of treatment received for the AMI, focused on post-discharge interventions, had participants who had received elective PCI versus primary PCI, or focused on perceived information needs as opposed to perception of the event. Of the papers that were included, three rated 2.0 relevancy, one rated 1.5 relevancy, and six rated 1.0 relevancy based on the scale described by Whittemore and Knafl (2005). A table indicating the included and excluded papers appears in Appendix A. The Whittemore and Knafl (2005) rating system reflects relevancy to the problem identified in this review with 2.0 indicating a high degree of relevance and 1.0 indicating a low degree of relevance. With regard to relevance, studies that included the primary PCI population were rated at 2.0. One study by Broadbent et al. (2006) was rated a 2.0 as the research question was extremely relevant to this review. Studies that scored less than 2.0 did not specifically include the population of patients who had received primary PCI as a treatment however; the research question was applicable to this patient population. The study that rated 1.5 was considered relevant to the review but was not assigned a 2.0 rating, as it was unclear if the participants received primary PCI as a treatment. Studies that rated 1.0 contributed did not specifically included patients who had received primary PCI, however, the research questions contributed to the overall themes included in the review.

Studies That Rated 2.0

Although there has been significant nursing research on the patient experience of AMI, there has been little research into the patient perception of their experience after receiving primary PCI for the treatment of an AMI (Sampson, O’Cathain, & Goodacre, 2008). The literature search yielded only three papers comprising original research on patient perception post primary PCI. All three were considered relevant enough to be scored 2.0. The lack of original research into this topic may be attributed to the short duration of which primary PCI has been used as a treatment for AMI.

The first study published by Astin, Closs, McLenachan, Hunter, and Priestly (2008b) was entitled “Primary Angioplasty for Heart Attack: A Mismatch Between Expectations and Reality.” The authors of this study are nurses. The aim of this study was “to explore patients’ experiences of primary PCI and assess their illness perceptions during early recovery” (Astin et al., 2008b, p, 74). The study setting was a tertiary cardiac centre in the United Kingdom. Twenty-nine participants were enrolled using purposeful sampling, which ensured that there was a balance between male and female and young and old. The inclusion criteria included patients who had undergone primary PCI for AMI, who did not have a previous history of cardiac disease, and who spoke English.

This study used a mixed qualitative and quantitative methodology by administering in-depth interviews and an illness representation questionnaire. The questionnaire was based on Leventhal et al.’s (1980, as cited in Astin et al., 2008b) cognitive model of illness and included eight subscales of patient beliefs. Specifically, these subsets include symptoms, acute versus chronic timelines, cyclical timelines, consequences, personal control, treatment control, emotional representation and illness coherence. The quantitative aspect of the study demonstrated that participants tended to view their illness as acute rather than chronic. In addition, the mean scores for illness coherence were high, indicating that there was a patient lack of understanding of their illness (Astin et al., 2008b). This lack of understanding is affected by a person's level of health literacy. The concept of health literacy will be explored further in later sections.

The qualitative data from the in-depth interviews were used to determine three main themes. These were the speed of events, expectations and reality, and emotional reactions. Many of the participants were amazed at the speed of events. In my experience, the whole team from the ambulance service to the emergency staff and the catheterization laboratory team all work together like a well-oiled machine, often managing the patient and procedure without even having to speak to one another. An unexpected outcome of this rapid and efficient functioning is that it contributes to patients feeling uncertain about what has occurred (Astin et al., 2008b).

The second theme involved a mismatch of expectations and reality, encompassing many aspects such as participants thinking they had received a general anesthetic as opposed to the local anesthetic they actually received. Along the same line, participants felt they had an operation, not a procedure. Unexpected low levels of procedural pain also contributed to the participants' uncertainty about what had happened. Many participants also had unexpected energy after their procedure, contributing to the notion that they may not have had a heart attack at all. This perception has implications for recovery. One participant in the study felt so well after the procedure that he walked 6 miles on the day of his discharge (Astin et al., 2008b).

The third theme of emotional reactions included disconnectedness, shock and disbelief, as well as denial (Astin et al., 2008b). Patients who have had AMI treated by other methods (Thompson, Ersser, & Webster, 1995) also experience these kinds of emotional responses.

However, the context of patient care differs in these cases, with patients receiving primary PCI for AMI being discharged from hospital an average of 2 days earlier (Astin et al., 2008b). There is less time for nurses to intervene.

The authors of the research note that mixed methodology of this study may have contributed to some of the limitations of the research in that participants were interviewed prior to completing the illness perception questionnaire potentially influencing the answers (Astin et al., 2008b). Additionally the exclusion of non-english speaking participants may have contributed to a bias in the results. This study also had the potential to favor those participants who are more at ease discussing their experiences versus completing a questionnaire. Participants with lower levels of health literacy may also be challenged to read and write opposed to speaking in an interview.

The second study that scored 2.0 relevancy was entitled “Feeling Fixed and Its Contribution to Patient Satisfaction With Primary Angioplasty: A Qualitative Study” (Sampson et al., 2008). The authors of the research are nurses. The aim of the study was to “explore positive and negative views of patient and carer experiences of undergoing primary angioplasty (Sampson et al., p. 85). This study used qualitative methodology in the form of semi-structured interviews. It included 21 participants who had been admitted to hospital with a diagnosis of STEMI and who underwent primary PCI as a treatment. Purposeful sampling was again used in order to obtain a sample that represented a range of ages, both sexes, varied times of admission, and a range of referral routes. This sample is representative of those types of patients who might be admitted to the hospital where I practice in the primary PCI setting. The setting for this research two major teaching hospitals in England.

Of interest to note, in this study, the researchers had to probe very hard during the interviews in order to elicit any negative experiences whatsoever. Participants, who comprised of both patients and their carers, had an extremely high degree of satisfaction with their hospital experience (Sampson et al., 2008). Many of the themes identified in the previous study that obtained a 2.0 relevancy were echoed in this research. The speed of events was a theme that was again noted:

> Both patients and their carers spoke of the speed of the patient's recovery and were amazed at the degree of improvement within a few hours of having their heart attack. Patients described how ill they felt prior to having the angioplasty, describing a lot of pain, feeling dreadfully ill, really sickly and knowing something was wrong with them. (Sampson et al., 2008, p. 4)

After the event, patients spoke of feeling as if nothing had happened to them, as if they were their old selves. Feelings of denial were also noted in this study in that many of the participants did not feel as if they had experienced a heart attack. It was noted in this study that if patients do not believe they have experienced a heart attack, they might not believe that they have a condition to control, and think instead, they have been "cured." This thought process potentially has major implications on patients' willingness to participate in cardiac rehabilitation and secondary prevention measures (Sampson et al., 2008).

The authors of this study concluded that a number of factors present during the patient experience of primary PCI for STEMI contributed to the high levels of patient satisfaction. These factors include the shorter length of stay and coronary care units that are well staffed with highly functioning nurses who delivered a level of care beyond expectation (Sampson et al., 2008).

The authors note there were two limitations of this research. These include the inability to contact patients directly as patients were approached by other nurses when invited to participate (Sampson et al., 2008). This method has the potential for missing some of the more negative experiences if nurses do not feel comfortable approaching these patients. Additionally, participants were interviewed one month after discharge. These people are potentially in a state of gratitude for receiving their lifesaving procedure (Sampson et al.) and will report increase positive feelings.

The third study in this category is Broadbent et al.'s (2006) "Patients with Acute Myocardial Infarction Have an Inaccurate Understanding of Their Risk of a Future Cardiac Event." This study arises from the discipline of medicine and was carried out in the coronary care unit of an Auckland, New Zealand hospital. While this research does not exclusively look at the perceptions of participants who have undergone primary PCI, most of the participants underwent PCI during the hospital admission. The aim of this study was to determine if patients left the hospital after an AMI with an accurate perception of the event and future risk of myocardial infarction. The risk of future AMI was calculated using the Thrombolysis in Myocardial Infarction (TIMI) risk score, an established tool. One hundred consecutive patients were invited to participate in the study, 96 participants were enrolled. Study participants completed a questionnaire on the morning of discharge and this was compared to the calculated TIMI risk score. This authors of this study concluded that there was no association between the patients' perception of risk and their actual stratified level of risk. Illness perception was assessed and found to be variable, similar to the findings by Cherrington et al. (2004), a study discussed in a further section.

This research does not explain how the participants formulate their risk of future events. Participants in this study had received a 30-minute visit with a cardiac rehabilitation nurse in the days prior to discharge who provided them with pamphlets outlining risk reduction strategies.

This intervention is similar to usual practice at the Royal Columbian Hospital. Participants are being 'taught', however, lack of accurate risk perception indicates they may not have 'learned'.

> While the three articles that scored 2.0 relevancy consist of both qualitative and quantitative methodologies similar themes around the patient experience of primary PCI are beginning to emerge. Many patients feel positive about the events surrounding their primary PCI, an unintended consequence of well functioning and efficient health care teams. Variability in patient perception is noted in all three papers. Shock, disbelief and disconnectedness of emotional reactions that have been reported.

Studies That Rated 1.5

The article that rated 1.5 relevancy was by Alsén, Brink, and Persson (2008) and entitled "Patients' Illness Perceptions Four Months After a Myocardial Infarction." This study comes from the discipline of nursing. The aim of the research was to explore patients' illness perception of their myocardial infarction. The study took place in Sweden. The researchers used grounded theory methodology. It included 25 participants who had experienced an AMI, and the bulk had received PCI as treatment. There is no mention in the article of how many patients had received primary PCI; however, all patients who received PCI as treatment received it while still in hospital for their AMI. Once again, many of the themes from the previous article on patients who had received primary PCI recurred. Even though the interviews took place 4 months post discharge, the finding provided good evidence of what patients' perception of the event was at hospital discharge.

In terms of the illness perceptions of myocardial infarction, the authors concluded that there were six main categories. The first category identified was that the participants felt their myocardial infarction was the sign of a chronic condition over which they themselves had influence. The individuals in this category were seen to be extremely self-reflective. These participants were engaged and interested in the causes, treatments, and lifestyle modifications required. The second category of illness perceptions identified that individuals saw their myocardial infarction as the sign of a chronic illness over which they had no control. These individuals were filled with uncertainty about why the event occurred and their confidence in their ability to change to influence recovery was low. Individuals in the third category felt that their myocardial infarction was an acute event that could possibly recur. This group felt that they would be able to influence whether or not another heart attack did occur by improving their lifestyle. The fourth category was made up of individuals who also felt that their myocardial infarction was an acute event that could recur; however, they felt they had no control over whether or not this happened again. The participants in the fifth category were seen to be less self-reflective in that they felt they had experienced an unthinkable event. Individuals in this category had predetermined and steadfast beliefs that their myocardial infarction would lead to physical and social incapacity. The final category was individuals who viewed their heart attack as an isolated occurrence and expected few consequences from it. Many of these participants used avoidance and denial when asked about their myocardial infarction. Alsen et al. (2008) noted,

> There is a distinction between viewing myocardial infarction as a delimited acute event. The perception of patients who were reflective in personal terms was that the heart attack was a sign of a chronic condition: they also devoted time to reasoning about the possible causes of their illness. This is in contrast to patients who were less reflective and viewed their myocardial infarction as an acute event which they avoided thinking about (p. 31).
>
> The study presented above continues with the theme of variability in patient perception. Additionally, the concept of viewing the event as acute versus chronic is emerging.

Studies That Rated 1.0

The final six articles included all rated 1.0 relevancy due to a lack of focus on patients who had undergone primary PCI. The purpose of much of this research was illness representation after AMI. As noted previously, these papers were included because the research took place after the year 2000, when the treatment of choice for AMI, especially STEMI, became primary PCI. Of these six papers, four used qualitative methodologies, one was quantitative, and one was an integrated literature review.

The research by Johansson, Swahn, and Stromberg (2007) was aimed at describing AMI patients' perceptions of their symptoms of AMI. This study was carried out by nurses in Sweden. Using a phenomenological methodology, in-depth interviews with 15 patients who had experienced an AMI were analyzed. Of the 15 participants, 11 had experienced a STEMI. There is no mention of the treatment that these patients received for their AMI. Analysis of the interviews yielded three main categories in describing the phenomenon of experiencing the symptoms of AMI. These categories were described as manageability, vulnerability, and interaction. Within the category of manageability, three subcategories were identified, including symptom awareness, which described participants differing experiences in attempting to understand what was happening, confidence in self-care, and denial of the severity of the symptoms. Denial is a theme that presents throughout much of the literature reviewed for this project. The authors of this paper concluded that there is a large variability in how patients perceived the experience of the symptoms of their AMI. This variability combined with short hospital stays makes patient education around secondary prevention measures challenging.

This research was conducted on a relatively small sample of Swedish speaking participants during the first 72 hours of the hospital stay. As noted previously the short duration of time between event and hospital discharge may affect patient perception. Patients may still be in a state of shock (Johansson, Swahn & Stromberg, 2006). Another limitation of this study is that it included only Swedish speaking participants.

The second article using qualitative methodology was Wiles and Kinmonth’s (2001) “Patients’ Understandings of Heart Attack: Implications for Prevention of Recurrence.” The purpose of this study was “to develop and pilot an integrated primary and secondary prevention program for patients with established heart disease” (Wiles & Kinmonth, 2001, p. 162). In this study, the authors come from the combined disciplines of medicine and nursing. The research took place in Britain. Study participants were purposely sampled to ensure variety in demographics. Because the aim of this study was to design and evaluate a program, all the participants received the pilot intervention, which included a visit with a cardiac intervention nurse and an invitation to participate in a secondary prevention program as well as clinical follow-up with nurses and a general practitioner. Along with these interventions, in-depth interviews were carried out with 25 of the participants from the integrated primary and secondary prevention pilot program. The interviews occurred 1 month and 4 months post AMI. Once analyzed, a number of themes similar to the previously described papers became evident. Participants reported feelings of shock and disbelief immediately post AMI. Additionally, there was the perception that the AMI was an acute event, from which complete recovery was possible. Because of this perception, many of the participants felt that they must have experienced only a mild heart attack, because complete recovery would not be possible after a severe heart attack. This perception continued for many participants even at the 4-month interview stage, where recovery from the event equated with cure of the disease. Researchers concluded that the participants understandings of their cardiac event were strongly influenced by the interventions provided within the pilot program.

The limitations of this study are significant. The original aim of the study was to explore patients’ understanding of heart attack after they had participated in the pilot program; however, no control group was included to provide comparison. All participants in the study received the pilot secondary prevention program intervention. No information was provided that indicated how the findings were implemented into the pilot program. Follow up research will be required in order to determine the effectiveness of the fully developed program.

The third study in this group using qualitative research methods was a paper by French, Maissi, and Marteau (2005), which investigated the beliefs of participants 1 week after experiencing an AMI. More specifically, these researchers looked at what people felt was the cause of their AMI. The discipline that this research arises from is psychology. Again, the study took place in Britain at a tertiary cardiac centre. Participants were first time myocardial infarction patient. A total of 22 patients were interviewed, however only 12 interviews were included in the analysis due to technical problems with recording equipment. Additionally, one interview was excluded because the participant did not believe that they had experienced a heart attack. Five themes emerged from the semi-structured interviews, which were organized using five components of Leventhal et al’s (1997, as cited in French et al., 2004) common sense model of illness representation (CSMIR) was the basis for the interpretation of the data. The researchers analyzed the transcripts using an “interpretive phenomenological analysis” (p. 1411). Of the five themes identified in the analysis, two were pertinent to the question of patients’ perception of their disease post AMI. Many participants in this study expressed an understanding of a single cause for their AMI as opposed to a chronic disease. These causes included smoking, obesity, or stress. Individuals in this study also tended to identify one of the above causes as the trigger for their AMI, again without understanding the role of their CVD in the cause of their heart attack. Participants were eager to blame the cause of their AMI on a multitude of external factors and attempted to rationalize this by citing the unpredictability of who may or may not experience an AMI.

The limitations identified by the authors of this study are the small sample of people who were interviewed immediately after their AMI potentially decreasing the generalizability of the findings (French et al., 2004). While there are “no rules for sample sizes in qualitative inquiry: (Patton, 2002, p. 244) I wonder if the authors make this claim due to only 54 percent of the participants interviewed being included in the data. The semi-structured interviews also provided for both the participant and interviewer the ability to direct the questions somewhat. The interviews also took place early in the patient experience of their myocardial infarction potentially with participants still in a state of shock (Johansson, Swahn & Stromberg, 2006).

The fourth study that rated 1.0 relevancy was a substudy of the work by Astin et al. (2008) in the United Kingdom. This research looked at the information needs of patients treated with primary PCI for heart attack. This study did not look to describe patient perception of the cardiac event, and that was the reason for it being graded less relevant than the parent research. The aim of this qualitative study was to explore the health information needs of primary PCI patients in the first 1 to 2 weeks of recovery. This exploratory study was based on self-reporting. It can be argued that the basis for information needs is patient perception; these concepts are linked and therefore self-reported information needs provide a glimpse into patient perception. The sample was comprised of the same 29 purposely sampled participants from the parent study. Patients undergoing primary PCI for STEMI are hospitalized for relatively short periods, limiting the opportunities for nurses to provide information to the patient and family. The information provided, combined with the patient level of health literacy and personal experience, allows patients to formulate an understanding of their CVD. Some of the information given to the patient prior to discharge may have the effect of increasing a person's understanding of CVD. For example, at the hospital where I practice, patients are often given a before and after picture of their coronary artery. The pictures offer a graphic illustration of what is happening within the patient's own body. Participants in this study found these images to be extremely powerful, because the pictures are individualized, more meaningful (Astin et al., 2008a).

The limitations of this study remain the same as the parent study. The fact that participants were interviewed prior to filling out the questionnaire may have influenced the answers. Non English speaking participants were excluded.

The fifth study in this group was research by Cherrington, Moser, Lennie, and Kennedy (2004). The authors of this research are nurses. This work looked at illness representation after AMI using quantitative methodology. The purpose of this study was to determine the existence of a relationship between illness representation at the time of an AMI and in-hospital complications; however, data did emerge regarding patient understanding of their condition. All 49 of the participants in this study had experienced a STEMI treated with PCI, although it is not noted whether the PCI was primary or urgent. According to Cherrington et al., when people are faced with a health threat, they form a personal representation of their illness. There are a number of variables, both internal and external, that contribute to the formation of an illness representation. These include demographic factors, social factors, personality, and health history. Although not noted in the article, I argue that level of health literacy would also be a factor in the development of an illness representation. I present the concept of health literacy later in this paper. All the participants completed the Illness Perception Questionnaire, an instrument designed to test cognitive representations of illness using Leventhal's (1997, as cited in Cherrington et al.) theory of self-regulation. This instrument consists of five scales that correlate with the concepts of illness representation, including identity, cure/controllability, consequences, cause, and timelines. The calculated scores from the instrument quantified each participant’s illness representation as positive or negative. Negative scores indicated larger numbers of symptoms, a strong belief in the cause of the AMI, an increase in perceived consequences and an inability to control or cure the illness. Positive scores correlated with participants who would go on to make positive lifestyle changes. In this study, an equal number of patients demonstrated positive and negative scores, indicating the variability in patient understanding.

While this research study was methodologically sound, the lack of qualitative data limits the ability to determine patient perception of the actual cardiac event. However, the data on positive of negative illness representation does give some insight into the question of patient perception of their myocardial infarction.

The final paper included in the review of the literature is itself an integrative literature review published in 2000. Gentz (2000) looked at the perceived learning needs of patients undergoing coronary angioplasty. Although other papers focusing on perceived learning needs were excluded from this review, this one received a 1.0 relevancy rating because there were a number of concepts identified by the authors that addressed patient perceptions of their coronary event. This literature review looked specifically at papers published between 1989 and 1999 and enrolled participants who had undergone PTCA (PCI). Around the patient experience of PCI, Gentz notes that “less time is allowed for nursing interventions that provide education to the patient and family; however, teaching patients in preparation for discharge from the hospital is the health professional’s responsibility” (2000, p.162).This integrative literature review looked at 19 papers. Sample sizes of the 19 studies ranged from 14 to 251 participants. The bulk of the studies were quantitative at 74 percent. The angioplasty experience emerged as one of three major themes. Gentz concluded that patients undergoing angioplasty were overall pleased with their experience. Many felt it was non-threatening and routine. However, there were some negative feelings of dehumanization or lack of control over decision making. The degree of threat patients felt from their heart disease was mild to moderate.

The final six papers included in the integrative review scored only 1.0 relevancy due to the focus on AMI versus primary PCI, however, many of the themes of variability, emotional responses and positive experience continue. An analysis of all three categories of article follows.

Analysis of the Studies

Interestingly, only one of the papers included in this review was from North America. This was the literature review by Gentz (2000). The majority of the studies reviewed by Gentz were published in American medical or nursing journals. The other nine studies included in this review of the literature were carried out in Britain, Ireland, Sweden and New Zealand. As noted previously research on patient perceptions of their experience of primary PCI for STEMI is scant. Clearly, future research is required from the North American perspective. Recently, I attended an international STEMI conference in Chicago. While I was there, I was surprised to hear of the significant differences between the STEMI systems of care between Canada and the United States. In many of the United States, helicopters are routinely used to transport patients from outlaying hospitals to the regional STEMI centre. This type of rapid transport surely contributes to patients misinterpreting their event. Research is required from both Canadian and US perspectives.

While the number of studies included in this review was relatively small, some key findings around patient perception of the experience of primary PCI in the setting of STEMI are evident. These findings are evident both the quantitative studies (Astin et al., 2008a; Broadbent et al., 2006; Cherrington et al., 2004) and those that used qualitative methods (Astin et al., 2008b; Sampson et al., 2008; Johansson et al., 2006; Wiles & Kinmonth, 2001 and French et al., 2004). A theme that weaves throughout the studies used in this review is the variability of patients' perception of their PCI experience and how they view their CVD afterwards (Johansson et al).

While many patients experience shock and disbelief after primary PCI for STEMI (Astin et al., 2008a; Wiles & Kinmonth, 2001) there are also many that perceive the experience as being positive (Sampson et al., 2008). This may be the result of emotional disconnect as described by Astin et al (2008a). Additionally, the speed and efficiency of the treatment for STEMI can also lead to patients perceiving the event as positive (Astin et al.). Sampson et al. also noted that patients perceive that the care they received was highly efficient and specialized. Astin et al. (2008a) demonstrated that there was a mismatch between patient expectations and events. As is evident here, the patient perception of primary PCI for STEMI is extremely variable.

Also evident in the literature is the patient perception that they have an acute versus a chronic condition (Cherrington et al., 2004; Astin et al., 2008a; Wiles & Kinmonth, 2008; French et al., 2004). This perception is one that is especially challenging for health care providers who are attempting to assist patients to recognize the need for cardiac rehabilitation and risk reduction strategies. Patients on one study (Alsen et al., 2008) who did perceive their condition as chronic were seen to be more self reflective and eager to engage in risk reduction strategies.

Finally, a significant limitation to many of the studies that performed interviews or questionnaires at hospital discharge noted that patients at this stage of their experience of primary PCI for STEMI may still be in stages of shock, disbelief, disconnectedness, denial (Astin et al., 2008a; Wiles & Kinmonth, 2001) or alternatively, gratitude (Alsen et al., 2008;

Astin et al 2008a; Broadbent et al., 2006). This brings into question the accurateness of assessing patient perception at this time point in their experience. Further research is required to pinpoint the most appropriate time to assess patient perception.

Discussion

In this discussion section, the major themes surrounding the question of what patient perception is at discharged from hospital after primary PCI for STEMI are explored. A limited amount of research has been done on the subject of patient perception of their primary PCI experience (Astin et al, 2008a; Cherrington, 2004; Johansson et al., 2006; Sampson et al, 2008). This is demonstrated by the small number of recent papers included in this review of the literature. The subject of patient perception of AMI does provide a glimpse into what conclusions we may expect to observe from the limited research done. Prior to 2000, much of the literature demonstrated that patients experiencing an AMI understand little of what has happened to them (Gulanick et al., 1997; Zerwic, King, & Wlasowicz, 1997). This trend has been exacerbated by the advent of primary PCI for STEMI and the resultant rapid discharge from hospital.

The very nature of the primary PCI experience does not lend itself to assisting patients understand what has happened to them. From the very moment that a person enters the health care system complaining of the symptoms of a STEMI, she or he is treated with and by some of the most efficient systems and health professionals that can be found within a Canadian health care environment that is constantly stretched for resources. Paramedics specially trained to interpret the electrocardiogram a chest pain patient receives, rapidly transport the STEMI patient to the appropriate hospital with advanced warning so the emergency room personnel are ready and waiting. The cardiac catheterization staff in the Fraser Health Region performs primary PCI on approximately 600 patients a year and thus is an efficient team able to focus on making the experience as comfortable as possible for the patient. The staffing levels in the coronary care unit are high; patients may feel well cared for and safe. All this speed and efficiency contributes to the patients' understanding of the event (Astin et al., 2008). Research has shown that patients begin to develop an understanding of their condition early in their hospital experience as they begin for formulate an illness perception (Broadbent et al., 2006). Such rapid and efficient treatment surely contributes to potential misperception of CVD and its role in STEMI (Sampson et al., 2008). The significant technology involved in the initial treatment of STEMI includes advanced x-ray equipment in a procedure room that looks much like an operating room. These factors also contribute to the notion that there has been an acute event (Astin et al., 2008) rather than an event caused by a chronic disease.

Perceiving the STEMI as an acute condition that can be cured is another theme that is repeated throughout the literature. As discussed previously, CVD is a condition that can be managed; it is never cured and yet the perception that it can be cured is prevalent. Although there are patients who understand that their AMI is a sign of a chronic condition, these patients tend to be more reflective and have higher levels of health literacy than those who do not. Patients exhibiting these attributes and understanding will leave hospital with an increased awareness of their disease and will be motivated to make the lifestyle changes necessary to aid in managing their CVD (Alsen et al., 2008). Patients who leave hospital with a view that their acute event has been cured will be less motivated to make these changes (Wiles & Kinmonth, 2001). Further complicating the acute versus chronic debate is whether the AMI is perceived by the patient as mild or severe. People who experience a severe or more serious heart attack are more likely to understand the underlying chronic health issue than those who have experienced a milder heart attack (Alsen et al.).

Patient misinterpretations of the events surrounding their STEMI as well as the symptoms that they are experiencing also affect levels of understanding. As an example, many participants in the research described how quickly they went from feeling dreadfully ill to feeling well again (Astin et al. 2008b; Sampson et al., 2008). Patients may find it difficult to understand that what they have experienced is indeed a heart attack when they may be feeling better than they have in a very long time. Other misinterpretations include the actual PCI procedure; patients discuss lack of procedural pain and absence of scarring as not making any sense when they have had what in their mind equates to an operation (Astin et al.). Patients may also misunderstand the information that they receive from the health professionals while in the hospital due to previously held beliefs about heart attack (Wiles & Kinmonth, 2001). In my experience, I have heard nurses say to patients, “We fixed the artery.” Additionally, health professional say things such as “fixing the culprit narrowing” or “you have some rust in the pipes.” These types of statements can lead a patient to misunderstand the chronic nature of CVD. Misinterpretation of the events surrounding the STEMI and a misunderstanding of CVD has the potential to have significant consequences for the patients. As noted previously, patients who do not have an understanding of their CVD may not be as motivated to participate in secondary prevention measures once they leave hospital. Conversely, patients may engage in unhelpful behaviors because physically they feel so well (Astin et al.). Misinterpretation may also cause fear in some patients (Astin et al.; Alsen et al., 2008; Broadbent et al., 2006). This fear has the potential to prevent patients from participating in any rehabilitation (Astin et al.).

Another concept that requires inclusion into the discussion of why patients may not participate in post discharge cardiac rehabilitation and risk reduction strategies is that of health literacy. In order for people to participate fully in the recommended health promotion activities, adequate personal levels of health literacy must be present. Additionally, patient educational materials need to be prepared so that patients with lower levels of health literacy are able to understand. A discussion of the concept of health literacy follows.

Health Literacy

Whether or not a patient leaves hospital after experiencing a STEMI treated by primary PCI with an understanding of their disease is affected by more than just the speed of events, short duration of hospital stay, or other factors noted previously; it is also affected by a person's level of health literacy. The concept of health literacy is strongly connected to a person's level of literacy in general and includes such aspects as reading comprehension, writing ability, verbal communication comprehension, and numeracy skills. There are a number of definitions of health literacy found in the literature such as "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (Black, 2008, p. 55). This definition was not chosen for the purposes of this paper, because it does not address the context of health for individuals or the changing level of health literacy over one's lifetime. It has been shown that a person's level of health literacy declines after age 65 due to many of the factors associated with aging (Rootman & Gordon-El-Bihbety, 2008).

Heath literacy, for the purposes of this paper, can be understood as "the ability to access, understand, evaluate, and communicate information as a way to promote, maintain, and improve health in a variety of settings across the life course" (Rootman & Gordon-El-Bihbety, 2008, p.

13). This definition incorporates the elements of literacy, health promotion, and life continuum in a way that reinforces the fact that a level of health literacy is crucial to managing one's health. It has been shown that the consequences of low levels of health literacy are many and may include increased medication and treatment errors, less ability to follow treatment plans, less ability to navigate the health care system, and an increased risk of rehospitalization (Black, 2008). Also important to this discussion of health literacy is the concept of empowerment. If our goal in the educative role as nurses is to enable the patients to participate in the secondary prevention strategies that will help them managed their CVD then they need to be empowered to do so. According to Rootman and Ronson (2005) "The related concept of empowerment is considered to be the key mechanism of health promotion. Literacy can be one means of gaining control over ones health if it is internally imposed" (p. 65). Additionally, important to the concept of health literacy are the societal factors influencing health literacy including, an aging population, increasing use of sophisticated computers and technology (Rootman & Ronson, 2005).

In the Fraser Health Region, when patients are discharged from hospital after experiencing a STEMI treated with primary PCI, they are given a discharge prescription with many medications, smoking cessation information if needed, and a referral to a local cardiac rehabilitation program. These discharge prescriptions include a tremendous amount of information. For example, there are a minimum of five different medications that patients must take including beta-blockers to protect the heart from further damage, ACE inhibitors to keep blood pressure low, Aspirin and Plavix to keep the coronary arteries and stents open, and statins to decrease blood cholesterol. These five medications are usually just the beginning with many patients also being diabetic and requiring pills or insulin to regulate blood sugar levels among a host of other co-morbid conditions that may require additional medications. Smoking cessation may require the use of nicotine patches or gum along with other medications to decrease cravings. Cardiac rehabilitation programs occur at a number of locations throughout the region and require the ability to navigate roads or transit systems. Multiple lifestyle changes are also important once people are discharged from hospital after experiencing a STEMI. Along with smoking cessation, these include measures to control weight, increase activity, eat healthy, and decrease stress. There is a tremendous amount of information for people to access, understand, and evaluate. This requires a high level of health literacy.

Is the level of health literacy an issue when patients are rapidly discharged from hospital with a large amount of information after primary PCI for a STEMI? One of the main goals in discharge teaching is to get patients involved in secondary prevention measures in order to decrease the risk of further progression of their CVD and decrease future admissions to hospital. There is the risk of patients who have lower health literacy levels not accessing or participating in secondary prevention measures. Low levels of health literacy have been shown to decrease health outcomes. In Canada it is estimated that 55% of people between the ages of 16 and 65 years have levels of health literacy below adequate. After the age of 65 only 12% of people have adequate health literacy levels (Rootman & Gordon-El-Bihbety, 2008). These numbers are cause for some concern. It is widely accepted that as people age they are at more risk for chronic health problems; combined with low health literacy skills, poorer health outcomes will result (Rootman & Gordon-El-Bihbety). Since the beginning of the primary PCI program in the Fraser Health Region, a total of 1,323 patients have received this treatment for STEMI. Of the patients who received primary PCI for the treatment of STEMI, 54% were over the age of 65 (G. Simkus, personal communication, July 16, 2009), putting them at an increased risk for worse health outcomes. It is interesting that those people who have lower levels of health literacy also view their own health as only fair or poor. They are 2.5 times more likely to feel this way than those with higher levels of health literacy (Rootman & Gordon-El-Bihbety). Not only are people over the age of 65 at risk for low levels of health literacy, but additionally, people who have immigrated to Canada, especially if they are female, and those with disabilities are at a greater risk for inadequate levels of health literacy. These low levels of self-reported health status are good predictors of poorer health outcomes (Benjamins, Hummer, Eberstein, & Nam., 2004). The importance of health literacy to people with CVD is significant and adds another dimension to the recommendations that follow.

Recommendations

Although the literature on the patient perception of the experience of STEMI and primary PCI is lacking, the inclusion of patients who have experienced an AMI has offered some data that points to the issue that many patients do not leave hospital with an understanding of their disease. The recommendations in this section have been formulated on this basis. The concept of health literacy has been included in these recommendations because it has been shown that low levels of health literacy in patients with CVD leads to worse health outcomes (Black, 2008).

The first recommendation is to develop and test tools that help determine the level of patient understanding of their event. Such a tool may take the form of semi-structured interviews, illness perception questionnaires, other types of questionnaires, or scripted interviews. Throughout the literature, all of these tools were used to assess patient perceptions and there is some debate as to which tool is most adequate (Smith & Liles, 2006). Within the literature review, the most widely used tool to assess perception in research was the Illness Perception Questionnaire. This tool is available for free on the Internet at http://uib.no/ipq/. The tool uses the five components of Leventhal's (1980, as cited in Astin et al., 2008) self-regulating model of illness and assesses: identity, cause, timelines, consequences, and cure/control. An issue with using such a tool in the clinical setting is the expertise required to interpret the findings as it is a research tool. Yet such a tool could be adapted for use in clinical settings in cases where illness perception needs to be assessed. According to Astin et al. (2008), patients prefer a verbal face-to-face interaction with the health care professional and thus an interview format may be most appropriate format for carrying out such an assessment. Further, patients with low levels of health literacy may find filling out a written questionnaire difficult and the results invalid. Studies that used semi-structured interviews yielded rich data that provided a deeper understanding of patient perception. The development of a scripted semi-structured interview to assess patient understanding and assist in determining patient educational needs is the recommendation. Scripted semi-structured interviews can be tailored to individual patient health literacy levels and can accommodate patient individuality, knowledge levels, clinical situations, and social and demographic factors (Buckley, McKinley, Gallagher, Dracup, Moser, & Aitken, 2007). Such interviews also allow the nurse to understand individual patient perception. This is important because it has been shown that there is often a difference between what practitioners think patients understand and the reality (Scott & Thompson, 2003; Smith & Liles, 2006). Misunderstandings between practitioners and patients can result in ineffective educational material being provided. The timing of such an interview is also of importance. Because patients who have experienced a STEMI and received primary PCI are discharged rapidly from hospital, this is a significant challenge. Immediately after the primary PCI is not the time to assess understanding; patients at this time will have received sedation and analgesic medications and may still be feeling the surreal effects of being in the cardiac catheterization laboratory. Later in the hospital stay and shortly prior to discharge is the preferable time to determine patients' perceptions (Astin et al.).

Once a patient's perception of the disease is determined, then appropriate education materials and techniques can be provided. As with the interviews, patients prefer a verbal face-to-face approach (Astin et al., 2008; Buckley et al., 2007; Decker et al. 2007; Murie, Ross, Lough & Rich, 2006). Patient education is most effective if it is meaningful to the patient; thus, discharge teaching must be individualized and focused on patient, not health care provider, priorities. As previously noted there is often a difference in perception of educational needs between patients and their health care providers (Scott & Thompson, 2003; Smith & Liles, 2006). Additionally, there may be differing perceptions between patients and their spouses (Scott & Thompson). An advanced practice nurse educator with an expertise in educational theory would be of benefit here. Smith and Liles noted,

> The literature reveals a complex, ambiguous and frequently challenging role for nurses, who are regarded as the principal providers of patient education within CR [cardiac rehabilitation]. Whilst some authors strongly endorse models of health education which advocate collaboration with and empowerment of patients, many studies confirm the continuing influence of the medical models towards patient education, which are didactic and pedagogic in nature. (2006, p. 664)

The education needs of these patients are complex and the time frame for interaction while in hospital is short. Advanced practice nurse educators bring knowledge of student or patient-centred education techniques. As an example, at the Royal Columbian Hospital a program is being initiated where volunteers who have previously experienced an AMI will be visiting patients in the cardiac unit. This program builds on the principle of social constructivism in that the patients will be building new knowledge within the context of a social relationship. Patients do feel that there is benefit from hearing the stories of those who have been through the same experience (Lyons, Fanshawe, & Lip, 2002; Smith & Liles, 2006).

Individualized education has been shown to be beneficial; however, there are a number of priorities that are applicable to most patients (Astin et al., 2008a; Buckley et al., 2006; Decker et al., 2007; Murie et al., 2006; Scott & Thompson, 2003; Smith & Liles, 2006). These include information on risk factors, anatomy and physiology, medications, and physical activity (Scott & Thompson, 2003). As noted previously, patients prefer face-to-face interaction when receiving information; however, this is certainly not practical in all settings and patients do reference material once they have been discharged. Written materials should be written to accommodate those with low levels of health literacy, and include pictures and diagrams as well as text to highlight key points (Black, 2008; Decker et al., 2007). Upon discharge, patients should receive tailored treatment plans as well as the reference materials because patients who have received primary PCI for the treatment of STEMI may not routinely participate in post-discharge cardiac rehabilitation programs even if they have been refered (Higgins, Hayes, & McKenna, 2000).

The third recommendation is around the concept of health literacy. While it would be ideal for patients to have their level of health literacy assessed while in hospital in order to provide individual education. This would seem to be an unrealistic expectation due to the short time frame of hospitalization. I propose educating nurses on the concept so they may incorporate some of the techniques identified by Black (2008) into their discharge discussions with patients. These techniques include the use of plain language and visual aids. Further to educating the nurses on the concept of health literacy I recommend beginning the process of assessing all present patient education materials for adequacy in terms of both content and appropriate health literacy levels.

Conclusion

As previously noted, CVD is a substantial worldwide health issue affecting people at the global, regional, and local levels. Although there has been significant changes in the treatment of CVD, including primary PCI for the treatment of STEMI, there are a number of challenges that continue. In this paper, I have identified that many people who have experienced a STEMI treated with primary PCI do not leave hospital with an understanding of their disease. It is interesting that many patients leave hospital with a misunderstanding of their disease. The many reasons for this became evident in this review of the literature. What also became evident is the lack of current research on this topic. Further research into this phenomenon is essential.

In order for people to effectively manage their CVD they must possess accurate perceptions of their disease. People who feel they have been cured will be less likely to engage in the measures necessary to decrease further risk such as taking medications, ceasing smoking, and other lifestyle modifications. The recommendations put forth in this paper will assist people in the Fraser Health Region to understand their CVD after experiencing a STEMI and lessen future impact from the disease.

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Appendix A

Table A1. *Excluded Articles*

Citation	Purpose	Method
tz, J., Hoglund, A., Arnetz, B., & Winbald, U. (2007). Development and evaluation of a questionnaire for measuring patient views of involvement in myocardial infarction care. *European Journal of Cardiovascular Nursing, 6*, 1–11.	To develop a questionnaire to help understand how patient/staff interaction may impact treatment outcomes for AMI.	Quantitative
Buckley, T., McKinley, S., Gallagher, R., Dracup, K., Moser, D. K., & Aitken, L. M. (2007). The effect of education and counseling on knowledge, attitudes and beliefs about responses to acute myocardial infarction symptoms. *European Journal of Cardiovascular Nursing, 6*(2), 105–111.	To test the effect of individually tailored education and counseling intervention on prehospital delay times.	Quantitative/Evaluation
Decker, C., Garavalia, L., Chen, C., Buchanan, D., Nugent, K., Shipman, A., et al. (2007). Acute myocardial infarction patients' information needs over the course of treatment and recovery. *Journal of Cardiovascular Nursing, 22*(6), 459–465.	To describe patient preferences for involvement (role) as well as the types of info patients desire to facilitate decision making along the myocardial infarction continuum.	Qualitative
Astin, F., & Jones, K. (2006). Changes in patients' illness representations before and after elective percutaneous transluminal coronary angioplasty. *Heart & Lung: The Journal of Acute and Critical Care, 35*(5), 293–300.	To examine changes in patients' self-reported illness representations before and after first-time percutaneous transluminal coronary angioplasty.	Quantitative
Yuval, R., Halon, D., & Lewis, B. (2007). Perceived disability and lifestyle modification following hospitalization for non-ST elevation versus ST elevation acute coronary syndromes: The patients' point of view. *European Journal of Cardiovascular Nursing, 6*, 287–292.	To examine alterations in patient lifestyle following hospitalization for acute coronary syndrome and to compare from the patients' viewpoints differences in outcome and function after hospitalization for unstable angina pectoris, nonSTEMI and STEMI.	Quantitative
Murie, J., Ross, A., Lough, M., & Rich, D. (2006). Exploring post-myocardial infarction patients' perceptions of patient-mediated interventions for the secondary prevention of coronary heart disease (SIGN guideline 41). *Quality in Primary Care, 14*(2), 77–83.	To explore postmyocardial infarction patients' perceptions of a patient-mediated intervention for secondary prevention of coronary heart disease.	Qualitative

Russell, S., & Kirby, M. (2006). Evaluation of post-MI patient diaries show concerns... post-myocardial infarction. *British Journal of Cardiology, 13*(2), 154.	To assess if diary helped increase patients' knowledge of their condition, improved self-management, and increased involvement in their care and treatment.	Qualitative
French, D., Maissi, E., & Marteau, T. M. (2005). The purpose of attributing cause: Beliefs about the causes of myocardial infarction. *Social Science & Medicine, 60*(7), 1411–1421.	To explore patient beliefs about the causes of myocardial infarction.	Qualitative
Attebring, M. F., Herlitz, J., & Ekman, I. (2005). Intrusion and confusion—the impact of medication and health professionals after acute myocardial infarction. *European Journal of Cardiovascular Nursing, 4*(2), 153–159.	To explore patients' experiences of secondary prevention after AMI.	Qualitative
Lau-Walker, M. (2004). Relationship between illness representation and self-efficacy. *Journal of Advanced Nursing, 48*(3), 216–225.	To explore relationship between illness perception and self-efficacy following a cardiac event and the implications for nursing practice.	Quantitative
Scott, J. T., & Thompson, D. R. (2003). Assessing the information needs of post-myocardial infarction patients: A systematic review. *Patient Education and Counseling, 50*, 167–177.	To examine information needs of postmyocardial infarction patients.	Systematic review
Smith, J., & Liles, C. (2007). Information needs before hospital discharge of myocardial infarction patients: A comparative, descriptive study. *Journal of Clinical Nursing, 16*(4), 662–671.	To explore the information needs of patients who have received treatment for myocardial infarction before their discharge home from an acute hospital.	Quantitative

Appendix B

Table A2. *Included Articles*

Citation	Purpose	Method
Astin, F., Closs, S. J., McLenachan, J., Hunter, S., & Priestley, C. (2008). The information needs of patients treated with primary angioplasty for heart attack: An exploratory study. *Patient Education & Counseling, 73*(2), 325–332.	To explore the information needs of patients treated with primary PCI for heart attack.	Qualitative
Astin, F., Closs, S. J., McLenachan, J., Hunter, S., & Priestley, C. (2008). Primary angioplasty for heart attack: Mismatch between expectations and reality? *Journal of Advanced Nursing, 65*(1), 72–83.	To explore patients’ experiences of primary PCI and assess illness perception.	Mixed
Sampson, F., O’Cathain, A., & Goodacre, S. (2008). Feeling fixed and its contribution to patient satisfaction with primary angioplasty: A qualitative study. *European Journal of Cardiovascular Nursing , 8*(2), 85–90.	To explore positive and negative views of patient and carer experiences of undergoing primary PCI.	Qualitative
Wiles, R., & Kinmonth, A. (2001). Patients’ understandings of heart attack: Implications for prevention of recurrence. *Patient Education and Counseling, 44*(2), 161–169.	To explore patients’ understanding of heart attack in order to contribute to the design of secondary prevention measures.	Qualitative
Gentz, C. (2000). Perceived learning needs of the patient undergoing coronary angioplasty: An integrated review of the literature. *Heart & Lung: The Journal of Acute and Critical Care, 29*(3), 161–172.	To present a comprehensive account of the perceived concerns and learning needs of patients in the early recovery period after a coronary angioplasty.	Integrated literature review
Alsén, P., Brink, E., & Persson, L. (2008). Patients’ illness perception four months after a myocardial infarction. *Journal of Nursing & Healthcare of Chronic Illnesses, 17*(5), 25–33.	Explore patients’ illness perceptions of myocardial infarction 4 months after myocardial infarction.	Qualitative
Cherrington, C., Moser, D., Lennie, T., & Kennedy, C. (2004). Illness representation after acute myocardial infarction: Impact on in-hospital recovery. *American Journal of Critical Care, 13*(2), 136–145.	To determine the relationship between illness representation of myocardial infarction and the occurrence of in-hospital complications.	Quantitative
Broadbent, E., Petrie, K. J., Ellis, C. J., Anderson, J., Gamble, G., Anderson, D., et al. (2006). Patients with acute myocardial infarction have an inaccurate understanding of their risk if a future cardiac event. *Internal Medicine Journal, 36*, 643–647.	To investigate whether risk perceptions of patients with myocardial infarction were accurate compared with an established risk model	Quantitative

Johansson, I., Swahn, E., & Stromberg, A. (2007). Manageability, vulnerability, and interaction: A qualitative analysis of acute myocardial infarction patients' conception of the event. *European Journal of Cardiovascular Nursing, 6*, 184–191.	To describe variations in how individuals perceive suffering symptoms of an acute myocardial infarction.	Qualitative

Appendix C

Citation: Authors:____
Title: ____
Journal: ____
Year:________ Volume:________ Issue:__________ Pages:___________

Type of study: Qualitative Quantitative Mixed
Location:____

Key Concept:____
Variables: Interventional/Independent Variable: ___________________________
Dependant Variable:___________________________________
Controlled Variable:___________________________________

Framework/Theory:____
____

Design Type: Experimental Nonexperimental Quasi-experimental
Specific Design:____
Blinding: None Single Double
Description of Intervention:_____________________________________
____
Comparison Group:____
Cross Sectional Longitudinal/Prospective No o Data Points:______________
Qualitative Tradition: Grounded Theory Phenomenology Ethnography Other
Sample: Size:____________ Method: ________________________________
Characteristics: ____
Data Sources: Self Report Observational Biophysiologic Interview Other
Description of Measures:____
Quality:____
Statistical Tests: Bivariate T-Test ANOVA Chi-Square Pearson's R Multi Var
Multiple Regression: MANOVA Logistic Regression Other

Findings:____
____
Effect Sizes: ____
Themes: ____
____
Recommendations: ____
____
Strengths:____
____
Weaknessess/Limitations:____
____
Adapted from Polit & Beck, 2008, p. 120.