Impact of Knowledge about Early Ambulation on Patients' Satisfaction Post Percutaneous Coronary Intervention, at Assiut University Hospital

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Abstract

Percutaneous coronary intervention is a common procedure requiring expert nursing care delivered within an interdisciplinary team. One of the most common treatments for CAD is percutaneous coronary intervention.

Aim: This study was carried out to investigate the impact of knowledge about early ambulation post percutaneous coronary intervention on patients' satisfaction.

Design: A quasi-experimental design.

Setting: In catheterization and coronary care units.

Subjects: A convenience sample of all adult educable and mentally competent male and female patients aged from (18-60 years old) who had undergone a non-emergency percutaneous coronary intervention (PCI) through femoral artery during a period from July 2010 to June 2011 were eligible for inclusion in the sample.

Tools: Four tools were utilized to collect data pertinent to the study.

Tool I: Assessment of patients after femoral sheath removal and angioplasty related data.

Tool II: Pre/post knowledge assessmentsheet.

Tool III: Pre/post observation check list sheet.

Tool IV: Satisfaction assessment sheet.

Methods: Pretest knowledge sheet filled out by the patient and observation checklist sheet was checked by the researcher for both groups, the teaching protocol has been implemented for patient in terms of session, each session ranged from 6-10 patients for theoretical and practical contents, immediately post knowledge sheet testfilled out by the patient and observation checklist sheet was checked by the researcher for both groups.

Results: Finding of the present study revealed that significant improvement of all parameters with values of less than p=0.001 in response to give information among the two groups.

Conclusion: Educating patients before percutaneous coronary intervention can effectively improve level of knowledge and satisfaction.

Key Words: Early ambulation – Patients' satisfaction – Percutaneous coronary intervention – Patient knowledge.

Introduction

PERCUTANEOUS coronary intervention (PCI) is a revascularisation strategy for coronary heart disease (CHD). These procedures are performed in emergent, planned or rescue situations [1]. Over recent decades, technological advances, adjuvant therapies and new indications for stenting have increased the uptake of PCI. Percutaneous coronary intervention is a common procedure requiring expert nursing care delivered within an interdisciplinary team [2]. One of the most common treatments for CAD is percutaneous coronary intervention (PCI). PCI is recommended to treat unstable or chronic stable angina and ST-segment elevation myocardial infarction (STEMI) when only 1 or 2 arteries are involved [3]. PCI has been demonstrated to improve prognosis, relieve symptoms, reduce ischemic events, and improve functional capacity in a relatively low-risk procedure with a rapid recovery [4].

Provision of education may equip patients undergoing coronary angioplasty with the knowledge and skills to ameliorate the previously highlighted problems. Aiming to provide sufficient information
to enable patients to cope with all aspects and implications of the disease and assume ultimate responsibility for their health care [5]. Education can equip patients with the skills to recognize and alleviate fear and anxiety, to identify and deal with stress-provoking situations and to express the emotional meaning the illness has for them. On its own, education has been shown to significantly decrease cardiac mortality, improve psychological status, improve knowledge and decrease risk factor behaviours in patients after coronary angioplasty [6].

Patient satisfaction is considered a marker of effectiveness of health care delivery and is often used as a benchmark of health system performance. Patient satisfaction has been shown to be influenced by physician communication skills, age, patient expectations and length of relationship with the physician. There is increasing interest in the potential influence of a patient's clinical condition on their satisfaction with care [7].

Nurses play an important role in promotion of the patient’s knowledge before an invasive procedure [8]. Due to the lack of knowledge, patients experience anxiety, stress, and consequently hemodynamic instability in response to an invasive procedures. Further more, due to prolonged bed rest in a fixed position after the procedure, the patients report feelings of discomfort and intolerance [9]. Patient’s knowledge may decrease their psychological problems [10], significantly decrease the nursing work load, reduce the hospital stay, and also promote the patients and nurses’ satisfaction, comfort and tolerance related to an invasive procedure. Many studies have shown that the patients benefit from information about an invasive diagnostic procedure [11]. There are many methods of patients’ education like verbal information, written information, leaflets, booklets, audiotapes, and video information [12]. But an ideal method to be used for patients’ education is still unknown. In spite of these methods, the verbal information by nurses and physicians is the common routine for patient’s education before percutaneous coronary intervention in many hospitals [13].

**Research design:**
Quasi experimental research design has been utilized in this study.

**Setting:**
This study was carried out in catheterization and coronary care units.

**Sample:**
A convenience sample of all adult educable and mentally competent male and female patients aged from (18-60 years old) who underwent for non-emergency 6 frenshe percutaneous coronary intervention (PCI) through femoral artery were recruited from July 2010 to June 2011. All patients meeting the criteria were approached during the recruitment period. They were assigned into study and control groups.

**Inclusion criteria:** Were are considered: All patients had a six French sheath, normal prothrombin time. (10-14 seconds) (Urdenetal 2010), normal renal function test. (BUN is 5 to 25mg/dl, creatinine is 0.5 to 1.5mg/dl) (Urdenetal 2010), hemodynamically stable.

**Exclusion criteriawere:** Considered, coagulation abnormalities, hypertension, chronic lower back pain, transradial coronary angioplasty, groin pathology, previous surgery in the iliac or femoral arteries, complications developed during coronary angioplasty and coronary angiography.

**Matching criteria:** Were considered, mean age range of (1-3 years), sex, the same level of education (read and write), the same size of sheath (6F), the same dose of heparin.

**Content validity:** The tools were tested for content related validity by jury of 5 specialists in the field of critical care nursing and coronary medicine from Assiut University and Cairo University, and the necessary modifications were done.

**Pilotstudy:** Apilot study was conducted on 8 patients after explain the nature and purpose of the study to test the feasibility and applicability of the tools. The necessary modifications are required. These necessary modifications were done and the pilot study patients were excluded from the actual study. The Reliability was done on study tools by cronback’s Alpha (0.95).

**Protection of human rights:** An official approval was obtained from hospital administrative authority to collect the necessary data after explanation of the aim and nature of the study. Patients’ anonymity and confidentiality were ascertained, patients’ was
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maintained and voluntary participation and right to refuse to participate in the study were emphasized to the patients. Written consent was obtained from patients who are willing to the study.

Study tools: Three tools were used to collect the data in this study.

Tool I: Patient assessment sheet after femoral sheath removal and angioplasty related data:

This tool consists of two parts and developed by the researcher after review of literature [5,8,11-13]:

Part I: Socio-demographic and angioplasty data which includes: Age, sex, past medical history, hospital stay and time of homeostasis to assess patient's profile.

Part II: Assessments after femoral sheath removal, which includes pulse, mean arterial blood pressure and peripheral pulse assessment to assess vital signs and catheterized leg.

Tool II: Pre/post knowledge assessment sheet:

This tool was used to assess and measure the exact patient knowledge about heart function, coronary artery diseases, activity, nutrition, and medication. The same tool was used immediately after the implementation of knowledge about early ambulation (immediately post test). It consists of 30 items covering the previous parts.

Scoring system:

A total score was 60 degree. The 60 degree was distributed through its five parts: Knowledge about the heart was 10; knowledge about the cardiac catheterization was 20, knowledge about healthy heart diet was 10, knowledge about physical activity was 10, knowledge about coronary disease was 10. Each right answer was given two degree for all questions with total scores 60. Those who scored less than 60% considered as having an unsatisfactory, but more than 60% considered as satisfactory.

Tool IV: Satisfaction assessment sheet:

This part consists of 12 items short form of the patient satisfaction questionnaire (PSQ). Modified by Salah et al., [15]. The patients had to respond to the questions about both positive negative aspects of the procedure on a 3-point scale: “Yes a lot”, “yes a little”, and “no”. These will respectively scored 3, 2 and 1. The higher scores indicate greater satisfaction with the procedure (60% or more), and the lower scores (less than 60%) indicate dissatisfaction with the procedure and includes procedure related items, patient feeling items, communication.

- Procedure explanation.
- Nurse/patient communications.
- Comfort.
- Procedure time.
- No fear from procedure.
- No fear from instruments.
- Procedure cost.
- Doctor checked after procedure.
- Lack of anxiety.
- Confidence with procedure.
- Lack of stress.
- Recommending procedure to others.

Procedure:

Preparatory phase:

- The patient admitted early in the morning at the cardiac catheterization unit. The researcher obtained demographic and clinical data from the patient's medical record as well as directly from the patient such as the patients' age, sex, and medical diagnosis.
- Heart rate and mean arterial pressure were measured using bedside monitor connect to the wall by three cardiac electrodes.
- Peripheral pulse was measured by palpitation in the popliteal and dorsal pedis arteries.

Implementation phase:

For theoretical content:

The teaching protocol has been implemented for patients in terms of sessions, with a total of 35 sessions. Number of patients in each session ranged from 6-10 patients. Then the researcher teaching patient using verbal information and then provided each patient w designed illustrated booklet. The duration of each session was an two hours, including 10 minutes for discussion and feedback. Each
session usually started by a summary of what has been taught during this session and the objectives of the topics. Feedback and reinforcement of teaching was performed according to the patients needs to ensure their understanding.

For practical content:
- The researcher conducting demonstration using teaching materials (photos). This was done on a small sessions ranged from 6-10 patients. The duration of each session was an two hours ,including 10 minutes for discussion and feedback.
- Most patients were able to ambulate and can master this skill easily. Then the immediately post practical test was filled out by the researcher.
- Theoretical and practical content were repeated according to the ability of understanding.

Statistical design:
Data was collected and analyzed by computer programmed SPSS (ver. 16). Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations for qualitative variables. Qualitative variables were compared using chi-square test to determine significance for non parametric variables-test used to determine significance for numerical variables. The critical value of the tests “$p$” was considered statistically significant when $p$ less than 0.05.

Results
Table (1) shows that 60% of the study and control groups were in the age group of 50-60 years old, concerning to medical diagnosis, 95% and 85% had previous angina. There was no significant statistical difference between the two groups in relation to age, and medical diagnosis. ($p=0.992$ and $p=0.321$ respectively).

Table (2) shows, the mean bed rest hours for study and control groups were 4.20±0.89 and 11.15±1.87 hours with high significant statistical difference between them $p=0.001$. As regards to the mean time of compression to achieve hemeostasis for study and control groups, it was 18.25±2.712 and 16.75±3.041 minutes with no significant statistical difference between both groups. Concerning to hospital stay, all patients stayed as the same period of time in study and control groups.

Table (3) showssignificant improvement of all parameters with values of less than $p=0.001$ in response to give information among the two groups.

Table (4) show that there is allow base line (pre-test) mean scores of practice parameter. However, the postimplementing showed a significant improvement with values of ($p=0.001$) among two groups.

Table (5) show that, significant statistical differences between the two studied groups in relation to PCI and CA ($p=0.034$, $p=0.045$ respectively).

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Table (1): Comparison between the study and control groups in relation to socio demographic.

<table>
<thead>
<tr>
<th>Socio demographic data</th>
<th>Percutaneous coronary intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Study N=40</td>
</tr>
<tr>
<td>Age group:</td>
<td></td>
</tr>
<tr>
<td>&lt;40 years</td>
<td>4</td>
</tr>
<tr>
<td>41-50 years</td>
<td>12</td>
</tr>
<tr>
<td>51-60 years</td>
<td>24</td>
</tr>
<tr>
<td>Mean±SD (year)</td>
<td>50.15±7.611</td>
</tr>
<tr>
<td>Sex:</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>30</td>
</tr>
<tr>
<td>Female</td>
<td>10</td>
</tr>
<tr>
<td>Medical diagnosis:</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>22</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>18</td>
</tr>
<tr>
<td>Previous angina</td>
<td>38</td>
</tr>
<tr>
<td>Previous MI</td>
<td>8</td>
</tr>
</tbody>
</table>

Ns: No significant statistical difference.
Chi-square tes.
Independent samples $t$-test.
* Significant at ($p≤0.05$).
MI: Myocardial infarction.

Table (2): Comparison between the study and control groups in relation to bed rest, time of compression and hospital stay (Mean±SD).

<table>
<thead>
<tr>
<th>Bed rest, time of compression and hospital stay</th>
<th>PCI (therapeutic cardiac catheterization)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study N=40</td>
<td>Control N=40</td>
</tr>
<tr>
<td>Mean±SD</td>
<td>Mean±SD</td>
</tr>
<tr>
<td>Duration of bed rest after PCI/CA (hours)</td>
<td>4.20±0.89</td>
</tr>
<tr>
<td>Time of compression to achieve hemeostasis (minutes)</td>
<td>18.25±2.712</td>
</tr>
<tr>
<td>Hospital stay (%) (Less than one day)</td>
<td>0</td>
</tr>
<tr>
<td>(More than one day)</td>
<td>100</td>
</tr>
</tbody>
</table>

Chi-square test. * Significant at ($p≤0.05$).
Table (3): Pre and post information knowledge scores among study group (Mean±SD).

<table>
<thead>
<tr>
<th>Knowledge items</th>
<th>PCI (therapeutic cardiac catheterization)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre test</td>
</tr>
<tr>
<td>Heart and its medication</td>
<td>N=40 Mean±SD</td>
</tr>
<tr>
<td>Maximum score=10</td>
<td>4.5±2.41</td>
</tr>
<tr>
<td>Information before CC</td>
<td>N=40 Mean±SD</td>
</tr>
<tr>
<td>Maximum score=10</td>
<td>2.55±1.91</td>
</tr>
<tr>
<td>Information after CC</td>
<td>N=40 Mean±SD</td>
</tr>
<tr>
<td>Maximum score=10</td>
<td>0.9±1.6</td>
</tr>
<tr>
<td>Nutrition</td>
<td>N=40 Mean±SD</td>
</tr>
<tr>
<td>Maximum score=10</td>
<td>1.6±0.87</td>
</tr>
<tr>
<td>Activity</td>
<td>N=40 Mean±SD</td>
</tr>
<tr>
<td>Maximum score=10</td>
<td>0.7±1.24</td>
</tr>
<tr>
<td>Disease</td>
<td>N=40 Mean±SD</td>
</tr>
<tr>
<td>Maximum score=10</td>
<td>4.1±2.3</td>
</tr>
<tr>
<td>Total scores</td>
<td>N=40 Mean±SD</td>
</tr>
<tr>
<td>Maximum score=60</td>
<td>12.25±7.64</td>
</tr>
</tbody>
</table>

Independent t-test * significant at (p<0.05).

Table (4): Pre and post practice scores among study group (Mean±SD).

<table>
<thead>
<tr>
<th>Observation check list</th>
<th>PCI (therapeutic cardiac catheterization)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre test</td>
</tr>
<tr>
<td></td>
<td>N=40 Mean±SD</td>
</tr>
<tr>
<td>Steps of ambulation</td>
<td>N=40 Mean±SD</td>
</tr>
<tr>
<td>Maximum score=10</td>
<td>6.05±1.18</td>
</tr>
</tbody>
</table>

Independent samples t-test * Significant at (p<0.05).

Table (5): Comparison between the study and control groups in relation to satisfaction percentage score.

<table>
<thead>
<tr>
<th>Satisfaction score</th>
<th>PCI (therapeutic cardiac catheterization)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Study N=40</td>
</tr>
<tr>
<td></td>
<td>No. %</td>
</tr>
<tr>
<td>Procedure relation:</td>
<td></td>
</tr>
<tr>
<td>Procedure explanation</td>
<td>39 97.5</td>
</tr>
<tr>
<td>Procedure time</td>
<td>35 87.5</td>
</tr>
<tr>
<td>Procedure cost</td>
<td>33 82.5</td>
</tr>
<tr>
<td>Confidence with procedure</td>
<td>33 82.5</td>
</tr>
<tr>
<td>Patient feeling:</td>
<td></td>
</tr>
<tr>
<td>Lack of anxiety</td>
<td>19 47.5</td>
</tr>
<tr>
<td>Comfort</td>
<td>38 95</td>
</tr>
<tr>
<td>No fear from procedure</td>
<td>35 87.5</td>
</tr>
<tr>
<td>No fear from instruments</td>
<td>15 37.5</td>
</tr>
<tr>
<td>Lack of stress</td>
<td>33 82.5</td>
</tr>
<tr>
<td>Communications:</td>
<td></td>
</tr>
<tr>
<td>Nurse/patient communications</td>
<td>33 82.5</td>
</tr>
<tr>
<td>Doctor checked after procedure</td>
<td>40 100</td>
</tr>
<tr>
<td>Recommending procedure to others</td>
<td>35 87.5</td>
</tr>
<tr>
<td>Score (Mean±SD)</td>
<td>71 ±9.89</td>
</tr>
</tbody>
</table>

NA not applicable. Chi-square test. * Significant at (p<0.05). Independent test.

Discussion

The aim of this study was to investigate the impact of knowledge about early ambulation among post cardiac catheterization on patients’ satisfaction. The present study presented that the majority of both groups were in age group 50 to 60 years old and most patient were males. This can be attributed to the higher exposure to life stress, and female hormones protect female from CAD. This in line with Andrea [16], who studied early sheath removal and ambulation in patients submitted to PCI: A randomized clinical trial, found that 64% of the study sample was males, and their mean age were 59.7% years old. This is may be related to changes of the heart and blood vessels that occur with aging such as the decrease in elasticity and the ability to respond to changes in compliance of the arterial system that increase the work needed to drive the blood to the various organs of the body due to resultant increase in the resistance to the pumping action of the heart [17].

The current study revealed that the majority of the studied patients were married. This is in line with Basuny [18], study about the effect of position changing post coronary angiography on patient’s outcomes, which revealed that the majority of the studied sample was married. This may attributed to the high level of daily life stress on married patients than single one and that stress is considered one of the most aggravating factors for CAD. Both moderate and intense physical and mental activities were associated with ischemic episodes. Some studies estimated that in the hour after high levels of negative emotions, the risk for ischemia double and this is because the effects of mental stress are that stenosed coronary artery segments responded to mental stress by constricting, whereas normal segment typically responded by dilating [19].

The presented study show that less than half of the control and study groups had hypertension and diabetes mellitus. Abdel-El Ghany [20], agree with current study reported that 36.7% of the study had hypertension and 49% had diabetes mellitus.

Management of hemeostasis at the access site after cardiac catheterization is important to reduce complications, increase patient comfort and safety, and decrease hospital stay. Management of the arterial access site after diagnostic and/or intervention catheterization continues to evolve. The current study found that 100% of study and control groups using manual compression. Ford [21], agree with current study who mentioned that manual compression is the “gold standard” after femoral
artrial sheath removal. This may attributed other vascular closure devices contribute to increase health care cost, and it remains unclear whether closure devices reduce vascular complication rates. Also, Boztosun et al., [22] documented that manual compression hemoestasis followed by bed rest has been the standard of care following cardiac catheterization via femoral access.

Prolonged bed rest is one of the conservative measures to avoid local bleeding but is associated with discomfort [23] The current study show that the mean bed rest hours for control and study groups were 8.1 ± 1.8 and 4.8±0.89. Chair et al., [24] reported that the duration of the bed rest varies from 2 to 24 hours and there is no recommendation on the optimal duration of such a bed rest. McCabe et al., [25] documented that prolonged bed rest in supine position is based on the previous nursing experience rather than on research.

Similarly, Chen et al., [26] evidenced prolonged bed rest duration after percutaneous coronary intervention and showed that reduced bed rest duration is safe and feasible without increasing puncture site complications. Most importantly, it can increase patient comfort and well-being.

Many studies focus on reducing bed rest duration during the post-coronary procedures in an attempt to promote patient’s comfort. Among the studies reviewed, some studies such as those conducted by Vlasic et al., [27] as actually involved alternative interventions such as elevation of the head-of-bed and changing the patient’s position during bed rest. The effect of changing position has been further examined by Chair et al., [28] in a randomised controlled study with fairly large sample size of 419 Chinese patients undergoing cardiac catheterisation.

The current study findings revealed that the study group was more satisfied about early ambulation than control groups. In this respect.

Patient satisfaction can drive patients to facilities where the most progressive care is provided, such as femoral access catheterization. Assisting the patients’ understanding of the benefits of femoral access catheterizations will reduce anxiety and provide a more positive experience. Information about patient satisfaction is valuable, especially when there is a question about the alternate access site, but nurses and technologists also need to understand the complications associated with transradial catheterization so they can anticipate and try to prevent them.

In addition, many studies have shown that patient satisfaction results were often skewed to the positive responses, especially with older patients, and the instruments used may not be sensitive enough to detect differences between groups of patients Chair et al., [28] Therefore, the results of this study should be interpreted cautiously.

McDonnell, [29] found conflicting evidence concerning providing preprocedural information, which is in line with the lack of consistent evidence for using decisional aids culminating in conflicting recommendations. Bernstein et al., [30] studied 217 patients referred for PCI procedures in a randomized controlled trial. The patients received either an audio-visual presentation outlining treatment options or usual care (control). The results demonstrated an increase in knowledge for the treatment arm yet a decrease in satisfaction. In contrast, Astley et al., [31] conducted a randomized control trial using various decisional aids, with verbal patient education sessions considered “usual care”. These investigators found no difference in recall, patient satisfaction or anxiety levels. Regardless of these findings, the legal requirements for obtaining informed consent remain an important consideration.

Clark et al., [32] emphasise the need for healthcare providers to seek regular feedback regarding the quality of pre-discharge education. Given the diverse patient characteristics in relation to health literacy, English comprehension and level of education, appropriate forms of information sharing are required to improve access to and retention of the information shared. Evidence of long-term effectiveness of secondary prevention strategies is still emerging. In a 10-year follow-up study of an RCT of nurse led secondary prevention programs in primary care settings, Delaney et al., [33] concluded that the closer to diagnosis secondary prevention strategies are employed the greater the chance patients have for medium to long-term survival. Nurses play an important role in advocating for secondary prevention strategies with patients and family.

Early ambulation was not shown to have an effect on improving patients’ satisfaction level, which was not consistent with the previous study Basuny [18], Cultural influences should be taken into consideration when assessing the satisfaction level of patients because culture influences how feelings are expressed and what verbal and non-verbal expressions are appropriate Vlasic et al., [27]. Feelings about the care they received would disturb the harmony.
Nurses on the front line caring for patients before, during and after cardiac catheterization play a key role in the prevention of complications. With the increasing number of cardiac catheterizations performed, evolving technology, and advances in pharmaceutical therapy comes an increase risk of vascular complications [33].

Finally, teaching patient can effectively improve patient knowledge and satisfaction.

**Conclusion and Recommendations:**

Based on the findings of the present study, it can be concluded educating patient before diagnostic and therapeutic cardiac catheterization via femoral artery access can effectively improve level of knowledge and satisfaction.

**In the light of the above, the following recommendations are suggested:**

- Equip the cardiac catheterization unit with simple illustrated guidelines protocol covering the major early ambulation practices post femoral cardiac catheterization
- Develop an in service audiovisual materials training about early ambulation, complications and its management after cardiac catheterization for patients.
- Establishing a standardized protocol for early ambulation after diagnostic and therapeutic cardiac catheterization.
- Apply clinical practice guidelines for optimal patient care after femoral cardiac catheterization.
- Early ambulation should be added to the routine care.
- Using other methods of education before cardiac catheterization
- Educate patients who are undergoing to cardiac catheterization the day before procedure.

**References**


