Most Frequent and Severe Symptoms and Learning Needs among CABG Patients

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Introduction

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality in developed countries, contributing to disabilities, poor quality of life, and early death. Over 80% of CVD deaths take place in low and middle-income countries, and the most common form is coronary artery disease (CAD).

Coronary artery disease accounts for over 7.9% of total healthcare expenditure in all industrialized countries and is a global concern (WHO, 2007). The common surgical treatment method for CAD, and a life saving intervention since the 1960s is Coronary Artery Bypass Graft surgery (CABG) (Gao, et al., 2009; Wijns, et al., 2010). Globally, on average one in every 500 individuals annually undergoes a CABG procedure (WHO, 2007). Surgery for CAD may be indicated for symptomatic or prognostic reasons. The decision to advise CABG is based on the balance between the expected benefit and the risks that the patient faces.

In Jordan, CAD is the primary leading cause of death accounting for 35.9% of CVD's deaths and 15% of total deaths in 2009 (Jordanian Ministry of Health, 2009). The first CABG surgery was performed at Queen Alia Heart Institute in 1973.

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Preliminary data has shown that CABG patients are going home with symptom management problems and that complications arising from these problems might be prevented with early detection and management (Zimmerman, et al., 2004).

Symptoms distress includes physical and psychological problems. On the other hand, learning needs assessment is recommended as a necessary step in patient education program development, to formulate a strong educational plan that will increase the likelihood of a successful recovery (Beagley, 2011).

The increased numbers of CABG surgeries led to recent economic pressure for both the hospital and the patients, which results in a significant reduction in the length of hospital stay (LOS), a decrease in additional health services and an increase in nurse-to-patient ratios in all areas of hospital services (Doering, et al., 2002). The short LOS of CABG patients (4 to 5 days) impacts the time available for patient teaching, with a lack of policies that ascertain the importance of educating and communicating with patients, leads to heightened anxiety levels among patients and their families (Gao, et al., 2009; Kelin-Fedyshin, et al., 2005). These creates a challenge for nurses, as well as for other healthcare professionals as less time and policies are available for providing education to the patient and their families (Pieper, et al., 2006). The nature of learning needs is not well known in the immediate period after discharge, during patients' recovery period at home (Jones, 2007), in which responsibilities shifted from healthcare providers to patients and their families (Kelin-Fedyshin, et al., 2005).

Furthermore, the recovery period after CABG is perceived as one of crisis and considerable stress, and associated with adverse psychological and physical functioning. The first few weeks of recovery can be particularly stressful with unexplained symptoms, uncertainty prognosis, or difficulties with the treatment regime (Keeping, 2010; Utriyaprasit, et al., 2010).

Purpose

This study aim to identify what are the most frequent and severe symptoms and most frequent learning needs among Jordanian CABG patients post-discharge within the first month.

Methodology

Cross-sectional, descriptive design was used, using Mishel theory of uncertainty in illness as aguidance, recruited a convenience sample from two settings, one large teaching hospital and one large military hospital in Amman (the capital), both hospitals had no structured educational programs. Sample size calculated by G power(version 3.1.5) was 156, from 230 questionnaire distributed 161 returned answered (response rate 70%).

Mishel theory of uncertainty used to guide inclusion criteria, which were (1) Jordanian patients who attend for follow up at out patients clinics(OPD) in the selected hospitals from the first visit (after one to two weeks) up to one month. Reasoning that the degree of uncertainty may differ with the duration of diagnosis, and because the longer the patients have lived with continual uncertainty, the more positively they evaluate it (Mishel, 1997), as uncertainty evolves over time, so it is better to measure it from the beginning. (2) Patients undergoing elective CABG surgery for the first time, with no additional surgical interventions as valve surgery, pace maker insertion, or re-opening and no previous serious post-surgery complications such as bleeding, cardiogenic or septic shock to ascertain novelty of situation because according to Mishel theory patients who had previous CABG surgery may have more symptoms and more post operative learning needs. (3)Subjects who were willing to take part in the study, able to hear and speak and comprehend Arabic or English language. (4) Patients' ages were over 21 years old and up to 75 years.

All patients who conduct off-pump CABG surgery were excluded (this type of surgery is correlated with less symptoms and complications, while on-pump surgeries mainly have more complications especially neurocognitive dysfunction). Also CABG patients who have cognitive dysfunction (mentally incompetent), such as confusion, delirium or anxiety disorders were also excluded (like patients with stroke and aortic dissection). In other words patients must be fully oriented to place, person, and time, as part of Mishel theory' requires cognitive appraisal, as judged by the researcher in the clinics while collecting data. Mishel et al., (1984) stated that if cognitive structure is not formed, then the patient loses the ability to appraise the situation and react appropriately.

Finally, CABG patients who have physical impairment that would limit their physical functioning after surgery, as documented in literature that long length of hospitalization or previous physical impairment will increase symptoms distress.

Ethical Considerations

A permission to conduct the study was obtained first from the ethical committee at Faculty of Nursing at The University of Jordan. Then the targeted hospitals' approval was obtained from their research review committee. A package was given to participants containing a cover letter that includes information about the study purpose, what is expected from participants, where to return the questionnaire (if they applied alone without researcher help), in addition to data collection plan, potential benefits and minimal risks of the study, confidentiality and anonymity of data.

Instruments/ Measures

Data was collected using Arabic versions of self-reported questionnaires, divided into three parts, after taking the permission from the original authors and Arabic translated authors, which were:

Cardiac Symptoms Survey (CSS)

The first part was the Arabic version of Cardiac Symptoms Survey (CSS) developed by Al-Dukak (2011), original instrument developed by Nieveen, et al. (2008). This scale consists of 10 post CABG symptoms (angina, SOB, fatigue, depression, trouble sleeping, incision pain, swelling in the leg, fluttering heart beat, anxiety, and poor appetite).

This scale originally assessed symptom perception, evaluation, and response for the 10 symptoms for the last seven days(the response to symptoms management was not included in this study as it is out of the researcher' concern here). Rate the symptom's frequency on a scale from"none" zero to "all the time"10. The severity ranked from "none" "zero" to "extremely severe" "10".The mean of the frequency and severity for each symptom was computed to provide a mean symptom evaluation score (mean of symptoms distress) for each symptom.

The scores for the means of frequency and severity are combined and divided by two, resulting in a mean of symptom distress (Niveen et al., 2008).This tool is reliable with Cronbach's alphas for frequency and severity scores ranging from 0.85 to 0.98 and test–retest correlations of 0.84–1.0 across all symptoms (Nieveen, et al., 2008). The content validity of the original CSS has been established through literature review and interviews and questionnaires with researchers and CABG patients, and confirmed by a panel of cardiovascular clinical nurse specialists (Schulz, et al., 2011a).in this study after conducting a pilot study upon 25 patients the Arabic version of CSS reliability was measured by Cronbach's alpha was 0.91, and it validated by two experts with experience in the nursing cardiovascular field and found content validation index (CVI=0.90).

Cardiac Patients Learning Needs (CPLNI)

The second part was the Arabic version of modified Cardiac Patients Learning Needs Inventory (CPLNI) developed by Alkubati, et al. (2012) , originally developed by Gerard and Peterson (1984) to assess patients perceptions of importance of learning needs, and modified based on literature from 1984-2009 to assess cardiac patients' perceptions of the information or needs considered important to learn. Permission from both the Arabic and English authors had been taken.

Al-Kubati et al (2012) made some modifications to the original learning needs of CABG patients by adding two subscales related to CABG patients complications (3 items); chest and leg wound care (3 items) (Alkubati, et al., 2012) (with the original authors' permission), and excluding some subscale and items as they were inappropriate for CABG patients, so Al-Kubati et al final tool consist of 44 items. In this study, introduction to CCU items (three items) were deleted as this study is dealing with CABG patients post-discharge, so final number of items for this tool in this study was 41 items.

The patients can rate how much it is important for them to know about a certain items on the basis of Likert scale from one point (not important) to five points (very important), (zero if not applicable), scores ranged from 41-205, with a high score indicating high needs of information.

The internal consistency reliability of the modified Arabic version was confirmed with Cronbach's alpha which was 0.95. Furthermore, the content validity was maintained by three doctoral nurses and two cardiovascular clinical nurse specialists. in this study after conducting pilot study, Cronbach' alpha was 0.96. Also this tool was validated by two experts in nursing cardiovascular field, CVI was found to be 0.90.

Demographic Factors

The third part was developed by the researcher to obtain the demographic and personal information. These data include; hospital type, age, gender, marital status, smoking, educational level, employment status, comorbidity/ chronic diseases (such as DM, HTN, COPD, and heart failure (HF)), receiving educational information at home and at hospital, presence of social support person, LOS in CICU, and LOS at floor.

Results

Sample Characteristics

Analysis was done by using SPSS version 21.0.from the 161 participants the majority of patients were from the military sector (86.3%). The second setting was a big teaching hospital (13.7%).Most of participants were males (57.1%). The age of participants ranged from 38 to 75 years old, with a mean age 55.1 (SD= 7.9). Majority were married (82.6 %), while widows represent 17.4 % of the sample. Moreover, 42.2% of the study participants were current smokers. Their educational levels varied among the study participants, nearly one third (33.5%) of the sample had an essential degree (from the first grade to tenth grade), 24.8% had completed high school, 21.1% had a diploma and above, while 20.5% were illiterate.

Almost half of the participants were employed (49.1%), half of these employed participants (50.3%) stated that they will return to work once cured. The majority of patients (90%) were diagnosed with chronic diseases (comorbidities). However, HTN and DM were found to be the most common types with 35.4%. The study describes the caregivers, according to the Jordanian culture of social support, the persons taking care of the patients were mainly family members.

Most of the participants (79.1%) answered they had social support persons, mainly their sons and daughters (33.5 %). Fifty three percent of the patients reported that they had received educational information at the hospital, and 79.5% of the participants had also received educational information at home. Length of stay after surgery in CICU ranged from one to seven days with a mean of 2.9 days $\pm$ 0.8, while staying on the ward floor ranged from two to 18 days with a mean of 5.4 $\pm$ 3.7 days. Patients' demographic characteristics were shown in table (1).

Most Frequent and Severe Symptoms among Jordanian CABG Patients

Using descriptive statistics (means and standard deviations), symptoms evaluation scores were calculated (as a mean of the frequency and severity rating for each symptom (range 0-10). The highest mean of symptoms evaluation scores were: chest incision pain/leg pain 3.26 ($\pm$ 1.85), anxiety 2.8 ($\pm$ 1.9), and sleeping troubles 2.2 ($\pm$ 3), while the least mean of symptoms were: fluttering feeling (rapid racing heartbeat) 0.70 ($\pm$ 1.7), depression0.71 ($\pm$ 2.1), and angina 0.82 ($\pm$ 1.59) (see table 2).

Most Frequent Learning Needs among Jordanian CABG Patients

Using descriptive statistics (means, standard deviations) the categories of learning needs ranked in order of importance. Relatively all subscales showed high means with an average for all (4.2$\pm$ 0.7) out of 5; wound care (4.83), complication information (4.73), psychological factors (4.36), medication (4.33), diet information (4.30), other miscellaneous information (4.24), anatomy and physiology (4.23), risk factors (4.17), and physical activity (3.97) (see Table 3).

Discussion

The top frequent and severe symptoms were; chest incision/leg pain, anxiety, and sleep disturbances. The reason for reporting incisional pain as the most common one is that CABG surgery involves many pain-sensitive structures, including sternotomy and leg incisions with cutting of subcutaneous muscle, bone, and visceral tissues (Parry et al., 2010). Surgical cardiac pain can be visceral or somatic, arising from tissue injury and inflammation, and neuropathic, resulting from direct injury to nerves (Koltzenburg , 2002). It can be caused from sternal incision, graft site, breast pain, or any procedure/recovery that includes pain.

Unfortunately healthcare providers sometimes do not concentrate on non-pharmacological means for pain relief like; relaxation techniques, music therapy, distraction and so on.

Incision pain is one of the most prevalent symptoms identified by CABG patients post-discharge such as Burke, (2003); Gallagher et al., (2004); Lie et al., (2012); Parry et al., (2010); Schulz et al., (2011); Whitman, (2004); and Zimmerman et al., (2010). The same results were found in Al-Dukak (2011) in which the most common complaints in Jordanian CABG patients two weeks after discharge were incisional pain, leg swelling, anorexia and sleep disturbance. Incisional pain was also the second highest score of symptoms after fatigue inNieveen et al (2008) study among CABG patients two weeks after the surgery, followed by sleep disturbances which are also consistent with this study. On the other hand, a few studies found that pain was rarely reported, such as Watt-Wattson et al. (2008) who found that 20% of CABG patients have continued to report moderate to severe pain at three weeks after discharge.

For anxiety, It can be explained due to struggling with return to work and role expectations. The employed participants may felt anxious due to fear of losing their jobs especially for men, and how this surgery may affect their resumption of work; in addition men could be concerned about being dependent on their spouses, and how to occupy their time during recovery. For women (who mainly did not have a spouse and were unemployed) they could be afraid of who would take care of them. Also, anxiety might be caused by sleeping disturbances or fear of complications or unknown, Johansson et al (2010) found an association between anxiety and sleeping disturbances. Young age may be a precipitating factor in which younger patients (like participants in this study) were more anxious than older one (Gallagher and McKinley, 2009).

Some studies found that both the psychological symptoms of anxiety and depression were frequently reported (Doering, et al., 2002; Koivla et al., 2010; Lee, 2009; Malik et al., 2005;Utriyaprasit et al, 2010) while others showed lower frequencies in both such as Gallgher and McKinley (2009); Krannich, et al., (2007). In this study anxiety was found to be high whereas depression was found to be low.

Regarding sleep disturbances as one of the most reported symptoms, it could be related to drugs' side effects (ACE Inhibitors and statin medications), or due to incisional pain and anxiety which were highly reported, especially in first month when lying on their back, this combination can contribute to sleeplessness (Gallagher et al., 2004, Hartford, 2005, Parry et al., 2010; Schulz et al., 2011; Whitman, 2004). Furthermore, patients with a leave from jobs may stay home in the first month post-discharge, spending more of the day sleeping thus decreasing their ability to sleep at night causing insomnia (Parry et al., 2008).

When compared with previous literature; Zimmerman et al., (2011) found that approximately 50% of patients experience sleep disturbance during the first few weeks after CABG . Also, Burke (2003) reported that insomnia during the first week was the major complain. Similarly, Redeker (2008) and Schulz et al. (2011b) reported sleep disturbances up to three months after cardiac surgery as one of the most frequent and severe symptom. Contradictory to these results, some researchers had reported that sleep disruptions following CABG surgery do not decrease significantly (Moore, 1994; Redecker, 1993; Zimmerman et al., 2002).

The least common symptoms in this study were; fluttering, depression, and angina. Fluttering (tachy arrhythmias) was found to have the lowest scores. The reason for this may because most patients post-CABG surgery started on beta-blockers and sometimes Amiodaron medication which reduces tachyarrhythmia especially Atrial Fibrillation (AF) (Schulz, et al., 2011b).

Similar results were reported in Nieveen et al (2008) study and Al -Dukak (2011) study who both found fluttering to be the lowest scored symptom. In addition, McCormick (2001) found that the least frequent symptoms were anorexia and irregular heart rate. While in contrast to these results, more than one third of CABG patients post-discharge reported AF as the most common complication after surgery(Hogue et al., 2005; Merkouris et al., 2009).

The depression mean score was found to be low, it seems that the presence of social support from family members as well as healthcare providers had an impact on psychological status of these patients. Also, Jordanian culture imposed the importance of supporting sick family members, Islamic patients sought help through reciting the Holy Quran, believing that life-stressors are determined by fate, and suffering aids in building character.

Depression being one of the least reported symptoms is consistent with the results of Barnasonet al., (2000), Krannich et al., (2007) and Zimmerman et al. (2004). In contrast, Rymaszewska (2003) found the depression score ranged from mild to moderate after cardiac surgery. Also, Gallagher et al., (2004) found that physical problems such as sleep disturbances, incisional pain and anorexia six weeks after discharge significantly correlated with depression. Lopez et al. (2007) found a close association between patients' physiological and psychological functioning, with high levels of depression at one and three months post-surgery.

Finally, angina was the least reported common symptom, maybe because the goal of CABG surgery is to relieve angina pain. Some studies only measured angina before surgery and did not measure it after because it is supposed to disappear after surgery (Nieveen et al., 2008; Schulz et al, 2011b). The low figures could also be due to the prescribed anti-angina drugs as Nitroglycerine, Aspirin, or Statin, which is given to reduce incidences of Myocardial Infarction, angina, and ischemic stroke for one year after CABG (Schulz, et al., 2011b).

This result is consistent with Zimmerman et al., (2004) in which angina remained the lowest at two, four, and six weeks post-discharge among CABG patients. Also, incidence of persistent chest pain after surgery was rarely reported in Lahtinen et al., (2006) study. On the other hand, Tranmer and Parry (2004) reported that 66% of patients continued to have pain six weeks after CABG surgery, but authors explained that by suspecting there was confusion among patients between angina pain and incisional pain.

Most Frequent Learning Needs among CABG Patients

The most frequent learning needs in this study were wound care, complication information, and psychological factors, while the least reported learning needs were physical activity, risk factors and anatomy and physiology. Wound care was reported as the most frequent learning need and this may be due to that most patients had DM, and most diabetic patients had problems in wound care and high susceptibility of infections, and believe that wound do not heal quickly, also due to the shortened LOS which is associated with increased patient responsibility for incision care after discharge. These results were consistent with the highly ranked symptoms in which patients ranked incisional pain and anxiety as the most distressing symptoms so therefore, it is understandable that the most important learning needs would be wound care and psychological factors.

Alkubati et al., (2012) study found similar results, in which the most frequent learning needs were the chest and leg wound care, while the least frequent was physical activity. Also, it was consistent with Beggs et al.(1998) who found that complications, chest and leg incision care and whom to call, were the most ranked learning needs while the least one was the physical activity. In addition, it was consistent with the Al-Qissi study (2003) who found that wound care, followed by complications and symptoms information, ending with risk factors most reported learning needs among Jordanian CABG patients. While the least were physical activity, return to work, surgery related concern, and medication information.

Gao et al., (2009) study and Wu and Xu study (1995) reported that the most important learning needs were; physiologic needs, informational needs, and psychological needs, managing and understanding wound care. Therefore, wound care is the most important care needed for discharged patients. Thus, hospitals should provide more education about wound management for patients and their caregivers after CABG surgery.

On the other hand, these results were inconsistent with studies conducted among patients before discharge or while waiting the surgery, as Fredericks et al (2009b) study who found that physical activity was the most frequent learning need followed by complications and incision pain among CABG patients before discharge. AlsoLindsay et al., (1997)study who found that patients waiting for CABG surgery reported that the highest areas of desired information were about postoperative activities and knowing the right time to resume usual lifestyle . Bailey (2004) found that the most reported learning needs of hospitalized CABG patients were medications, risk factors, and anatomy and physiology while the least were physical activity, other information and psychological factors.

Conclusion

Escalating medical costs, limitation of resources and the necessity to provide cost-effective medical care have increased the need for assessment of the outcomes of any intervention or method of treatment (Merkouris et al., 2009).

Patients who have undergone CABG surgery often experience a lack of information and support for specific symptoms, therefore active symptoms assessment then management is needed, in addition hospitals had to extend patients' follow-up for at least one month after surgery so as to address the patients' physical and psychological needs and promote good health. A framework is needed on a national level to guide continuity of care and training nurses within hospitals and community settings, enabling them to carry out recommended practices regarding how to assess post-discharge symptoms and learning needs. Furthermore, removing obstacles, providing an adequate amount of budgets and pre-planning are essential to develop educational programs.

References

Al-Dukak, Zaher. (2011), Symptom management strategies of Jordanian patients following coronary artery bypass graft surgery. Un published thesis, Jordanian University of Science and Technology, Jordan.

Al- kubati, S., Al-Zaru, I., Khater, W., and Ammouri, A. (2012), Perceived learning needs of Yemeni patients after CABG surgery, Journal of Clinical Nursing, 22(7,8): 390-398.

Al- Qaissi, Nessrin. (2003), Perceived learning needs of Jordanian CABG surgery patients as compared to nursing staff. Unpublished thesis, Jordan University of Science and Technology, Jordan.

Bailey, D. E., Mishel, M. H., Belyea, M., Stewart, J. L., &Mohler, J. (2004), Uncertainty intervention for watchful waiting in prostate cancer. Cancer Nursing: An International Journal for Cancer Care, 27(5): 339–346.

Barnason, S., Zimmerman, L., and Anderson, A. (2000), Functional status outcomes of patients with a coronary artery bypass graft over time. Heart and Lung, 29 (1):33–6.

Beagley, Linda. (2011), Educating patients: understanding barriers, learning styles, and teaching technique.Journal of Perianesthesia Nursing, 26(5): 331-337.

Beggs, V., Willis, S., Maislen, E., Stokes, T., White, D., Sanford, M., Becker, A, Barber, S. (1998), Patient education for discharge after coronary bypass surgery in the 1990s: are patients adequately prepared? The Journal of Cardiovascular Nursing, 12(4):72–86.

Burke, C. (2003), Factors influencing uncertainty and health status outcomes in Coronary Artery Bypass Graft surgery patients. Published thesis, School of Nursing, Memorial University of Newfoundland. Canada.

Doering, L., McGuire, A and Rourke, D. (2002), Recovering from cardiac surgery: what patients want you to know. American Journal of Critical Care, 11(4): 333–334.

Fredericks, S. (2009b), the relationship between CABG patient characteristics and perceived learning needs: a secondary analysis. Canadian Journal of Cardiovascular Nursing, 19(1): 13-19.

Gao, F., Yao, K., and Tsai, C., and Wang, K. Y. (2009), Predictors of health care needs in discharged patients who have undergone coronary artery bypass graft surgery. Heart & Lung, 38(3):182-191.

Gallagher, R., and McKinley, S. (2009), Anxiety, depression and perceived control in patients having coronary artery bypass grafts, Journal of Advanced Nursing, 65(11): 2386-2396.

Gallagher, R., Mckinley, S., and Dracup, K. (2004), Post discharge problems in women recovering from coronary artery bypass graft surgery. Australian Critical Care,17: 160-165.

Gerard, P. S., and Peterson, L. M. (1984), Learning needs of cardiac patients, CardioVascular Nursing, 20(2): 7-11.

Hartford, K. (2005), Telenursing and patients' recovery from bypass surgery. Journal of Advanced Nursing, 50: 459–468. doi:10.1111/j.1365-2648.2005.03427.x

Hogue, J. C., Creswell, L., Gutterman, D., and Fleishe,r L. (2005), Epidemiology, mechanisms, and risks: American College of Chest Physicians guidelines for the prevention and management of postoperative atrial fibrillation after cardiac surgery. Chest, 128:9S-16S.

Johansson, I., Karlson, B., Grankvist, G., and Brink, E. (2010), Disturbed sleep, fatigue, anxiety and depression in myocardial infarction patients. European Journal of Cardiovascular Nursing; 9(3):175-180.

Jones, L. C. (2007), Gender analysis of learning needs in first time CABG patients: a secondary analysis, published thesis, Nursing School, Ryerson University, Toronto, Canada.

Jordanian Ministry of Health (JMOH). (2009), Mortality Data. JMOH Publications, Amman, Jordan.

Keeping, L. (2010), Bridging the Transition from Hospital-to-Home: Effects of the Vital Telehealth Program on Recovery in Coronary Artery Bypass Graft Surgery Patients and their Caregivers, Published Dissertation, Faculty of Medicine, School of Nursing, McGill University, Montreal, Canada.

Kelin-Fedyshin, M., Burda, M. L., and Epstein, B. A. (2005), Collaborating to enhance patient education & recovery. Journal of Medical Library Association, 93: 440-445.

Krannich, J. A., Weyers, P., Lueger, S., Hertzog, M., Bohrer, T., and Elert, O.(2007), Presence of depression and anxiety before and after coronary artery bypass graft surgery and their relationship to age, Psychiatry, 7 (47): 1-6.

Koivula, M., Halme, N., and stedt-Kurki, P. (2010), Predictors of depressive symptoms among coronary heart disease patients: A cross-sectional study nine years after coronary artery bypass grafting, Heart and Lung, 39: 421–431.

Koltzenburg, M. Classification of neuropathic pain. (2002), In Giamberandina MA, ed. Pain 2002VAn Updated Review: Refresher Course Syllabus. Seattle, WA: IASP Press, 149-154.

Lahtinen, P., Kokki, H., and Hynynen, M. (2006), Pain after cardiac surgery: A prospective cohort study of 1-year incidence and intensity. Anesthesiology, 105(4): 794-800.

Lee, S. (1995), Perceived information needs, uncertainty, and symptom intensity of Patients after Colon Resection for Cancer. Published thesis, University of Toronto, Nursing School, Canada.

Lie, I., Bunch, E., Smeby,N., Arnesen, H., and Hamilton, G. (2012), Patients' experiences with symptoms and needs in the early rehabilitation phase after coronary artery bypass grafting, European Journal of Cardiovascular Nursing, 11(1): 14– 24.

Lindsay, P., Sherrad, H., Bickerton, L., Doucette, P, Harkness, C., Harkness, C., and Morin, J. (1997), Educational and support needs of patients and their families awaiting cardiac surgery, Heart and Lung, 26: 458-465.

Lopez, V., Ying, C. K., Poon, C., and Wai, Y. (2007), Physical, psychological and social recovery patterns after CABG surgery: A prospective repeated measures questionnaire survey. International Journal of Nursing Studies, 44: 1304-1315.

Mallik, S., Krumholz, H.M, Lin, Z.Q, Kasl, S., Mattera, J., Roumains, S., and Vaccarino, V. (2005), Patients with depressive symptoms have lower health status benefits after coronary artery bypass surgery. Circulation; 111:271-7.

McCormick, K. M. (2001), Uncertainty, symptoms distress, and anxiety in patients waiting for coronary artery bypass surgery. Published thesis, University of Manisotoba, Faculty of Nursing, Canada.

Merkouris A, Apostolakis E, Pistolas D, Papagiannaki V, Diakomopoulou E, and Patiraki E. (2009), Quality of life after coronary artery bypass graft surgery in the elderly. European Journal of Cardiovascular Nursing; 8(1):74-81.

Mishel, M.H. (1997), Uncertainty in illness scales manual. University of North Carolina, Chapel Hill, NC: Unpublished Manuscript.

Mishel, M. H, Hostetter, T., King, B. and Graham, V. (1984), Predictors of psychosocial adjustment in patients newly diagnosed with gynecological cancer. Cancer Nursing, 7, 291–299.

Moore, S. M. (1994), Development of discharge information for recovery after coronary artery bypass surgery. Applied Nursing Research, 7(4): 170-177.

Niveen, J., Zimmerman, L., Barnason, S., and Yates, B. (2008), Development and content validity testing of the cardiac symptoms survey in patients after Coronary Artery Bypass Graft. Heart & Lung, 37: 17-27.

Parry, M., Watt-Watson, J., Hodnett, E., Tranmer, J., Dennis, C., and Brooks, D. (2010), Pain Experiences of Men and Women after Coronary Artery Bypass Graft Surgery, Journal of Cardiovascular Nursing, 25(3): E9-E15.

Pieper, B., Sieggreen, M., and Freeland, B. (2006), Discharge information needs of patients after surgery. Journal of Wound and Ostomy Continence in Nursing, 33: 281-291.

Redeker, N. (1993), Symptoms reported by older and middle aged adults after coronary bypass surgery. Clinical Nursing Research; 2(2):148–159.

Redeker, N. (2008), Sleep and Quality of Life in Cardiac Surgery. In: Joris C. Verster, S. R. Pandi-perumal, David L. Streiner, editors. Sleep and Quality of Life in Clinical Medicine. Humana Press; p.367-373.

Rymaszewska, J., Kiejna, A., and Hadry, T. (2003), Depression and anxiety in coronary artery bypass grafting patients. European Psychiatry; 18(4):155-160.

Schulz, P., Zimmerman, L., and Pozehl, B. (2011a), Symptom management strategies used by elderly patients after coronary artery bypass surgery, Applied Nursing Research, 24: 65–73.

Schulz, P., Lottman, D. J., Barkmeier, T. L., Zimmerman, L., Barnason, S., and Hertzog, M. (2011b), Medications and associated symptoms/problems after coronary artery bypass surgery. Heart & Lung, 40(2): 130-138. doi:10.1016/j.hrtlng.2010.03.003.

Tranmer, J. E, and Parry, M.J. (2004), Enhancing postoperative recovery of cardiac surgery patients. A randomized clinical trial of an advanced practice nursing intervention. Western Journal of Nursing Research, 26(5):515-532.

Utriyaprasit, K., Moore, S., and Chaiseri, P. (2010), Recovery after coronary artery bypass surgery: effect of an audiotape information programme, Journal of Advanced Nursing, 66(8): 1747–1759. doi: 10.1111/j.1365-2648.2010.05334.x

Watt-Watson, J., McGillion, M., Stevens, B., Costello, J. (2008), Patients' pain management following discharge home after cardiac surgery. European Journal of Cardiovascular Nursing,7-15.

Whitman, G. (2004), Nursing –sensitive outcomes in cardiac surgery patients. Journal of Cardiovascular Nursing, 19(5): 293-298.

Wijns, W., Kolh, P., and Danchin, N. (2010), Guidelines on myocardial revascularization: the Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS). European Heart Journal, 31(20): 2501-2555.

World Health Organization. Fact sheet N°317, Cardiovascular risk factors. http://www.who.int/mediacentre/factsheets/fs317/en/print.html 2007. [: date accessed: July 17, 2012]

Wu, Y. H, and Xu, S. (1995). Health care needs of hospitalized patients with coronary artery bypass graft surgery. Journal of Formos Medical Assocaition, 6:288-304.

Zimmerman, L., Barnason, S., Brey, B., Catlin, S., and Nieveen, J. (2002), Comparison of recovery patterns or patients undergoing coronary artery bypass graft and minimally invasive direct coronary artery bypass in the early discharge period. ProgCardiovascNurs; 17(1):132-141.

Zimmerman, L., Barnason, S., and Hertzog, M. (2011), Gender differences in recovery outcomes after an early recovery symptom management intervention. Heart & Lung, 40: 429-439.

Zimmerman, L., Barnason, S., Nieveen, J., and Schmaderer, M. (2004), Symptom Management Intervention in Elderly Coronary Artery Bypass Graft Patients. Outcomes Management, 8(1): 1-5.

Zimmerman, L., Barnason, S., Young, L., Tu, C., Schulz, P., and Abbott, A. (2010), Symptom Profiles of Coronary Artery Bypass Surgery Patients at Risk for Poor Functioning Outcomes, Journal of Cardiovascular Nursing, 25(4): 292-300.

Table (1): Demographic Characteristics of Jordanian CABG Patients (N=161)

Variable		N	(percentage)%
Gender	Female	69	42.9
	Male	92	57.1
Marital Status	Married	133	82.6
	Widow	28	17.4
Employment Status	employed	79	49.1
	not employed	82	50.9
Intended to return to work	Yes	81	50.3
	No	80	49.7
Educational information at the hospital	Yes	86	53.4
	No	75	46.6
Educational information at home	Yes	128	79.5
	No	33	20.5
Type of hospitals	Military Hospitals	139	86.3
	Teaching Hospitals	22	13.7
Variable		**M$\pm$ SD**	**Range**
Age		55.1$\pm$ 7.9	38-75 year
CICU LOS		2.9 $\pm$ 1.04	1-7 days
Hospital LOS		5.4 $\pm$ 3.7	2-18 days

Table (2): Symptoms Ranks and Mean Symptoms Evaluation (Symptoms Distress) among Jordanian CABG patients post discharge (N=161)

Symptom	Rank	Mean Symptom Frequency score (out of 10)$\pm$ SD	Mean Symptom Severity score $\pm$ SD	Mean Symptom evaluation Score (mean of frequency and severity) M $\pm$ SD
Chest/leg incision pain	1	2.48 $\pm$ 2.14	4.04 $\pm$ 1.83	3.26 $\pm$ 1.85
Anxiety	2	2.01 $\pm$ 1.79	3.65 $\pm$ 2.27	2.83 $\pm$ 1.9
Sleeping troubles	3	1.89 $\pm$ 2.98	2.51 $\pm$ 3.15	2.2 $\pm$ 3.0
Anorexia	4	1.46 $\pm$ 2.2	2.28 $\pm$ 2.66	1.87 $\pm$ 2.33
Fatigue	5	1.19 $\pm$ 2.2	1.57 $\pm$ 2.48	1.38 $\pm$ 2.29
Legs swelling	6	0.94 $\pm$ 1.99	1.4 $\pm$ 2.35	1.17 $\pm$ 2.1
Shortness of breath	7	0.85 $\pm$ 1.53	1.42 $\pm$ 1.99	1.1 $\pm$ 1.69
Angina	8	0.55$\pm$ 1.32	1.10 $\pm$ 1.99	0.82 $\pm$ 1.59
Depression	9	0.69 $\pm$ 2.1	0.73 $\pm$ 2.2	0.71 $\pm$ 2.14
Fluttering /tachycardia	10	0.61 $\pm$ 1.55	0.79 $\pm$ 1.9	0.70 $\pm$ 1.7

Table (3): Learning Needs of Jordanian CABG Patients (N=161)

CPLNI subscale	Rank	Mean $\pm$ (SD)
Wound care	1	4.83 $\pm$ 0.40
Complication information	2	4.73 $\pm$ 0.46
Psychological Factors	3	4.36 $\pm$ 0.67
Medication information	4	4.33 $\pm$ 0.78
Diet information	5	4.30 $\pm$ 0.68
Other information	6	4.24 $\pm$ 0.62
Anatomy & Physiology	7	4.23 $\pm$ 0.77
Risk factors	8	4.17 $\pm$ 0.73
Physical activity	9	3.97 $\pm$ 0.95