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Assessment of nurses' knowledge, attitude and perception on cardiac rehabilitation program at a tertiary care teaching hospital

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ABSTRACT

Cardiac rehabilitation is very essential for patient who suffer from cardiac diseases to improve their quality of life during pre and post hospitalization period. The main objectives of this research was to assess the knowledge, attitude and perception of nurses on cardiac rehabilitation program (CRP), and relate the relationship between socio-demographic characteristics, qualifications and years of experience with their knowledge, attitude and perception on CRP. The study was carried out using a structured validated questionnaire consists of 46 items measuring socio-demographic details, knowledge, attitudes and perception of nurses on CRP. The 6-point Likert's scale was used to record individual's responses for the questionnaire which varies from strongly disagree to strongly agree. Female, aged between 21 and 40 years predominantly dominates in our study with the basic diploma education in nursing. There was a significant different between age, education, and years of working experience of nurses with their knowledge on CRP, however, no significance difference was observed between age, sex, education and years of working experience with their attitude and perception towards CRP. In this study the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines was used for reporting the observational study findings. The study findings suggest that the role of nurses in providing endorsement to patients regarding CRP in hospitals is a major indicator that is bound to improve participation rates in CRP which will enable the patients to avail better healthcare and reduction in morbidity and mortality related to cardiovascular deaths (CVDs).



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INTRODUCTION

Cardiovascular diseases (CVDs) are the number one cause of death globally, taking an estimated 17.9 million lives each year. More than 75% of the CVD deaths occur in low and middle income countries, and 85% of deaths are mainly due to heart attacks and stroke (WHO, 2019). Although mortality from coronary heart disease has fallen over recent decades, annually it still claims an estimated 1.8 million lives in Europe, and 785 000 new and 470 000 recurrent myocardial infarctions occur in the US. In the UK, around 110 000 men and 65 000

women have an acute myocardial infarction every year, equivalent to one every three minutes (Balady et al., 2011). CVDs related morbidity and mortality in the world with the burden expected to rise to over 80 million cases by the year 2020 (WHO, 2009).

Patients with CVD tend to experience many problems regarding the outcome of the disease or rehabilitation after a major cardiovascular event especially in their quest to return their previous life. The process of recovering from a cardiac event in it is a complex procedure that presents a major challenge to both the psychological and physical being of any individuals because of the constant and continued care that such people need after discharge from the hospital. CR has evolved over the years from just a simple monitoring of health condition for the safe return to physical activities to a multidisciplinary approach that is tailor-made to focuses on individual patient education, exercise training, modification of the risk factors and the overall well-being of the cardiac patients (Suaya et al., 2007). This form of rehabilitation has been proved to be quite effective in providing care for patients with these cardiovascular conditions including ischemic heart disease, heart failure and post heart surgery. The major benefits of CRP among patients include the reduction of mortality and morbidity, symptom relief, improved exercise tolerance as well as the overall psychosocial wellbeing.

Cardiac rehabilitation (CR) involves some form of outpatient program that is structured to include various activities such as exercises, education, psychosocial support, as well as risk reduction (Gianuzzi, 2003). These activities are done comprehensively with the help of health care providers with the aim of promoting optimal functioning of the body system. The participation in these CRP has been shown to result in the improvement of health behaviour exercise capacity as well as promoting psychological wellbeing, thereby reducing instances of re-hospitalization and death. Studies have shown that CR is widely recognized in the field of clinical medicine as one of the best practice guidelines in cardiac care provision by many health care providers including the American Heart Association and others.

Moreover, despite all these potential benefits of seeking CRP, their enrolment remains quite low despite governments spending over 50% of their health budgets in reducing mortality associated with CVD (Dagnelie et al., 2010). However, in Malaysia, the government spend almost 10% of its annual budget for healthcare (Malaysia-Healthcare, 2019). There exist many reasons why a cardiac

patient failed to embrace these CRP which are multifactorial and covers a wide spectrum including the health system, health care providers and patient-related factors. For instance, the attendance of CRP is often influenced by various factors including physicians, education of the intended program, referral practices among others.

The role that health care providers in ensuring the development of CRP can never be underestimated as physicians and nurses often play a critical role in referrals and enrolment of patients. However, despite the established benefits of these rehabilitative programs, cardiac rehabilitation enrolment remains considerably underutilized and persuasively low due to multifactorial factors. Health care workers and healthcare systems need to improve effective management of CVD with major effect in primary and secondary prevention through collaborative partnership with patients and families, a way to tackle these challenging health issue (WHO, 2009). As a member of multidisciplinary team; nurses have significant contributions in the implementation of secondary prevention in clinical practices and to do this, basic understanding of educational and behavioral theory is very essential. A number of studies have now investigated healthcare worker's factors associated with referral to CRP and patient enrolment. There are also limited studies regarding cardiac rehabilitative services in Malaysia which has since necessitated this research study. The main objectives of the study were to assess the knowledge, attitude and perception of nurses on CRP and to relate the relationship between socio-demographic characteristic, qualifications and years of experience with their knowledge, attitude and perception of CRP.

METHODOLOGY

Study design and duration

A cross-sectional study was carried out at a 1100 bed tertiary care teaching hospital with four subdivisions such as critical care unit, ambulatory, inpatient and emergency unit. The study was carried out from August to November 2019 for a period of 4 months.

Study population and sampling size

The study population consist of all the registered nurses who offer CRP at cardiology department of the hospital and willing to participate in this research. Nurses working in other departments except cardiology and those who are not willing to participate were excluded from this study. There were 124 registered nurses working at cardiac unit

Table 1: Demographic characteristics of the respondents (n=92)

| Variable | Frequency | Percentage |
|---------------------|-----------|------------|
| Age in years | | |
| 21-30 | 55 | 59.8% |
| 31-40 | 33 | 35.9% |
| 41-50 | 4 | 4.3% |
| Sex | | |
| Male | 13 | 14.1% |
| Female | 79 | 85.9% |
| Education | | |
| Diploma | 56 | 60.9% |
| Post Basic | 33 | 35.9% |
| Degree | 3 | 3.3% |
| Years of experience | | |
| 1-3 | 32 | 34.8% |
| 4-8 | 35 | 38.0% |
| 9 and above | 25 | 27.2% |
| Attended CNE | | |
| Yes | 28 | 30.4% |
| No | 64 | 69.6% |

during the study period and the sample size was estimated using Raosoft sample size calculator; by using this calculation, total sample were 92 (n=92).

Research Instrument

The study instrument consists of a total of 46 questions under 3 sections; the first section has 5 questions to analyse the respondents' sociodemographic details, second section has 22 questions to analyse the respondents' knowledge on CRP and the last section consists of 19 questions to analyse the attitudes and perception of respondents' on CRP. The CRP knowledge, attitudes and perception questionnaire was adopted from previous studies ([Bala et al., 2011](#); [Babakus and Mangold, 1992](#); [Degavi and Bhupali, 2015](#)) with prior approval. The 6-point Likert's scale was used to record individual's responses for the questionnaire which varies from strongly disagree to strongly agree. The responses strongly agree, agree and somewhat agree were summed to get net positive responses (NPR) and the responses strongly disagree, disagree and somewhat disagree were summed to get net other responses (NOR). In order to check the readability, reliability and clarity of the questionnaire, a pilot study was carried out using 10 - 15 participants, in which they were excluded from the actual study. The length of time to complete the questionnaire was about 10-15 minutes. After the pilot study, no amendments were done to the questionnaires. Several variables were analysed in this study, the independent variables such as respondents socio-demographics like age,

sex, education, and years of working experience, dependent variables like participation in CNE program, knowledge, attitude and perception on CRP were analysed.

Data collection and analysis

Prior to data collection, the number of nurses working in the study setting was identified. Informed consent was obtained prior to inception in to the study and, to ensure the participants' anonymity a random code number was given to all the nurses who took part the survey. The structured questionnaire was then circulated to the participants, which focused respondents' demography, role of nurses and their knowledge, attitude and perception on CRP. Moreover, so as to ensure trustworthiness in the process of data analysis, the extensive use of direct quotations from themes systematic coding was incorporated. The collected data was tabulated, analysed using SPSS 25.0 for statistical calculation. Descriptive statistics and other statistical tests were performed on the collected data. Cronbach alpha was used to check validity and reproducibility of the items of the questionnaire, it was observed at 0.965 during the pilot study.

Ethical approval

Ethical permission was obtained from the research ethical review committee prior to start of this study. In this study the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines was used for reporting the observation.

Table 2: Mean knowledge, attitude and perception scores of the respondents (n=92)

| Variables | Mean±SD | Median (IQR) | Minimum | Maximum |
|-----------------------|----------|--------------|---------|---------|
| Knowledge | 13.8±5.7 | 15.0 (9.5) | 0 | 21 |
| Attitude & Perception | 9.5±5.6 | 11.0 (9.7) | 0 | 19 |

Table 3: Comparison of knowledge score by demographic characteristics (n=92)

| Variable | Median (IQR) | p-value |
|---------------------|--------------|---------|
| Age in years | | |
| 21-30 | 1.0 (10.0) | <0.001* |
| 31-40 | 19.0 (6.5) | |
| 41-50 | 17.0 (3.5) | |
| Sex | | |
| Male | 11.0 (12.0) | 0.243 |
| Female | 15.0 (9.0) | |
| Education | | |
| Diploma | 11.5(9.8) | <0.001* |
| Post Basic | 16.0 (6.0) | |
| Degree | 20.0 (1.0) | |
| Years of experience | | |
| 1-3 | 11.0 (9.3) | <0.001* |
| 4-8 | 14.0 (11) | |
| 9 and above | 19.0 (5.5) | |
| Attended CNE | | |
| Yes | 16.0 (7.75) | 0.216 |
| No | 14.0 (10.8) | |

*Statistically significant

Table 4: Comparison of attitude and perception score by demographic characteristics (n=92)

| Variable | Median (IQR) | p-value |
|---------------------|--------------|---------|
| Age in years | | |
| 21-30 | 9.0 (9.0) | 0.215 |
| 31-40 | 12.0 (9.5) | |
| 41-50 | 11.0 (11.3) | |
| Sex | | |
| Male | 9.0 (10.0) | 0.982 |
| Female | 11.0 (10.0) | |
| Education | | |
| Diploma | 9.0 (8.8) | 0.271 |
| Post Basic | 12.0 (11.5) | |
| Degree | 15.0 (10.0) | |
| Years of experience | | |
| 1-3 | 8.5 (9.5) | 0.070 |
| 4-8 | 11.0 (9) | |
| 9 and above | 12.0 (7.5) | |
| Attended CNE | | |
| Yes | 1.0 (11.0) | 0.832 |
| No | 10.5 (9.0) | |

Table 5: Respondents scores of the individual items of the knowledge, attitude and perception assessment questionnaire (n=92)

| S. No | Items | Strongly Dis-agree n(%) | Disagree n(%) | Somewhat disagree n(%) | Somewhat agree n(%) | Agree n(%) | Strongly Agree n(%) |
|-------------------------|--|-------------------------|---------------|------------------------|---------------------|------------|---------------------|
| Knowledge on CRP | | | | | | | |
| 1 | Rehabilitation means restoration of normal life | 2(2.2) | 6(6.5) | 2(2.2) | 10(10.9) | 51(55.4) | 21(22.8) |
| 2 | Cardiac Rehabilitation aims | 1(1.1) | 0 | 2(2.2) | 11(12) | 66(71.7) | 12(13) |
| 3 | Goals of Cardiac rehabilitation | 1(1.1) | 0 | 3(3.3) | 16(17.4) | 59(64.1) | 13(14.1) |
| 4 | Indication of Cardiac rehabilitation | 2(2.2) | 3(3.3) | 3(3.3) | 14(15.2) | 55(59.8) | 15(16.3) |
| 5 | Contraindication for Cardiac rehabilitation | 5(5.4) | 13(14.1) | 12(13) | 29(31.5) | 22(23.9) | 11(12) |
| 6 | Key elements of cardiac rehabilitation | 1(1.1) | 1(1.1) | 2(2.2) | 13(14.1) | 51(55.4) | 24(26.1) |
| 7 | Types of cardiac rehabilitation | 2(2.2) | 3(3.3) | 18(19.6) | 20(21.7) | 36(39.1) | 13(14.1) |
| 8 | Members of cardiac rehabilitation team | 12(13) | 9(9.8) | 11(12) | 16(17.4) | 32(34.8) | 12(13) |
| 9 | The factor which does not influence functional | 4(4.3) | 7(7.6) | 18(19.6) | 26(28.3) | 28(30.4) | 9(9.8) |
| 10 | Areas of cardiac rehabilitation | 0 | 2(2.2) | 3(3.3) | 13(14.1) | 54(58.7) | 20(21.7) |
| 11 | Education in cardiac rehabilitation program | 0 | 0 | 2(2.2) | 18(19.6) | 52(56.5) | 20(21.7) |
| 12 | Risk factors for Coronary diseases | 1(1.1) | 0 | 0 | 9(9.8) | 52(56.5) | 30(32.6) |
| 13 | Cardiac rehabilitation | 1(1.1) | 0 | 5(5.4) | 26(28.3) | 41(44.6) | 19(20.7) |
| 14 | Definition of Phase 1 of Cardiac rehabilitation | 0 | 1(1.1) | 4(4.3) | 28(30.4) | 43(46.7) | 16(17.4) |
| 15 | Activities of Cardiac rehabilitation Phase 1 | 1(1.1) | 0 | 3(3.3) | 20(21.7) | 53(57.6) | 15(16.3) |
| 16 | Passive exercises done during cardiac rehabilitation | 1(1.1) | 0 | 5(5.4) | 26(28.3) | 43(46.7) | 17(18.5) |
| 17 | Definition of Cardiac rehabilitation Phase 2 | 0 | 0 | 5(5.4) | 33(35.9) | 41(44.6) | 13(14.1) |
| 18 | Activities in the Cardiac rehabilitation Phase 2 | 3(3.3) | 7(7.6) | 12(13) | 29(31.5) | 34(37) | 7(7.6) |
| 19 | Definition of Phase 3 of Cardiac rehabilitation | 0 | 0 | 3(3.3) | 42(45.7) | 36(39.1) | 11(12) |
| 20 | A Cardiac rehabilitation nurse act as Counsellor | 2(2.2) | 1(1.1) | 8(8.7) | 24(26.1) | 45(48.9) | 12(13) |
| 21 | Benefit of Cardiac rehabilitation | 0 | 0 | 0 | 24(26.1) | 46(50) | 22(23.9) |
| 22 | Nurses responsibility in Cardiac rehabilitation | 1(1.1) | 1(1.1) | 2(2.2) | 25(27.2) | 42(45.7) | 21(22.8) |

Continued on next page

Table 5 continued

| S. No | Items | Strongly Dis-agree n(%) | Disagree n(%) | Somewhat disagree n(%) | Somewhat agree n(%) | Agree n(%) | Strongly Agree n(%) |
|--|--|-------------------------|---------------|------------------------|---------------------|------------|---------------------|
| Attitude and perception towards CRP | | | | | | | |
| 1 | Familiar with cardiac rehabilitation program (CRP) | 0 | 2(2.2) | 8(8.7) | 42(45.7) | 28(30.4) | 12(13) |
| 2 | My organization has CRP policies | 0 | 0 | 5(5.4) | 25(27.2) | 46(50) | 16(17.4) |
| 3 | Location of organization's policies on CRP | 0 | 1(1.1) | 8(8.7) | 42(45.7) | 31(33.7) | 10(10.9) |
| 4 | No time to refer patient for cardiac rehabilitation | 14(15.2) | 21(22.8) | 19(20.7) | 22(23.9) | 13(14.1) | 3(3.3) |
| 5 | Sufficient leadership support and resources to implement and comply with CRP | 2(2.2) | 3(3.3) | 8(8.7) | 28(30.4) | 39(42.4) | 12(13) |
| 6 | In this organization, CRP are important | 0 | 0 | 3(3.3) | 20(21.7) | 42(45.7) | 27(29.3) |
| 7 | Skeptical about the benefits of CRP | 6(6.5) | 10(10.9) | 10(10.9) | 32(34.8) | 28(30.4) | 5(5.4) |
| 8 | Necessary information and proper authority in CRP referral | 2(2.2) | 2(2.2) | 7(7.6) | 33(35.9) | 36(39.1) | 11(12) |
| 9 | Consistent referral to CRP will prevent cardiovascular disease | 1(1.1) | 4(4.3) | 6(6.5) | 27(29.3) | 38(41.3) | 16(17.4) |
| 10 | Referral to CRP will reduce readmissions | 0 | 3(3.3) | 9(9.8) | 26(28.3) | 32(34.8) | 22(23.9) |
| 11 | Consistent CRP strategies will not will positively impact patient outcomes | 13(14.1) | 7(7.6) | 17(18.5) | 27(29.3) | 22(23.9) | 6(6.5) |
| 12 | My leadership expects that I should participate in CRP in every cardiac patients | 0 | 5(5.4) | 6(6.5) | 36(39.1) | 33(35.9) | 12(13) |
| 13 | To reduce readmissions, comply with CRP strategies | 0 | 0 | 5(5.4) | 34(37) | 40(43.5) | 13(14.1) |
| 14 | My colleagues comply with CRP referral | 1(1.1) | 1(1.1) | 8(8.7) | 42(45.7) | 34(37) | 6(6.5) |
| 15 | Organization have dedicated staff conducting CRP | 3(3.3) | 3(3.3) | 7(7.6) | 37(40.2) | 35(38) | 7(7.7) |
| 16 | Workloads impede my ability to comply with CRP referral | 2(2.2) | 5(5.4) | 8(8.7) | 32(43.8) | 39(42.4) | 6(6.5) |
| 17 | CRP are realistic in our unit | 2(2.2) | 1(1.1) | 2(2.2) | 28 (30.4) | 48(52.2) | 11(12) |
| 18 | I have necessary knowledge on CRP | 2(2.2) | 0 | 9(9.8) | 45(48.9) | 34(37) | 2(2.2) |
| 19 | CRP referral will improve as directed | 2(2.2) | 0 | 1(1.1) | 26(28.3) | 45(48.9) | 18(19.5) |

RESULTS AND DISCUSSION

Demographic characteristics of respondents

In this study, 92 nurses those working in cardiac unit of UMMC were approached and all responded with the filled questionnaire and the response rate was 100%. Majority (59.8%) of the respondents were between 21 and 30 years old, 85.9% were females, 60.9% had diploma level of education and 69.6% have not attended Continuous Nursing Education (CNE). In terms of years of experience, 32(34.8%), 35(38.0%) and 25(27.2%) respondents had 1-3 years, 4-8 years and more than 8 years of experience respectively. The demographic characteristics of the respondents are tabulated in Table 1.

Assessment of respondents' knowledge, attitudes and perception on CRP

There were 22 items in the knowledge section of the questionnaire. Each item was assessed on six-points Likert's scale (1= Strongly Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Strongly Agree). The answers were recoded into as 1 for correct answer and 0 for incorrect answers. Hence the individual knowledge score ranged from 0 to 22. For attitude and perception, there were 19 items. Again, answers for each item was coded as 1 for positive attitude and perception and 0 for negative attitude and perception. The individual attitude and perception score ranged from 0 to 19. The results are shown in Table 2.

Association between knowledge score and demographic characteristics

Since, the knowledge score was not distributed normally, the associations between knowledge score and demographic characteristics were tested using non parametric Mann-Whitney (for 2 groups) and Kruskal-Wallis (for > 2 groups).

There were significant differences in knowledge score by age, education and years of experience. For age, the median score for those 21-30 years old was significantly lower compared to those who were 31-40 years old. For educations, the median score for those with diploma level of education was lower compared to those with post basic and degree. For years of working experience, the median score for those who have worked for 9 years and above was significantly higher compared to those eight years and below. The associations between knowledge score and demographic characteristics are shown in Table 3.

Association between attitude and perception score and demographic characteristics

Since, attitude and perception score was not dis-

tributed normally, the associations between attitude and perception score and demographic characteristics were tested using non parametric Mann-Whitney (for 2 groups) and Kruskal-Wallis (for > 2 groups). There were no significant differences in attitude and perception score by any of the demographic characteristics. The associations between attitude and perception score and demographic characteristics are shown in Table 4. Responses to individual items of the questionnaire were calculated using Likert's scale; the net positive responses, and net other responses were summed using the varying responses. The details are presented in Tables 5 and 6.

Relationship with demographic factors and CRP

Nurses play a major role in the appropriate delivery of healthcare especially the junior nurses who posted in wards immediately after their graduation facing varieties of complicated cases as well and exposed to multitasking. In our study, most of the nurses were below the age of 30, female with a basic diploma level of nursing qualification. This is similar to many studies where most of the respondents were below the age of 30 years (Choure et al., 2015; Chow et al., 2017; Salahat and Faris, 2014), female and undergraduates or diploma holders (Choure et al., 2015; Chow et al., 2017). Female are keen to choose the nursing program as they are more comfortable in the care of patients and elderly people.

Diploma level education is the basic entry level requirements for nursing practice and only small number of nurses is able to go for higher studies either as full-time or part-time to upgrade the qualification and career positions. This may be due to the fact that financial and family commitments of the young nurses not to opt higher studies. Institutions attached to this hospital play a major role in promoting higher education among the nurses who are interested to pursue higher degrees.

This is similar to The Future of Nursing, transformation of nursing education which includes the current transformation of healthcare system and practice environments. In this report, it was mentioned that nurses need to achieve higher levels of education for them to work collaboratively and effectively as partners with other professional groups in these complex and challenging system (Stuart et al., 2016). Nursing Board of Malaysia has to enhance and plan program as such for nurses to achieve higher levels of education and training through an improved education system that promotes seamless academic progression.

In this study, quite number of nurses did not attend

Table 6: Comparisons of the positive and other responses of the respondents in the knowledge, attitude and perception assessment questionnaire (n=92)

| No | Items | Mean ±SD | Positive response n(%) | Other responses n(%) |
|------------------|--|----------------|------------------------------|----------------------------|
| Knowledge | | | | |
| 1 | Rehabilitation means restoration of normal life | 4.79 ±1.153 | 72 (78.3) | 20 (21.7) |
| 2 | Cardiac Rehabilitation aims | 4.92 ±0.715 | 78 (84.8) | 14 (15.2) |
| 3 | Goals of Cardiac rehabilitation | 4.86 ±0.779 | 72 (78.3) | 20 (21.7) |
| 4 | Indication of Cardiac rehabilitation | 4.76 ±1.020 | 70 (76.1) | 22 (23.9) |
| 5 | Contraindication for Cardiac rehabilitation | 3.90 ±1.383 | 33 (35.9) | 59 (64.1) |
| 6 | Key elements of cardiac rehabilitation | 5.00 ±0.877 | 75 (81.5) | 17 (18.5) |
| 7 | Types of cardiac rehabilitation | 4.35 ±1.171 | 49 (53.3) | 43 (46.7) |
| 8 | Members of cardiac rehabilitation team | 3.90 ±1.604 | 44 (47.8) | 48 (52.2) |
| 9 | The factor which does not influence functional | 4.02 ±1.266 | 37 (40.2) | 55 (59.8) |
| 10 | Areas of cardiac rehabilitation | 4.95 ±0.830 | 74 (80.4) | 18 (19.6) |
| 11 | Education in cardiac rehabilitation program | 4.98 ±0.711 | 72 (78.3) | 20 (21.7) |
| 12 | Risk factors for Coronary diseases | 5.18 ±0.755 | 82 (89.1) | 10 (10.9) |
| 13 | Cardiac rehabilitation | 4.77 ±0.915 | 60 (65.2) | 32 (34.8) |
| 14 | Definition of Phase 1 of Cardiac rehabilitation | 4.75 ±0.834 | 59 (64.1) | 33 (35.9) |
| 15 | Activities of Cardiac rehabilitation Phase 1 | 4.84 ±0.816 | 68 (73.9) | 24 (26.1) |
| 16 | Passive exercises done during cardiac rehabilitation | 4.75 ±0.897 | 60 (65.2) | 32 (34.8) |
| 17 | Definition of Cardiac rehabilitation Phase 2 | 4.67 ±0.786 | 54 (58.7) | 38 (41.3) |
| 18 | Activities in the Cardiac rehabilitation Phase 2 | 4.14 ±1.182 | 41 (44.6) | 51 (55.4) |
| 19 | Definition of Phase 3 of Cardiac rehabilitation | 4.60 ±0.742 | 47 (51.1) | 45 (48.9) |
| 20 | A Cardiac rehabilitation nurse act as Counsellor | 4.58 ±1.008 | 57 (62) | 35 (38) |
| 21 | Benefit of Cardiac rehabilitation | 4.98 ±0.711 | 68 (73.9) | 24 (26.1) |
| 22 | Nurses responsibility in Cardiac rehabilitation | 4.84 ±0.917 | 63 (68.5) | 29 (31.5) |

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Table 6 continued

| No | Items | Mean ±SD | Positive response n(%) | Other responses n(%) |
|--------------------------------|--|----------------|------------------------------|----------------------------|
| Attitude and Perception | | | | |
| 1 | Familiar with cardiac rehabilitation program (CRP) | 4.43 ±0.905 | 40 (43.5) | 52 (56.5) |
| 2 | My organization has CRP policies | 4.79 ±0.792 | 62 (67.4) | 30 (32.6) |
| 3 | Location of organization's policies on CRP | 4.45 ±0.843 | 41 (44.6) | 51 (55.4) |
| 4 | No time to refer patient for cardiac rehabilitation | 3.09 ±1.396 | 16 (17.4) | 76 (82.6) |
| 5 | Sufficient leadership support and resources to implement and comply with CRP | 4.47 ±1.074 | 51 (55.4) | 41 (44.6) |
| 6 | In this organization, CRP are important | 5.01 ±0.805 | 69 (75) | 23 (25) |
| 7 | Skeptical about the benefits of CRP | 3.92 ±1.328 | 34 (37) | 58 (63) |
| 8 | Necessary information and proper authority in CRP referral | 4.45 ±1.025 | 48 (52.2) | 44 (47.8) |
| 9 | Consistent referral to CRP will prevent cardiovascular disease | 4.58 ±1.061 | 54 (58.7) | 38 (41.3) |
| 10 | Referral to CRP will reduce readmissions | 5.18 ±5.250 | 54 (58.7) | 38 (41.3) |
| 11 | Consistent CRP strategies will not will positively impact patient outcomes | 3.61 ±1.460 | 28 (30.4) | 64 (69.6) |
| 12 | My leadership expects that I should participate in CRP in every cardiac patients | 4.45 ±0.987 | 45 (48.9) | 47 (51.1) |
| 13 | To reduce readmissions, comply with CRP strategies | 4.66±0.788 | 53 (57.6) | 39 (42.4) |
| 14 | My colleagues comply with CRP referral | 4.36 ±0.859 | 40 (43.5) | 52 (56.5) |
| 15 | Organization have dedicated staff conducting CRP | 4.29 ±1.054 | 42 (45.7) | 50 (54.3) |
| 16 | Workloads impede my ability to comply with CRP referral | 4.29 ±1.054 | 45 (48.9) | 47 (51.1) |
| 17 | CRP are realistic in our unit | 4.65 ±0.919 | 59 (64.1) | 33 (35.9) |
| 18 | I have necessary knowledge on CRP | 4.25 ±0.834 | 36 (39.1) | 56 (60.9) |
| 19 | CRP referral will improve as directed | 5.18 ±3.883 | 62 (67.4) | 29 (31.5) |

the CNE program which was conducted by the expertise; which could be due to their busy working schedule with their day-to-day nursing activities or they may not aware of the importance of CNE program. CNE is vital for every practicing nurses as it deliver the current updates in the medical field and advancement in the nursing practice to the healthcare professionals. Updating their current knowledge is very important and it is essential to deliver and administer appropriate drug therapy to patients as care within the hospital setting continues to grow more complex and critical decision making is needed at all-time especially in this setting with sophisticated and life-saving technology coupled with complex information management systems requiring advanced skills and knowledge. Every healthcare centre should promote and encourage their healthcare providers to attend at least a minimum number of CNE required or continuous professional education program on a rotation basis. The CNE program could be planned, developed and implemented to respond to identify educational deficiencies among nurses.

Knowledge on CRP

The mean knowledge score (17.70 ± 7.31) of study participants on CRP was considerably good, as the average score was more than 62.8% (17.7 out of 22) which is higher than other studies carried out in India where majority (78.33%) of the nurses had poor knowledge on CRP, they scored 0-10 out of 30 (Choure et al., 2015). Nurses with higher degree scored more on CRP knowledge components compared to diploma level as the higher education focus more components of CRP and nurses practice in CRP than diploma education. It was contrast to a study, there were no significant association between professional degree and the test score as the nurses with diploma scored more than the post graduates (Choure et al., 2015). However, the standard of diploma curriculum in Malaysia was considered as good as it covers all the essential elements required for an ideal nurse and the tutors deliver all the essential components of CRP that required to improve patient health outcomes. The score was high among the senior nurses who has more year of nursing practice experience as they are exposed to varieties of Cardiac Rehabilitation cases and patients with different health conditions. Apart from academic qualifications, the experience in the real field of nursing practice play a major role in acquiring knowledge that required for practice. This finding is contrast to a study (Chow et al., 2017) where the average score for the knowledge on CRP was 12.27 out of 18 (SD 2.38), which is higher than the respondents mean score in this

study. Nurse educators play a major role in improving the knowledge among nurses through academic teaching, ward round participation and delivery of healthcare.

Attitude and perception towards CRP

The mean score for attitude and perception (9.5 ± 5.6) was not in satisfactory level as the score is below than the average, it was only 50% (9.5 out of 19). This may be due to the fact that the nurses' attitude towards attending CRP was very less, and only less number of nurses were participated in the CRP and CNE training programme, this may directly impact on their practices in their day-to-day activities. These findings are similar to a study in that the healthcare professionals achieved a very low score on the perceived knowledge on CRP (Salahat and Faris, 2014). This may be due to the lack of enough studies in CRP and the absence of CRP in their country. In contrary to this, the nurses had a good positive attitude towards the cardiovascular risk reduction where they scored more than 80% across all risk factors related to CVD (Wu et al., 2011).

In this study, majority of the nurses knew that rehabilitation means restoration of normal life and the aim, goal and indications of cardiac rehabilitation. It is similar to a study where the nurses had good knowledge on the CRP programme's aim and purpose (Fridlund, 2002). Exercise-based cardiac rehabilitation proved to be effective in restoring health and in reducing cardiovascular mortality and hospital admissions (Chow et al., 2017).

However, most of the nurses were unaware of the contraindications and risk factors which influence on CRP. Only 2 out of 3 nurses were aware of the different phases of cardiac rehabilitation programme and the activities related to each phase of the CRP. It is an alarming situation where there is lot of room for errors and mishandling of patients which may cause adverse outcomes in the patients' health. The findings are similar to a study, where only 70 percent of the nurses knew the risk factors of cardiovascular diseases and only one third can able to identify the target goals for risk reduction (Wu et al., 2011), it may lead to inappropriate delivery of healthcare and serious health hazards to patients.

Cardiac rehabilitation program, phase-1 focused on the individual physical mobilisation and current medical condition. In this situation, nurses play a role as good listener, active receiver and counsellor for patient and their families. Phase-2 starts after discharge and focuses on discharge planning education towards lifestyle changes in community in which nurse's act as coach and educator to educate in preventing further diseases. Phase-3 of educat-

ing and supporting healthy lifestyle are also being applied by patient organisations, insurance companies, as well as spa and fitness companies.

Unfortunately, more than 60 percent of the nurses were unaware of their roles and responsibilities in CRP. This may be due to the fact that the program is newly established in the current practice with the increasing demand on cardiac rehabilitation. Hence, nurses in the current hospital were not been exposed or been briefed the importance of the program and the benefits towards patient outcomes. Even though they were time bound and busy with their routine duties in hospital, and most are looking for a break from their tiring workloads instead of attending any CNE or CRP training program, 30.4% of them were familiar with the CRP and its benefits to the patients' health outcomes by attending the CNE.

More than 60 percent of the nurses were aware of the CRP policies of the organization, however many were unaware of the location of organisation's policies on CRP. The goal of cardiac rehabilitation is to help patients to live a longer, better-quality of life and to return to their normal daily activities; however, the myths conveyed by nurses could greatly affect the patients' recovery and lead to unnecessary anxieties and complications (Chow et al., 2017). It is contrast to a study that the participants reported that resources and legislations within their facilities were not supportive to the establishment of CRPs. Further, health professionals reported that CRP improves and is improved by the formation of multidisciplinary team approach (Salahat and Faris, 2014).

Most of the nurses agree that they have enough time to refer the patients to CRP and felt that the CRP is very important in their organization. The organization play a vital role in bringing out better health outcomes in CRP patients through providing appropriate rehabilitation and intervention. Many nurses believe and consistently refer CRP to patients to prevent cardiovascular diseases, and believe it will reduce readmission of cardiac patients and bring positive impact on patient outcomes. Similar to the study, On the effect of CRP, health professionals indiscriminately believed that CRP promotes both their practice and improve patient health outcome, such as the psychosocial, physical and mental health outcomes approach (Salahat and Faris, 2014).

Less than half of the respondents said their leadership expects them to participate in CRP of every cardiac patient. The lack of support from leadership adversely affects the nurses from gaining more knowledge on CRP and it negatively impact appro-

priate referral and health outcome of patient. Multidisciplinary team need to address all phases in the training: assessment, intervention and evaluation by the team for a concrete process of therapeutic education as it is 'vision' of global care of patient.

Many of the respondents said they don't have dedicated staffs to conduct CRP in their hospital and heavy workloads impede their ability to comply with CRP referral. This is a worrying situation now, if it is not resolved immediately it will adversely impact the health of the patients. Most of the respondents have only average to moderate level knowledge of CRP and few have good knowledge on CRP. The current situation is considered as unhealthy as the lack of knowledge may lead to inappropriate selection and delivery of healthcare, which will spoil the health of the patients anytime.

Recommendation

The study strongly recommends, and encourage all healthcare professionals to conduct many more studies on the thurst area of CRP as it play a vital role in the life of cardiac patients. Further, the study would suggest the hospital management to plan a well-developed, deliberate and repeated session of CRP in the hospital to ease of participation of all HCPs. Periodical meditation, yoga and other stress relieving exercise or programme may benefit the healthcare professionals to get rid of their stressful situation and to perform better in their clinical services.

Limitations

The sample size was less to get more appropriate results and the responses may be slightly biased due to their intention to maintain their reputation and institutional image. The findings may not be the overall reflection of healthcare providers on CRP as the study included only the nurses working in cardiac unit and no other healthcare providers were included as this program is multidisciplinary team effort. This study was conducted in a single organization in teaching hospital, which may limit the generalize of the study findings to all healthcare setting.

CONCLUSIONS

CRP is one of the most proven strategies that are used worldwide to improve the quality of life of cardiovascular patients' thereby reducing morbidity and mortality associated with such illnesses. The healthcare providers including nurses, cardiologists and other physicians have an important role in providing both pre and post-operative education and counselling thereby aiding patients in reducing the instance of anxiety and pain. Consequently,

the advent of new technologies has also introduced newer ways through which cardiac rehabilitative referrals can be sought which in turn increases participation rates which have persuasively low over the years. The role of nurses in providing endorsement to patients regarding CR programs in hospitals is also a major indicator that is bound to improve participation rates. The study concludes that the practicing nurses have moderate to good knowledge on CRP. However, the attitude and perception of nurses towards CRP was not in appreciable level as many gaps were identified in their current practice towards different phases of CRP. That has to be addressed in the future through appropriate periodical training programs.

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Conflict of Interest

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