

Health care professionals' awareness and knowledge of cardiac rehabilitation programs among cardiovascular disease patients in Al-Madinah, Saudi Arabia.

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Abstract: Background: Cardiovascular disease (CVD) burden is devastating because of onset of illness at youngest ages, and an increase in incidence of preventable complications. Cardiac rehabilitation programs (CRP) have proven to decrease these complications. Such evidence, however, has not been established in many countries. Exploring Health care professionals' awareness and knowledge of cardiac rehabilitation programs is one step toward establishing a common understanding. **Purpose:** The purpose of the study was to examine the health care professionals' awareness and knowledge of cardiac rehabilitation programs among patients with cardiovascular diseases and after cardiac events in Al-Madinah Al-Munawarah, Saudi Arabia. **Methods:** A descriptive cross sectional design was utilized to accomplish the purpose of this study. A total of 301 health care professionals were recruited to participate in the study. Data was collected using a structured questionnaire which composed of two parts. First: Personal characteristics questions. Second: Measures health care professionals' awareness and knowledge of cardiac rehabilitation programs among cardiovascular disease patients and after cardiac events. **Results:** The mean of total knowledge and awareness of health care professional of CRP was moderately high (M=2.82; SD= .432). There were no significant differences in the demographic variables of age, gender, profession, and qualification in relation to total scores of CRP scale. The study also showed a statistical significant association between experience and training on CRP with health care professionals' awareness and knowledge of CRP among cardiovascular disease patients. **Conclusion:** Examination of health care professionals' awareness and knowledge of cardiac rehabilitation may aid in developing ways to establish and improve CRP. Therefore, the information provided in this study supports the need to develop strategies and training programs that would promote the use of cardiac rehabilitation (CR) services to improve health outcomes and reduce the risk of CVD and after cardiac events.

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Key words: Saudi Arabia, cardiac rehabilitation, cardiovascular diseases, and cardiac events.

1. Introduction:

Cardiovascular disease (CVD) is the number one cause of death globally and this trend is projected to continue into the future (Cao et al., 2009). An estimated 17.5 million people died from CVD in 2005, representing 30% of all deaths globally (World Health Organization 2007). Of these deaths, 7.6 million were due to heart attacks. Significantly, developing countries contribute to over 80% of the total CVD mortality (World Health Organization 2007). Cardiovascular diseases continue to be the number one killer worldwide (Eshah & Bond, 2009).

CVD is increasing in the developing countries. CVD burden is devastating because of onset of illness at youngest ages, and an increase in incidence of preventable complications. The excess in consumption of health services due to mortality and morbidity associated with CVD constitutes burden on the health care system (Shishani, 2010). Thus, it is essential to start implementing a comprehensive cardiovascular treatment program to manage and reduce the burden of

CVD. The Agency for Health Care Policy and Research, coupled with the National Heart, Lung and Blood Institute (AHCPR) published guidelines for cardiac rehabilitation (CR) in the USA (Wenger *et al.*, 1995). In 2000, Europe's Department of Health's National Service Framework in Europe also set standards for CR (WHO, 1964). Other Western health-care organizations—American College of Cardiology, American Heart Association, European Heart Association—have strongly Suggested guidelines for CR (Evans et al., 2006).

Cardiac rehabilitation is a valuable component of both the physical and emotional recovery of an individual after a cardiac event. Cardiac rehabilitation is defined by the American Heart Association (2006) as “coordinated, multifaceted interventions designed to optimize a cardiac patient's physical, psychological and social functioning, in addition to stabilizing, slowing, or even reversing the progression of the underlying atherosclerotic processes, thereby reducing morbidity and mortality” (Leon et al., 2005).

Cardiac rehabilitation has been found to have a remarkable effect on the major modifiable risk factors for coronary artery disease (Brubaker et al., 2002). Cardiac rehabilitation can reduce mortality and morbidity for patients with many types of cardiac disease. Furthermore, rehabilitation is helpful not only for patients who have had a myocardial infarction but also for those with stable angina or congestive heart failure (Beckie & Beckstead, 2010). Rehabilitation is also useful for patients who have undergone myocardial revascularization procedures, and heart transplant or open heart surgery (Kadda et al., 2012).

The beneficial effects of rehabilitation include a reduction in the rate of death from cardiovascular disease, improved exercise tolerance, fewer cardiac symptoms, improved lipid levels, decreased cigarette smoking, improvement in psychosocial well-being and increased likelihood of return to work (Pollard & Sutherland, 2009). Rehabilitation involves multidisciplinary team that focuses on education, individually tailored exercise, risk factor modification and the optimization of functional status and mental health. (Dafoe & Huston, 1997).

Despite the reduction rate of CVD in the developed countries, the ratio is still high in the developing countries, constituting a huge burden on individual, local, or global levels (WHO, 2003). Saudi Arabia is a developing country that is substantially affected by CVD. According to Al-Omran (2012) atherosclerotic disease (AD) is the leading cause of death in Saudi Arabia. Intensive risk reduction therapy plays a major role in reducing adverse cardiovascular outcomes in patients with AD. The level of awareness of this important fact amongst healthcare providers in managing these patients in Saudi Arabia is not currently known (Al-Omran, 2012). Furthermore, although resources for the diagnosis and treatment of AD are available in most countries, preventive approaches such as cardiac rehabilitation may not be widely implemented (Ghisi et al., 2013). However, the availability of these programs is often limited in high-income countries and much more limited in middle-income countries (Korenfeld et al., 2009). This study, **therefore**, aimed to examine the health care professionals' awareness and knowledge for cardiac rehabilitation programs among patients with cardiovascular diseases and after cardiac events in Al-Madinah Al-Munawarah, Saudi Arabia. This would emphasize the development of cardiac rehabilitation program for patients with many types of cardiac diseases and give a special attention to the well-being, quality of life and health-related parameters of cardiovascular disease patients.

2. Methods:

Study design

A descriptive, cross sectional research design was used to meet the purpose of the current study.

Population, sample and setting

The study population was consisted of all health care professionals working in clinical settings within Al-Medinah region. The study covered a convenience sample of 301 health care professionals involved with the care of cardiovascular patients and cardiac events. All subjects agreed to participate in the study after being informed about the goals of the research.

Study tool

The tool used throughout this study developed by the researcher and based on a systematic literature review. It was designed using collaborative interrater agreement and an expert assessment, which entailed that face and content validity were approached by means of peer review comprising of cardiac nurses, cardiologists, and faculty members. A pilot study revealed the need for some linguistic improvement. Furthermore, construct validity was verified by performing factor analysis. The results showed the presence of an acceptable consensus between the theoretical distribution of items and the distribution which was obtained through factor analysis. The reliability of the tool was tested by assessing the internal consistency. The internal consistency for the tool was relatively excellent (Cronbach's Alpha for the questionnaire = 0.90). The tool has two parts: Non-identifying personal data and the 54 items on a five point likert scale: Strongly agree, agree, not sure, disagree, and strongly disagree. The instrument was concerned with the following domains: Objectives of cardiac rehabilitation programs, factors determining CRP, attitudes towards CRP, positive effects of CRP, and negative effects of the absence of CRP.

Ethical considerations and data Collection Procedure

Permission for the study was granted by the institutional review board from the selected hospitals in Al-Madinah Al-Munawarah, Saudi Arabia. Once the official permission was obtained from these hospitals, the health care providers working with cardiovascular patients throughout the hospitals were invited to participate in the study. The participants were approached and informed about the purpose of the study before being asked to participate. The voluntary nature of their participation was emphasized and the steps to ensure confidentiality and anonymity were explained and implemented. Participants' consent was assured by their willingness to complete and return the questionnaires. Data were collected from January to May 2014. Completion of the instruments took approximately 10-15 minutes and no compensation was provided to the participants.

Statistical Analysis

SPSS Version 19 was used. Descriptive statistics

were used to describe the sociodemographics of the study sample. The analysis of variance (ANOVA), and (MANOVA) as applicable, were computed to test for significant differences between age, gender, experience, profession, qualification, training and type of training on CRP and total score of the whole items and each domain of the questionnaire. To establish the reliability of the scale, Cronbach's alpha was computed for the total scale and each subscale.

3. Results:

Participants' demographics

The total number of participants who completed the questionnaire was 301 with a response rate of 72%. The participants were mainly nurses. Nurses represented 80.7 % (n = 243), medicine 19.3% (n=58). The majority of the participants were female (66.4%). Regarding to the educational status, most of participants had university education, including both under and post graduate education, representing 61.5%. The majority of study sample aged between 20-30 years old with 64.1%. The average experience was 8 years with a range of 1-32 years. Generally, about 43.2% of participants attended a training activity on cardiac rehabilitation program, 71 participants had a course training representing 23.6%, and 57 had a workshop training (18.9%), where, very few of them with diploma training. **Table I** illustrates the demographic findings of participants.

Health care professionals' awareness and knowledge of cardiac rehabilitation programs

In this section the results gained from the CRP scale compared with the demographical characteristics of the study. **Table 2** demonstrates results of analysis of

variance (F) test for significance of differences in CRP questionnaire according to study variables. The analysis of results shows that there are no significant differences between most of demographical variables (age, gender, profession, and academic qualification) in relation to total scores of CRP scale. However, a significant difference exists between total scores of CRP scale and training on CRP ($f = 6.588$; $p = 0.011$), meaning that, Participants who attended the sessions of cardiac rehabilitation programs ($m = 2.89$) their knowledge of cardiac rehabilitation programs was better than their colleagues who did not attend such courses ($m = 2.78$). Other significant differences were also found between total scores of CRP scale and experience ($f = 3.69$; $p = 0.026$) study variable. Further, by using LSD test, findings were also found significant among experience categories. For example, health care professionals with more than 10 years experience are significantly differ than their counterparts with 5-10 years and less than 5 years experience, suggesting that they are more knowledgeable of cardiac rehabilitation programs. This also means that, the level of experience might be another factor influencing health care professionals' awareness and knowledge of cardiac rehabilitation programs.

Regarding the significance of differences in the domains of CRP questionnaire according to study variables. The analysis of results (MANOVA) as displayed by **Table 3**, found no significant relationships between total scores of CRP domains and age and profession variables. However, it is evident that significant relationships exist between total scores of CRP domains and gender, experience, qualification and training on CRP variables of the study sample.

Table (1): Background characteristics of the study sample (N=301).

Variable	Category	Number	Percent %
Age	20-30	193	64.1
	31- 40	59	19.6
	41-50	30	10.0
	More than 50	19	6.3
Gender	Male	101	33.6
	Female	200	66.4
Experience	Less than 5	120	39.9
	5-10	111	36.9
	More than 10	70	23.3
Profession	Medicine	58	19.3
	Nursing	243	80.7
Qualification	Diploma	116	38.5
	Bachelor	148	49.2
	Graduate studies	37	12.3
Training on CRP	Yes	130	43.2
	No	171	56.8
Type of CRP-Training	Course	71	23.6
	Diploma	2	.7
	Workshop	57	18.9

Table (2): Comparing total scores of CRP questionnaire with Demographical data (N=301).

Variables	Category	Mean	SD	F	P value
Age	20-30	2.82	.39	1.635	.181
	31-40	2.76	.43		
	41-50	2.97	.56		
	More than 50	2.91	.55		
Gender	Male	2.80	.52	3.107	.079
	Female	2.85	.38		
Experience	Less than 5	2.79	.38	3.691	.026
	5-10	2.81	.43		
	More than 10	2.94	.50		
Profession	Medicine	2.91	.55	.692	.406
	Nursing	2.81	.40		
Qualification	Diploma	2.77	.41	.546	.580
	Bachelor	2.86	.43		
	Graduate studies	2.91	.50		
Training on CRP	Yes	2.89	.40	6.588	.011
	No	2.78	.45		

* $p \leq 0.05$ **Table 3: Comparing total scores of CRP domains with Demographical data of study sample (N=301).**

Variables	Value	F	df	Error df	P value
Age	.942	1.152	15.000	787.161	.305
Gender	.960	2.400	5.000	285.000	.037
Experience	.925	2.272	10.000	570.000	.013
Profession	.975	1.487	5.000	285.000	.194
Qualification	.909	2.774	10.000	570.000	.002
CRP training	.914	5.363	5.000	285.000	.000

* $p \leq 0.05$ **Table 4: Means, Standard deviation for differences in domains of CRP scale according to study Variables (N=301).**

Variable	Category	Objectives of CRP		Factors of Establishing CRP		Definition Of CRP		Positive Effects of CRP		Negative Effects of Absence of CRP	
		\bar{x}	SD	\bar{x}	SD	\bar{x}	SD	\bar{x}	SD	\bar{x}	SD
Gender	Male	2.98	.64	2.32	.69	2.84	.67	2.94	.65	2.90	.73
	Female	3.04	.52	2.58	.60	2.84	.48	2.94	.53	2.83	.51
Experience	< 5	3.00	.48	2.56	.59	2.75	.48	2.88	.46	2.75	.51
	5-10	2.95	.60	2.38	.62	2.89	.51	2.94	.62	2.88	.61
	> 10	3.16	.62	2.57	.75	2.92	.68	3.06	.65	2.98	.67
Qualification	Diploma	2.96	.54	2.32	.66	2.85	.54	2.84	.57	2.86	.59
	Bachelor	3.05	.57	2.62	.60	2.82	.51	2.98	.54	2.82	.58
	Graduate Studies	3.06	.57	2.55	.66	2.89	.69	3.09	.62	2.93	.69
CRP Training	Yes	2.98	.48	2.63	.62	2.91	.52	3.01	.53	2.94	.52
	No	3.04	.62	2.40	.65	2.80	.56	2.89	.59	2.78	.64
Total		3.02	.56	2.50	.64	2.84	.55	2.94	.57	2.85	.59

Table 5: Comparing total scores of CRP domains with CRP training, experience, gender, and qualification variables of the study sample (N=301).

Variable	CRP Domains	Sum of Square	df	Mean square	F	P value
CRP Training	Objectives of CRP	.175	1	.175	.573	.450
	Factors of establishing CRP	4.981	1	4.981	13.469	.000
	Definition of CRP	1.033	1	1.033	3.532	.061
	Positive effects of CRP	1.298	1	1.298	4.197	.041
	Negative effects of absence CRP	2.085	1	2.085	5.999	.015
Experience	Objectives of CRP	2.432	2	1.216	3.982	.020
	Factors of establishing CRP	.411	2	.205	.555	.574
	Definition of CRP	2.009	2	1.005	3.436	.034
	Positive effects of CRP	3.243	2	1.622	5.245	.006
	Negative effects of absence CRP	2.287	2	1.143	3.290	.039
Gender	Objectives of CRP	1.184	1	1.184	3.876	.050
	Factors of establishing CRP	2.976	1	2.976	8.047	.005
	Definition of CRP	.331	1	.331	1.132	.288
	Positive effects of CRP	.018	1	.018	.058	.810
	Negative effects of absence CRP	.038	1	.038	.109	.741
Qualification	Objectives of CRP	.495	2	.248	.811	.445
	Factors of establishing CRP	3.471	2	1.736	4.694	.010
	Definition of CRP	.163	2	.082	.279	.757
	Positive effect of CRP	1.475	2	.737	2.385	.094
	Negative effect of absence CRP	.050	2	.025	.072	.930

* $p \leq 0.05$

Finally, when assessing for differences between domains of CRP questionnaire and study variables such as experience, gender, academic qualification and training on CRP. Means and standard deviations for differences in domains of CRP scale were calculated and showed the presence of differences between means in domains of CRP scale in relation to experience, gender, academic qualification and training on CRP variables. **Table 4.**

For the purpose of knowing if the differences between domains of CRP questionnaire and study demographics of experience, gender, academic qualification and CRP training are statistically significant. A multivariate analysis was performed and revealed the following results: For the variable, CRP training, statistical significant differences in the factors that affect the establishment of CRP, and the positive impact of CRP, as well as the negative impact of the absence of CRP were found. Significant differences were also found between the CRP domains and the experience variable especially in the objectives of CRP, the factors that affect the establishment of CRP domains, in addition to the positive impact of CRP and the negative impact of the absence of CRP. Moreover, statistical significant differences were found between gender variable and the objectives of CRP, and the factors that affect the establishment of CRP. Meanwhile, only the factors that affect the establishment of CRP domain found to be significantly related with the academic qualification subgroups of the study sample.

Table 5.**4. Discussion:**

In the present study, years of experience as a health care provider and training on CRP are strong indicators of greater health care professional's awareness and knowledge of CRP. These results clearly demonstrate the appeal and benefits of cardiac rehabilitation. Moreover, participants who attended the sessions of cardiac rehabilitation programs were more likely to report more knowledge and awareness of cardiac rehabilitation programs than who did not attend such courses. Furthermore, the result of this study indicated that, the level of experience might be another factor influencing health care professionals' awareness and knowledge of cardiac rehabilitation programs.

Regarding the dimensions that make up the questionnaire of the study, participants were asked to think about their perception on these areas: (1) the purpose of a CRP; (2) factors that affect the establishment of a CRP; (3) the definition of a CRP; (4) the positive impact of CRP, (5) the negative impact of the lack of a CRP. The results of this study were consistent with results of previous studies (Fernandez et al. 2008; Cao et al. 2009 7; & Ghisi et al., 2013). Where this study indicated that, physicians and nurses praised the crucial role of CRP in providing a comprehensive care to patients with CVD and after major cardiac events.

Although the health care professional have

defended the establishment of a CRP and stated that, decision-makers in their places of work are aware of the crucial role of cardiac rehabilitation program, but priorities of decision-makers consider part of the challenges to the development and implementation of a rehabilitation program. These findings are consistent with the results of Wang et al. study, which showed that health care resources were insufficient to set up rehabilitation services in China.

Health professionals provide health information to patients and family members, including directions for medication administration and food modification inside the hospital. This coincides with the significant reduction of the patient in-hospital stay as a result of advances in treatment plans (Atwal et al. 2006). Consequently, reduced patients' stay in the hospital diminishes the chances of providing health information to them i.e., risk reduction and exercise. It is, therefore, reinforces the crucial role of patient education about the disease process, health promotion, disease prevention and risk reduction, even after discharge from the hospital and this the role of the rehabilitation programs.

In this study, participants indicated that they were willing to integrate rehabilitation services at their sites of work in cooperation with other members of the health team. Moreover, health care professionals also reported that cardiac rehabilitation programs are best developed through a multidisciplinary team approach.

The majority of the participants pointed to the existence of positive thoughts of cardiac rehabilitation programs. This result is very important suggesting that there is an urgent need to take practical steps towards the establishment of cardiac rehabilitation programs in Saudi Arabia with efforts directed toward its success.

Health care professionals believe that cardiac rehabilitation program enhances and improves patient outcomes i.e., mental, social, and physical health outcomes (Pryor and Buzio, 2010). This result is well-targeted to the current and future health status, the potentials and the resources that can be used to improve and restore patient's role in the community (Spasser et al. 2006).

In this study, participants reported that cardiac rehabilitation program affects the psychological, mental and physical health aspects. It also improves the well-being, offers a guide to a better understanding of the health status of the patient, and promotes the active participation of patients' in their care after discharge. Finally, the development of rehabilitation programs, which are effective, sensitive to the needs of culture, safe and cost-effective, is a need in Saudi Arabia.

Conclusion and recommendation

In summary, findings obtained from this study highlighted a number of factors influencing health care professionals' awareness and knowledge of CRP,

including experience, training on CRP and others. Therefore, addressing these factors may increase the awareness of experts in this field to develop strategies and training programs that would promote the use of CRP in their practice, in order to achieve optimal health outcomes. Further investigation considering other factors is critical in CR service delivery models.

Implications

As the population of survivors from Cardiac events increases and ages, appropriate CR programs need to be developed to their changing needs. This will improve their overall physiological and psychological health, thus decreasing their risks of additional cardiac events. Cardiac rehabilitation programs are useful as a technique to improve patient's physiological and psychological status and decrease cardiac risk factors.

Study Limitations

Some limitation of this study should be noted. Particularly, the fact that this study was based on a convenience sample which may not be representative of health care professional working with CVD patients and after cardiac events. Another limitation is that, the cross-sectional nature of the study design places a number of limitations on the conclusion drawn. It is, therefore, difficult to make claims of causal relationships.

Acknowledgment

This research was entirely funded and supported by Deanship of Scientific Research, Taibah University, KSA (research number: 1434/4077). The author gratefully acknowledges this financial support. I would also like to express my gratitude to all participants who took their valuable time to share their experiences and thoughts in this study.

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8/15/2014