RESEARCH ARTICLE

Physiotherapy practices for patients undergoing coronary artery bypass grafting: A cross-sectional study

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Abstract

Objective: To evaluate physiotherapy practices in the rehabilitation of patients undergoing coronary artery bypass grafting.

Methods: The cross-sectional study was conducted from October 2016 to January 2017 in cardiac care units of two private and two government hospitals in Karachi, and comprised physiotherapists dealing with patients undergoing coronary artery bypass grafting. Data was collected using a modified and validated version of 'tucker q' questionnaire. Data was analysed using SPSS 21.

Results: Of the 101 physiotherapists, 60(59.4%) were females and 41(40.6%) were males. The overall work experience was 4.89+2.08 years. Of the total, 60(59.4%) physiotherapists used air suctioning in preoperative physiotherapy practices. Relaxation techniques were used by 86(85.10%) professionals and postural drainage by 85(84.20%), while breathing exercises were used by 65(64.4%) subjects in postoperative physiotherapy practices.

Conclusion: Physiotherapists were found to be more or less keeping abreast with advances made regarding managing patients undergoing cardiac artery bypass grafting.

Keywords: Coronary artery surgery, Heart surgery, Cardiac rehabilitation, Physical therapy, Breathing exercises, Postoperative care. (JPMA 71: 247; 2021)

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Introduction

Coronary artery disease (CAD) is a major health problem and attains one of the highest susceptibilities among the population with Indo-Asian origin, worldwide. Therefore, it is the foremost cause of death in the subcontinent currently.[1] The higher mortality rate is seen in the developing countries than the developed countries due to less accuracy of diagnosis, treatment and prevention. The mortality rates of CAD in Georgia and Ukraine are 43% and 45% respectively and it is 20% in Turkey. CAD is more prevalent in Iran 12.7% among Middle East countries. In Saudi Arabia, its prevalence is 5.5% and in Jordan, it is 5.9%.[2] One in five middle-aged individual may have underlying CAD in urban Pakistan. Females are at greater risk than males in Pakistan[1] whereas males have higher chances of developing CAD risk than females worldwide.[3] Increased waist circumference (WC) and body mass index (BMI) are important risk factors for CAD development, whereas the reported risk factors of CAD are obesity, diabetes, dyslipidaemia, smoking and high blood pressure.[1,4] The American College of Cardiology (ACC) regards "aging" to be an important risk factor for CAD mortality other than the five factors.[5]

There are numerous options for CAD treatment. Cardiac artery bypass grafting (CABG) has been established as a reliable option for treating patients with partial or complete blockage of coronary arteries. It has good prognosis, resulting in remission of angina and improved health status of CAD patients. In spite of its effectiveness, it is a highly invasive method, often entailing prolonged bed-rest, reduced aerobic capacity, loss of muscle strength and mass, along with physical de-conditioning. In order to reduce and prevent such damaging effects, cardiopulmonary rehabilitation is essential in the recovery and preventive course, and must be started as soon as possible.[6]

The role of physiotherapy as cardiopulmonary rehabilitation in the intensive care unit (ICU) has been recently highlighted with its importance in early mobilisation. Thus, pre- and post-operative physiotherapy is beneficial in reducing and preventing postoperative cardiopulmonary complications. The physiotherapists use various practice options for this reason with a lack of standardisation regarding the intensity, type, frequency, and duration of interventions. The physiotherapist can easily tailor treatment

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interventions in cardiopulmonary physiotherapy to the patients' need.[7-9] Literature contains utilisation of various approaches in physiotherapy practice,[7-10] but debate is still going on regarding which treatment options are best. The current study was planned to assess pre- and post-operative physiotherapy practices on patients undergoing CABG.

Subjects and Methods

The cross-sectional study was conducted from October 2016 to January 2017 in cardiac care units of two private and two government hospitals in Karachi, and comprised physiotherapists dealing with CABG patients. After getting approval from the ethics review board of Dow University of Health Sciences (DUHS), Karachi, the sample size was calculated using Open-Epi version 3.011 with a hypothesized frequency of 93% physiotherapists instructing the patients to perform breathing exercises on a regular basis after cardiac surgery, confidence limit 5%, data effect 1% and confidence level 95%.[12] The sample was raised using non-probability purposive sampling technique. Those included were physiotherapists of either gender working in the cardiothoracic departments of hospitals for more than one year. Physiotherapists not treating CABG patients were excluded. After taking informed consent, a self-administered modified validated version of 'tucker q' questionnaire was used to collect data after taking permission from the relevant authors.[9] The questionnaire comprised of closed-ended questions about treatments and techniques used in pre- and post-operative physiotherapy practice for patients undergoing CABG. Data was analysed using SPSS 21. Frequencies and percentages were used to present baseline parameters, different measures of outcomes used by the physiotherapists, assessment techniques commonly used in community hospitals and the sources of information on pre- and post-operative management of CABG patients. Mean and standard deviation were used for quantitative data.

Results

Of the 101 physiotherapists, 60(59.4%) were females and 41(40.6%) were males. The overall work experience was 4.89±2.08 years. Air suctioning was the most common practice in pre-operative physiotherapy practices 60(59.4%) (Figure-1). Relaxation techniques and postural drainage were used more often than breathing exercises in post-operative physiotherapy practices (Table; Figure-2). Peer pressure and preferences of professional colleagues influenced a physiotherapist's post-operative practice (Figure-3).

Table-1: Physiotherapists' responses for post-operative practice of cardiac patients.

Serial No.	Multiple option questions	Frequency (n=101)	Percentage (%)
1	Days of physiotherapy after surgery.		
	a. Routinely	75	74.30%
	b. If needed	25	24.70%
	c. Never	1	1.00%
2	Physiotherapy sessions per day.		
	a. One per day	18	17.80%
	b. Two per day	46	45.50%
	c. Three per day	37	36.70%
3	Physiotherapy on day 1′		
	a. No	1	1.00%
	b. Only certain cases	55	54.50%
	c. Yes to all patients	45	44.50%
4	Breathing exercises on regular basis.		
	a. No	32	31.70%
	b. Only certain cases	43	42.60%
	c. Yes to all patients	26	25.70%
6	Breaths per session during breathing exercise.		
	a. < 20	46	45.40%
	b. 20-25	49	48.60%
	c. >25	6	6.00%
7	Recommendation to performing breathing exercises at home after discharge.		
	a. Only certain patients	46	45.50%
	b. Yes to all patients	55	54.50%

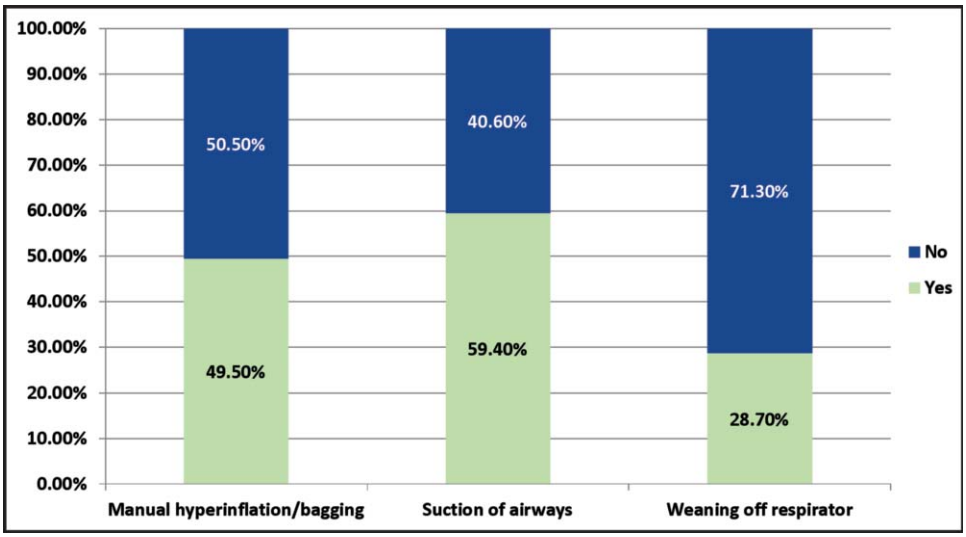

Figure-1: Physiotherapists' approach towards patients undergoing coronary artery bypass grafting (CABG) pre-operatively.

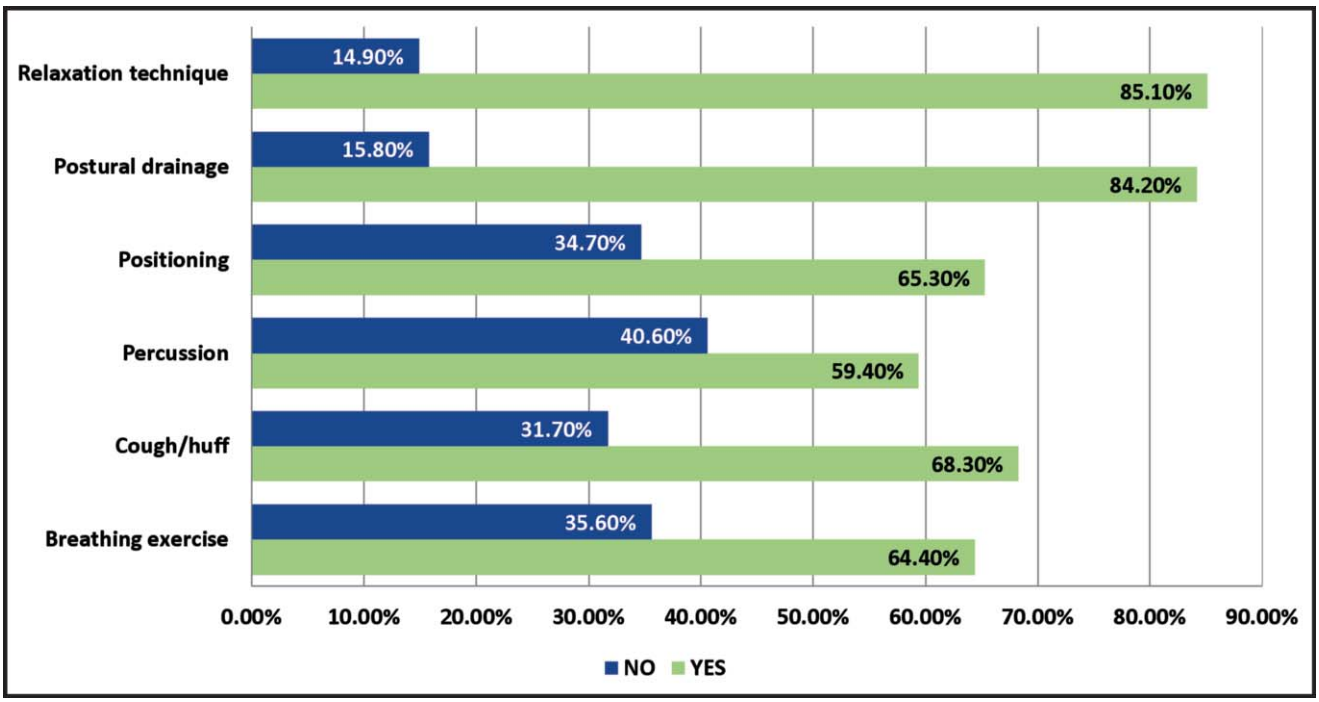

Figure-2: Physiotherapy techniques administered post-operatively.

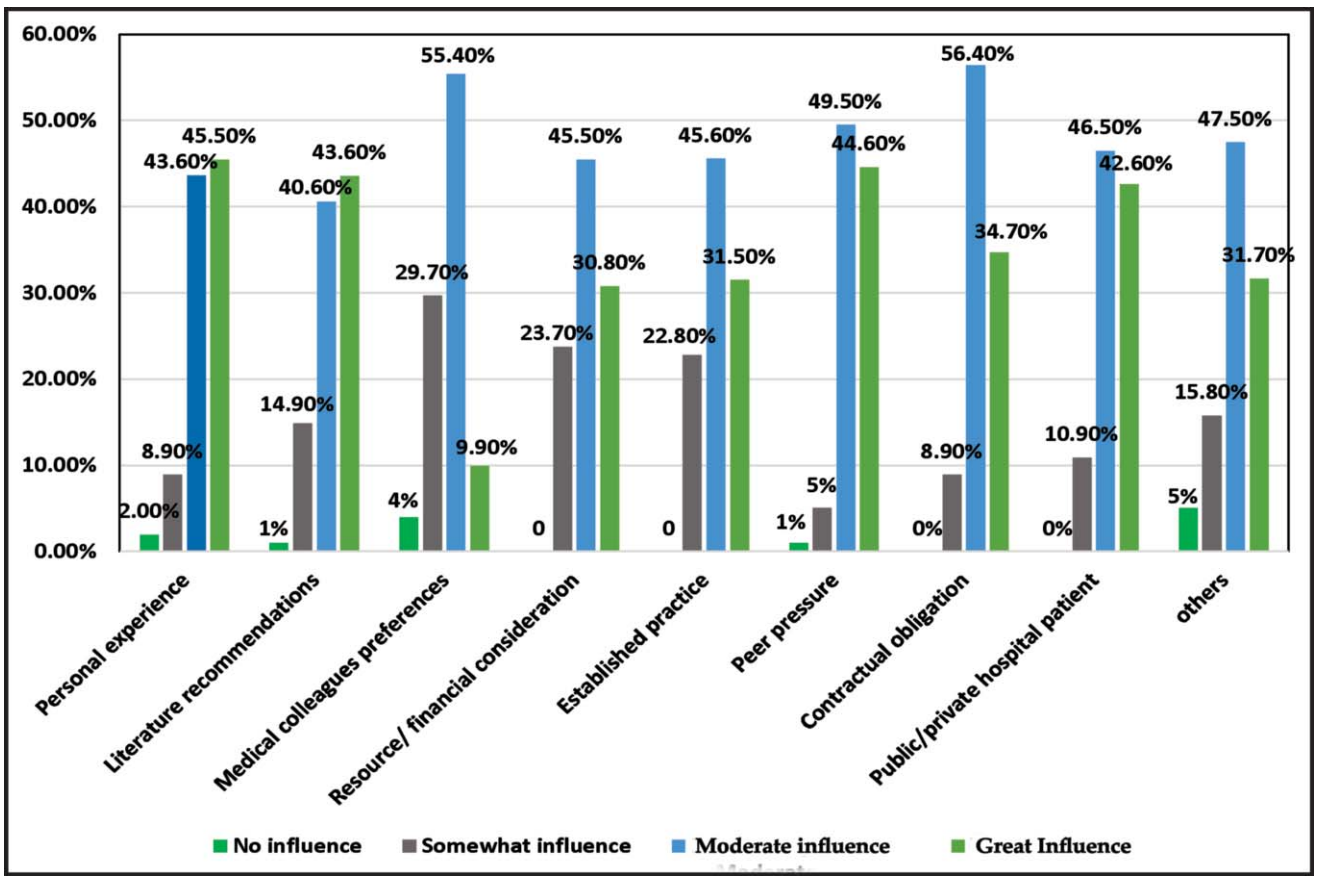

Figure-3: Physiotherapists' responses for influences on their post-operative practice.

Discussion

Physiotherapists actively participate in the rehabilitation of CABG patients and in identifying post-operative pulmonary complications,[13] but the current study found much less participation in the pre-operative phase. A study suggested that pre-operative physiotherapy decreased pneumonia and length of hospital stay.[13] The current study's findings regarding pre-operative physiotherapy might be reflective of less awareness of evidence-based physiotherapy for this purpose.

CABG is associated with post-operative reductions of functional residual capacity (FRC). Airway clearance techniques aim at preventing airway plugging to improve FRC post-surgery.[14] An observational study reported decrease in the incidence of pneumonia among quaternary care cardiac surgical population with airway suctioning.[15] The current study supported these findings in the manner of response from the physiotherapists. Literature suggests airway suctioning, hyperinflation and weaning that may result in increased lung compliance in patients. Their clinical implication is still unclear.[16] In the current study all physiotherapists showed positive response to airway suctioning, hyperinflation/bagging and weaning off respirator for patients post-CABG with majority opting for airway suctioning.

Mostly, physiotherapists treat patients routinely following heart surgery with one to three sessions per day,[17] suggesting different selections of sessions' number and days. A prospective cross-sectional study found all physiotherapists offering one to three treatment sessions on post-operative day 1 for all patients undergoing CABG.[17] In contrast, the current study showed that half of the physiotherapists provided treatment to only certain patients and half to all patients in ICU on post-operative day 1. The sample size of current study was comparatively larger, and the results might be due to lack of awareness or weak decision-making of physiotherapists. Another cross-sectional study found that Canadian physiotherapists recommended provision of cardiorespiratory treatment on post-operative day 1.[18] The study survey was done over the telephone, and there might have been limited understanding. The current study was done face-to-face.

Breathing exercises, postural drainage and relaxation techniques are the most suitable choices of treatment provided to patients on the first four post-operative days,[9] whereas different modes of these interventions are used on the basis of patients' needs. Westerdel et al in 2015 collected 29 Swedish physiotherapists' responses in a cross-sectional study, and showed that all the physiotherapists instructed breathing post-operatively. All physiotherapists reported frequency and duration of the exercises which varied from 4 to 30 breaths hourly during the daytime on the first post-operative day.[9] The current study suggested that half of the physiotherapists instructed all their patients to breathe 20-25 breaths per session, and the other half instructed less than 20 breaths per session on a regular basis. Moreover, findings suggest that more than half of the physiotherapists recommended breathing exercises with device for home programme to certain patients in the post-operative phase.

A study used ventilator response as outcome measure for peak oxygen uptake in patients suffering with cardiac disease before and after completion of 8-week cardiac rehabilitation. It recommended the measure.[19]

To the best of our knowledge, the current study is the first to assess practice in physiotherapy outcome measures for patients undergoing CABG, and has given additional results for outcome measures used by the physiotherapists.

The current study is limited to the current practice for patients undergoing CABG in Karachi only. Its findings cannot be generalised. The questionnaire was self-reported and there is a possibility of respondent's wrong understanding to the question or misconception regarding their practice.

Conclusion

The current physiotherapy practices in patients undergoing CABG were found to be relatively updated with the available evidence on their expected role.

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Conflict of Interest: None.

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