DOI 10.47176/sjmshm.5.2.1

Original Article

SRPH

SJMSHM, 2023; 5(2): 1-8

Effect of Transitional Care Program on the Readmission Rate of Patients Undergoing Coronary Artery Bypass Graft Surgery: A Randomized Clinical Trial

Mehrnaz Khishvand[1], Maryam Esmaeili[2], Hamid Haghani[3] and Khatereh Seylani[4*]

[1,3,4] School of Nursing and Midwifery, Tehran University of Medical Sciences, Tehran, Iran.
[2]Faculty of Management & Medical Information, Iran University of Medical Sciences, Tehran, Iran.

***Corresponding Author:**
Seylanik@tums.ac.ir

Received: 22 March, 2023
Accepted: 12 May, 2022
Published: 25 June, 2022

ABSTRACT

Aim: This study aimed to determine the effect of transitional care program on the readmission rate of patients after CABG (Coronary Artery Bypass Graft). Design: A randomized clinical trial. Methods: 80 patients undergoing CABG surgery were recruited by convenience sampling and randomly assigned into two groups using block randomization. The intervention group received transitional care plan, while the control group received only the routine hospital discharge care. Thirty days after discharge readmission rate, unplanned re-visit and type of postoperative complications were compared between groups. Results: The transitional care program reduced the readmission rate and unplanned re-visit in the intervention group by 5% compared to the control group, although not statistically significant (P= 0.576 and P = 0.633 respectively). There was a significant difference between two groups in terms of the type of complications (P = 0.016). To realize the ideal goals of transitional care, a multidisciplinary nurse-lead team must provide transitional care.

Keywords: Transitional care, Readmission, Coronary artery bypass graft surgery

Introduction

Coronary artery bypass graft (CABG) surgery is one of the most common treatments for patients with coronary artery disease [1]. In Iran, according to the report of Tehran Heart Center, about 80% of adult cardiac surgeries are dedicated to CABG surgery [2]. One of the most common problems after heart surgery, including CABG, is the need for readmission, so that one in five patients undergoing heart surgery has unplanned readmission within the first 30 days of discharge[3]. Reducing preventable readmissions is one of the most important goals of medical centres and one of the indicators of quality care assessment [4] and failure in its reduction, is associated with consequences such as imposed financial burden on the health care system, increased risk of mortality and poor patient outcomes [5, 6].

Due to the efforts of medical systems to reduce the length of hospital stay, there is not enough time for education, planning and gaining full knowledge of patient's physical and social needs [7]. Also, if the patient is not followed up after discharge, the possibility of inappropriate health behaviours increases due to the gradual forgetting of post-discharge health recommendations [8]. Even the provision of post-discharge care by caregivers different from primary caregivers (in hospital) can lead to disruption in the continuation of care for reasons such as lack of knowledge on medical information [9]. One of the common strategies of the successful health care systems in the world is the Hospital-based transitional care interventions, which is done with the aim of continuing care during the transition of care from hospital to home [9, 10]. In fact, integrated transitional care is an effective way to bridge the care gap between hospital care in the acute phase of illness and post-discharge care, which can be effective in reducing emergency revisits and unnecessary and costly readmission by ensuring continuation of care and avoiding unwanted consequences [11, 12].

The use of expert nurses as a transitional care nurse can be one of the best choices for post-discharge follow up to identify and address care gaps and focus

Publisher: Scientific Research Publishing House (SRPH), Shirvan, Iran
http://srpub.org
Email: sjmshm@srpub.org

on key training, medication changes, and post-discharge care program [9, 13].

Background

Lee et al. [14] in their study found that patients with congestive heart failure, who used the services of transitional care clinic that included a clinical pharmacologist, a nurse and a physician after discharge, had less 7-day and 30-day readmission compared to those who did not use the clinic [14]. Verhaegh et al. [13] in a meta-analysis study showed that transitional care interventions are associated with reduced mid-term (31-180 days) and long-term (181-365 days) readmission in chronic patients. They also showed that home visits in the first 3 days of discharge, coordination of care by a nurse, and communication between the hospital and primary caregivers are factors that significantly reduce short-term readmission [13]. In a clinical trial conducted by Rezapour [15] entitled: "Application of transitional care model in patients with chronic heart failure", transitional care improved the quality of life of patients in the intervention group in all three physical, mental-emotional and socio-economic dimensions [15].

One of the effective strategies in providing transitional care is the continuation of care process using method, in the form of providing care and monitoring through information and communication technology [16]. Tele-nursing increases clinical access and reduces time and costs of access to treatment by providing clinical support, and is also a suitable tool for education, evaluation, monitoring, counselling, and tele-health, especially in chronic diseases [17, 18].

Despite the widespread use of transitional care and post-discharge follow up in developed countries, in developing countries, routine post-discharge care includes general education and pre-discharge guidance tailored to the type of disease, and with patient discharge from hospital, the process of patient care and monitoring is practically interrupted until the next visits [19].

Due to the weakness in standard follow-up care and transitional care in developing countries and the lack of legal infrastructure defined in health care systems to implement the ideal and complete form of transitional care, in this study we tried to design a modified and applicable form of transitional care (with a combination of two methods of Tele-nursing and home visits). This form of transitional care with a focus on the role of nurses and limited facilities intends to reduce patient complications after coronary artery bypass surgery, readmission or outpatient revisits. So, this study aims to investigate whether the modified form of transitional care can reduce the rate of readmission and outpatient revisits after CABG? In addition, due to the high cost of transitional care program implementation for all patients after CABG surgery, this study was performed only on patients who had high risk of readmission.

The Study

Design

This study was a randomized clinical trial with a parallel-group design, including intervention and control groups guided by the CONSORT checklist (Figure 1). Consolidated Standards of Reporting Trials (CONSORT) checklist was applied as the reporting guideline for this study.

Method

This study was conducted on patients undergoing coronary artery bypass surgery admitted to two hospitals affiliated to Tehran University of Medical Sciences. All selected patients met the inclusion criteria and signed the informed consent to participate in the study. Sampling started in October 2018 and continued until October 2019. Participants were selected by convenience sampling method and were randomly assigned to intervention and control groups using random blocks of four. Inclusion criteria were; obtaining a score of higher than one in the 30-day readmission score, living in Tehran or its suburbs during the first month of discharge to enable home visit and access, ability to use smart phones and internet messengers by patient or his / her home caregiver in order to maintain communication and tele-monitoring of the patient, not having advanced diseases of vital organs (stroke, liver cirrhosis, untreated cancer and undergoing chemotherapy, etc.), disability (deafness or blindness, paralysis, etc.), mental illness (schizophrenia, psychosis, severe depression, etc.) and the type of surgery with a cardiopulmonary bypass pump according to the patient's self-report and medical records.

Exclusion criteria included unwillingness to continue with the study and disconnect from the researcher, change of residence from Tehran and its suburbs before the end of the one-month period after discharge, and prolongation of patient's hospital stay in the cardiac surgery or ICU for more than ten days after surgery for any reason (direct or indirect complications of heart surgery). To determine the required sample size at a significance level of 0.05 and test power 80%, assuming that the transitional care program reduces the readmission rate of patients after coronary artery bypass surgery by 20% (i.e. lower it to 5%) in order to be statistically significant, the required sample size was estimated to be 40 people in each group with the desired formula.

The instruments used in this study included: 1) Espinoza readmission risk assessment tool [5], in which obtaining a score of 1 or higher was one of the inclusion criteria. This tool contained items such as

[DOI: 10.47176/sjmshm.5.2.1]

diabetes, preoperative haematocrit of less than or equal to 35%, the highest serum glycaemic index of greater than or equal to 200, the presence of atrial fibrillation rhythm after surgery and heart surgery without cardiopulmonary pump (1 point each), and the time of connection to the cardiopulmonary pump during surgery for less than 100 minutes (1 point) and for equal to or more than100 minutes (2 points). 2) Demographic and clinical characteristics questionnaire that included questions about age, sex, marital status, number of children, education, employment status, income status, health insurance status, height and weight and body mass index, disease status, etc. It was completed by researcher by asking patient and patient's record 3) Patient monitoring checklist, which included items such as vital signs, weight, condition of organs in terms of edema, condition of incisions, adherence to educational tips such as the use of incentive spirometer and so on, the presence of complications during activity, care of surgical incisions, diet and bowel movement, medication intake, sleep and rest status, and depression symptoms. It was completed by the researcher during home visits. 4) Form of patient monitoring at home visits, which included items such as vital signs and blood sugar, patient weight, shortness of breath and the presence / absence of abnormal respiratory sounds, edema of the limbs and incisions, use of assisting devices, activity and rest status, the presence / absence of complications during rest and activity, mood status and adherence to the instructions given about diet, assisting devices and sitting and sleeping position, medication intake and the need for referral to a primary care specialist or other specialists. The questionnaires were completed by the researcher during home visits.

The validity of these questionnaires was measured and approved by face and content validity using the opinion and assistance of ten faculty members of the School of Nursing and Midwifery. The reliability of the final version of patient monitoring checklist was assessed through interrater reliability coefficient which was higher than 0.8. The agreement was reached between the two examiners on all items of the monitoring checklist during the home visits of ten patients, which was above 0.9.

After explaining the study objectives and obtaining informed oral and written consent, the samples in the control group went through the usual process of discharge from the hospital and the researcher completed only the demographic characteristics questionnaire by asking them the questions and also checking their medical notes. In the intervention group, the researcher (who was in contact with the patient and care team from the beginning of the patient's transfer to the postoperative ward and also was aware of the care process, discharge and post-discharge clinic visits) provided a thorough explanation of how to communicate after discharge and how to complete and send the follow-up checklist by the patient or his/her caregiver at home. After discharge, the patient / caregiver completed the follow-up checklist every night for the first week, and twice a week from the second to the fourth week and sent it to the researcher via WhatsApp. If the researcher saw an abnormal or suspicious case in the form sent by the patient / caregiver, she contacted the patient and provided the necessary instructions or solve the problem according to the patient's needs. If there was an acute and serious problem, the patient was asked to immediately attend the hospital emergency department. Also, two home visits were carried out (one seventh to tenth days after discharge and the other one two weeks after the first one with prior coordination with the patient). In each session, the patient was monitored at home by a nurse in terms of glycaemic and hemodynamic indicators and the general condition using the patient monitoring form, the required explanations were provided to the patient and if necessary the patient was referred to the source hospital or specialists such as psychologist, endocrinologist, and patient nutritionist for guidance. During the first thirty days of discharge, data on readmission, unplanned revisits to the source hospital or other centres (other than the visits scheduled by the source hospital), postoperative complications and monitoring were collected and recorded. Data analysis using the computer program Statistical Packages for Social Sciences (SPSS) version 20 with considering the significance level $\alpha = 0.05$ was done.

Results

The results of Chi-square, Fisher's exact test and independent t-tests showed no statistically significant difference between the control and intervention groups in terms of demographic characteristics, underlying factors and diseases, and variables related to Espinoza readmission risk scale (Tables 1 and 2 and 3).

Information on readmission, revisit without admission and type of complications in patients of both groups can be seen in Tables 4 and 5. In the intervention group, both readmission and revisit without admission were 5% less than the control group, however, the difference between the two groups was not statistically significant ($P > 0.05$) (Table 4).

[DOI: 10.47176/sjmshm.5.2.1]

Table 1
Demographic characteristics

Variable	Group	Intervention		Control		Test result
		Frequency	Percentage	Frequency	Percentage	
Gander	Female	8	20	9	22.5	P=0.785
	Male	32	80	31	77.5	
Age (mean ±SD)		60.42 9 ± 98		57.97 8 ± 51		P=0.241
Marital status	Single/widow	2	5	2	5	P=0.244
	Married	38	95	38	95	
Level of education	Illiterate	4	10	10	25	
	Under diploma/diploma	31	77.5	25	62.5	P=0.299
	University	5	12.5	5	12.5	
Body mass index (mean ±SD)		26.58 ± 3.29		26.11 ± 3.56		P=0.540
Employment status	Unemployed	2	5	0	0	P=0.713
	Employed/housekeeper	25	62.5	28	70	
	Retired	13	32.5	12	30	
Income level	Adequate	24	60	24	60	P=0.99
	Inadequate	16	40	16	40	
Type of health insurance	None	1	2.5	2	5	
	Social security	25	62.5	22	55	P=0.158
	Others	14	35	16	40	

Table 2
Having history and underlying factors

Variable/Group	Intervention		Control		Test result
	Frequency	Percentage	Frequency	Percentage	
Diabetes	15	37.5	16	40	P=0.818
Hyperlipidaemia	26	65	18	45	P=0.72
Metabolic syndrome	18	45	12	30	P=0.166
High blood pressure	23	57.5	20	50	P=0.501
Smoking	13	32.5	12	30	P=0.809
opium abuse	10	25	14	35	P=0.329
Chronic lung disease	2	5	3	7.5	P=0.99
Family history of heart disease	12	30	13	32.5	P=0.809
Chronic kidney disease	6	15	8	20	P=0.556
Chronic need for dialysis	0	0	2	5	P=0.494

Table 3
Variables related to the readmission risk scale

Variable	Group	Intervention		Control		Test result
		Frequency	Percentage	Frequency	Percentage	
Af rhythm post-surgery	Positive	6	15	11	27.5	P=0.172
	Negative	34	85	29	72.5	
Blood sugar above 200	Positive	12	30	18	45	P=0.168
	Negative	28	70	22	55	
Haematocrit less than	Positive	21	52.5	25	62.5	P=0.198
34.9% before surgery	Negative	19	47.5	15	37.5	
Espinoza readmission scale score (mean and standard deviation)		2.32 ± 1.28		2.67 ± 1.22		P=0.217

Table 4
Distribution of readmission and re-visit rate in the two groups

Variable/Group	Intervention		Control		Result of Chi-square test
	Frequency	Percentage	Frequency	Percentage	
Readmission	7	17.5	9	22.5	P=0.576
Revisit rate	12	30	14	35	P=0.633

[DOI: 10.47176/sjmshm.5.2.1]

Table 5
Frequency distribution of complications leading to readmission or revisit without admission in both groups

	Intervention		Control	
Type of complication/Group	**Frequency**	**Percentage**	**Frequency**	**Percentage**
No complication	20	50	20	50
Infection of sternal surgical incision	9	22.5	4	10
Surgical incision infection of the limb	4	10	2	5
Pleural effusion	5	12.5	4	10
Pneumonia	0	0	1	2.5
Shortness of breath	0	0	2	5
Other (chest pain, depression, palpitations, lower extremity edema, hypertensive crisis, hyperglycaemia, severe bradycardia leading to implantation of a pacemaker)	2	5	7	17.5
Results of Fisher's exact test			P=0.016	

Regarding the type of complications leading to revisit or readmission, the results were as follows: In each group, 20 patients (50%), no complication was reported during the first thirty days of discharge. Infection of the sternal surgical site occurred in 22.5% of the subjects in the intervention group and in 10% of the subjects in the control group. Infection of the incision site also occurred in 10% of subjects in the intervention group and 5% of subjects in the control group. Pleural effusion was detected in 12.5% of subjects in the intervention group and 10% of subjects in the control group. Also, 2.5% of subjects in the control group (one person) developed pneumonia, but this complication did not occur in the intervention group. Two patients (5%) in the control group complained about shortness of breath, which was not reported in the intervention group, and also 5% of subjects in the intervention group and 17.5% in the control group reported other complications, including chest pain, depression, palpitations, lower extremity edema, hypertensive crisis, hyperglycaemia, and severe bradycardia leading to implantation of pacemaker. The difference between the control and intervention groups was significant in terms of the type of complications leading to hospital readmission or unplanned revisit (P = 0.016) (Table 5).

Discussion

In the present study, the effect of transitional care program on the readmission rate of patients undergoing CABG surgery was investigated. According to the results of Chi-square test, there was no statistically significant difference between the two groups of intervention and control in terms of readmission rate during the first 30 days of discharge (P = 0.576). In the study of Lee et al. [14], the rate of readmission within 30 days in the group receiving care in the transitional care clinic was 11.32% and in the control group was 31.31%, and there was a statistically significant difference between the two groups in terms of 30-day readmission rate [14]. In the study of Lee et al. [14] the group that did not receive transitional care had three times more 30-day readmission rate than the group that received it. In the present study, the control group had 5% more 30-day readmission rate then the intervention group. It seems that in the present study, the reason for the lack of statistically significance difference between the two groups in terms of 30-day readmission is the small sample size. In the study of Hall et al. [20] the "follow your heart" program caused a significant difference in the readmission rate between the two groups (p = 0.015). The program reduced 30-day readmission rate after CABG surgery to 3.85% in the intervention group, while it was 11.54% in the control group (p = 0.023), [20]. The transitional care program used in the Hall et al., study was a comprehensive program that was planned, organized and implemented by the hospital. This difference in results can be explained by the lack of researcher's authority in the present study and also lack of cooperation between the nurses and physicians at the hospital under study. In a study by Robertson et al. [21], a multidimensional transitional care intervention was performed on patients undergoing elective cranial or spinal surgery. During the study period, 416 patients were included in the transitional care program and were equated with the control group that was not included in the program due to staffing limitations. The intervention reduced the 30-day readmission to 2.5% compared to 5.8% in the control group (P = 0.02), [21]. The strength of Robertson's study is the team working of professionals in multidimensional interventions that produced different outcomes between the two studies. In the study of Iqbal et al. (2019), which examined the effect of discharge training by nurses on the readmission rate of patients with heart failure, unplanned readmission within 30 days of discharge in the control group was 66.7% and in the intervention group was only 20%, which t was one third of the control group[22]. The type of intervention performed in the present study was wider than the study of Iqbal et al (which was limited to discharge education and

[DOI: 10.47176/sjmshm.5.2.1]

post-discharge telephone follow-up) and the rate of readmission in the intervention group was less than the rate of readmission in the study of Iqbal et al. [22]. However, in the present study, the difference between the intervention and control groups was not significant. Since heart failure is a chronic disease, it is likely that even simple educational interventions would be more effective, while patients undergoing major surgeries such as coronary artery bypass grafts are exposed to much more serious complications such as surgical site infections that in some patients may not be treated without hospitalization, intravenous antibiotics and debridement, etc. In the study of Finlayson et al. (2018) readmission within the first 28 days of discharge accrued in the control group by 25%, in the group receiving exercise program by 14%, in the group receiving nursing interventions by 10% and in the group receiving all of the above interventions by 8%. Also, the third and fourth groups had significantly lower rate of unplanned readmission [23]. The intervention performed in the present study is somewhat similar to that performed in group that received nursing interventions in the Finlayson et al's study. However, it is likely that the small sample size, the lack of cultural acceptance of samples to accept interventions such as home visits, and the lack of favourable cooperation in the present study produced different results from the above study, as 17 sample drop (42.5%) in the intervention group showed that to implement such approaches, creating a proper formal and organizational context is a vital prerequisite. In a retrospective observational study by Harrison et al. (2014), the effect of post-discharge nurse phone calls on 30-day readmission rate was investigated and the results showed significantly less readmission in patients who had received phone call follow-up (5.8%) compared to those who did not receive any phone calls (8.6%), [10]. The intervention in our study, in addition to following up the patient via internet messenger, included two sessions of home visits. In the Harrison's study, the study population included all patients who had been discharged from the hospital and did not consider patients with a specific diagnosis, such as CABG surgery. Given that the study population in this study were high-risk people in terms of readmission, their chances of readmission were essentially higher than the study population in Harrison's study.

In terms of revisit without admission, the statistical difference between the two groups was not significant according to the results of Chi-square test (30% in the intervention group and 35% in the control group). In the study of Forouzesh et al., visit to emergency department without admission was 46.3% in the intervention group and 51.7% in the control group, so there was no significant difference between the two groups in that regard [24]. In the present study, the rate of revisit without admission in both groups was much lower than the Forouzesh et al's study. In comparing the type of complications leading to readmission within 30 days of discharge in the two groups, the results of Fisher's exact test showed a significant difference between the control and intervention groups. In Sadeghi Afkham et al's study, the most common complications diagnosed in patients included pleural effusion (22.75%), deep sternal infection (11.7%), leg incision infection (9.7%), and respiratory complications (6.2%) and only few cases such as pericardial effusion, cellulite, myocardial infarction, arrhythmia, unstable angina, and so on were diagnosed [25]. In terms of types of complications, the result of present study is not consistent with the finding of Sadeghi Afkham's study. In the present study, sternal incision infection was the most common complication in the intervention group and in the control group, a combination of other complications (including chest pain, depression, palpitations, lower extremity edema, hypertensive crisis, hyperglycaemia, severe bradycardia leading to pacemaker implantation) had the highest percentage of complications. Since other complications were much less in the intervention group than in the control group, it seems that the interventions performed had an effect on reducing complications that were not directly related to the surgical procedure.

Limitations

The most important limitations in this study were the lack of trust of patient and his/her companions in giving permission for home visits, the lack of hospital obligation to introduce and approve the researcher as a reliable person to follow up the patients, and the high number of sample drops (one person in the control group due to death and seventeen people in the intervention group due to failure to send reports or disapproval for a home visit despite initial consent to participate in the study, relocation from Tehran, etc.). Also, the limitation in legal and professional authority of nurses in our country, unlike other countries, where nurses with advanced skills are allowed to make decisions based on evaluation, diagnosis and interpretation of test results and also are able to prescribe medication or refer patients to other specialists when necessary [26], had limited the role of researcher (transitional care nurse) to just monitoring symptoms and advising the patient to see a physician in case of emergency.

Conclusion

According to the findings of present study, after the implementation of transitional care, the rate of readmission and outpatient revisit in the intervention group was lower than the control group, which can have clinical significance, but the difference between

[DOI: 10.47176/sjmshm.5.2.1]

the two groups was not statistically significant. Now, with the implementation of transitional care program, the type of postoperative complications in patients with coronary artery bypass surgery in the intervention group was significantly different from patients in the control group, and the majority of postoperative complications in the control group were chest pain, depression, palpitations, edema of lower extremities, hypertensive crisis, hyperglycemia, and severe bradycardia leading to implantation of pacemaker, while the most common complication in the intervention group was surgical site infection. It seems that the transitional care program in this study moderated the underlying problems of patients in the intervention group that were not directly related to the surgical procedure. The basic form of nurse-lead transitional care that was introduced in the present study, despite its weaknesses, is practically applicable in all hospitals with the cooperation of only two nurses, but to achieve Ideal results, this care requires a multidisciplinary team including patients' surgeon.

Application of Findings

If the hospital's home care unit is activated and patients are followed up, and also post-discharge care is provided, the number of unnecessary revisits and readmissions will be reduced and, of course, more time and facilities will be designated to improve the quality of care for other patients. Also, with the transitional care that starts with the patient's admission to hospital, the quality of care improves during the hospital stay and discharge.

References

1. Nasiri M, Naboureh A, Fayazi S. The effect of an islamic praise (zikr) on postoperative anxiety of patients undergoing coronary artery bypasses graft surgery: a randomized clinical trial on iranian shia muslims. *Res Cardiovasc Med.* 2017; 6(3): 1-7.
2. Abbasi K, Karimi A, Abbasi SH, Ahmadi SH, Davoodi S, Babamahmoodi A, et al. Knowledge management in cardiac surgery: the second tehran heart center adult cardiac surgery database report. *J Tehran Unive Heart Cent.* 2012; 7(3): 111.
3. Brown JR, Parikh CR, Ross CS, Kramer RS, Magnus PC, Chaisson K, et al. Impact of perioperative acute kidney injury as a severity index for thirty-day readmission after cardiac surgery. *Ann Thoracic Surg.* 2014; 97(1): 111-117.
4. Tam DY, Fang J, Tran A, Tu JV, Ko DT, Deb S, et al. A clinical risk scoring tool to predict readmission after cardiac surgery: an ontario administrative and clinical population database study. *Can J Cardiol.* 2018; 34(12): 1655-1664.
5. Espinoza J, Camporrontondo M, Vrancic M, Piccinini F, Camou J, Benzadon M, et al. 30-day readmission score after cardiac surgery. *Clin Trial Regul Sci Cardiol.* 2016; 20: 1-5.
6. Price JD, Romeiser JL, Gnerre JM, Shroyer ALW, Rosengart TK. Risk analysis for readmission after coronary artery bypass surgery: developing a strategy to reduce readmissions. *J Am Coll Surg.* 2013; 216(3): 412-419.
7. Davies S. Transitional care for the cardiac surgery population: development of a clinical practice guideline. 2018.
8. Kermansaravi F, Navidian A, Ghaderi S. Impact of continuous care model on self-care behaviors of patients with myocardial infarction: a randomized clinical trial study. *J Birjand Univ Med Sci.* 2019; 26(2): 106-117.
9. Tsai TC, Orav EJ, Jha AK. Care fragmentation in the postdischarge period: surgical readmissions, distance of travel, and postoperative mortality. *JAMA surg.* 2015; 150(1): 59-64.
10. Harrison JD, Auerbach AD, Quinn K, Kynoch E, Mourad M. Assessing the impact of nurse post-discharge telephone calls on 30-day hospital readmission rates. *J Gen Inter Med.* 2014; 29(11): 1519-1525.
11. Morrison J, Palumbo MV, Rambur B. Reducing preventable hospitalizations with two models of transitional care. Journal of nursing scholarship: an official publication of Sigma Theta Tau International Honor Society of Nursing. 2016; 48(3): 322-329.
12. Naylor MD, Sochalski JA. Scaling up: bringing the transitional care model into the mainstream. Issue Brief (Commonw Fund). 2010; 103(11): 1-12.
13. Verhaegh KJ, MacNeil-Vroomen JL, Eslami S, Geerlings SE, de Rooij SE, Buurman BM. Transitional care interventions prevent hospital readmissions for adults with chronic illnesses. *Health Affairs.* 2014; 33(9): 1531-1539.
14. Lee J, Reyes F, Islam M, Rahman M, Ramirez M, Francois J, et al. Outcomes of a transitional care clinic to reduce heart failure readmissions at an urban academic medical center. *Int J Clin Res Trial.* 2019; 4(2).
15. Rezapour-Nasrabad R. Application of transitional care model in patients with chronic heart disease: a case-controlled intervention study. *Revista Latinoamericana de Hipertensión.* 2018; 13(3): 285.
16. Arnaert A, Ponzoni N. Reflections on a Canadian online telehealth course: going forward with telehealth nursing. *Can J Nurs Res.* 2015; 47(3): 73-76.
17. Maryah A, Mya A, Margarita L, Mika M, Lisa S. Nurses: extending care through telehealth. *J Comm Comput.* 2015; 12: 117-122.
18. Balenton N, Chiappelli F. Telenursing: bioinformation cornerstone in healthcare for the 21st Century. *Bioinform.* 2017; 13(12): 412.

[DOI: 10.47176/sjmshm.5.2.1]

19. Li S-l, Zhou S-h, Lin Y-j. The value of continuous nursing in patients after cardiac mechanical valve replacement. *J Cardiothoracic Surg.* 2020; 15(1): 1-5.
20. Hall MH, Esposito RA, Pekmezaris R, Lesser M, Moravick D, Jahn L, et al. Cardiac surgery nurse practitioner home visits prevent coronary artery bypass graft readmissions. *Ann Thoracic Surg.* 2014; 97(5): 1488-1495.
21. Robertson FC, Logsdon JL, Dasenbrock HH, Yan SC, Raftery SM, Smith TR, et al. Transitional care services: a quality and safety process improvement program in neurosurgery. *J Neurosurg.* 2018; 128(5): 1570-1577.
22. Iqbal Z, Parveen M, Parveen M, Azhar M, Bhatti Y, Ali A. Impact of nursing discharge instructions on readmission rate in heart failure patients: a comparative study. *Pakistan Heart J.* 2019; 52(2).
23. Finlayson K, Chang AM, Courtney MD, Edwards HE, Parker AW, Hamilton K, et al. Transitional care interventions reduce unplanned hospital readmissions in high-risk older adults. *BMC Health Serv Res.* 2018; 18(1): 956.
24. Forouzesh M, Sanagoo A, ghavidel A, Vakili MA, Jouybari L, Araghian Mojarad F. The effect of telenursing (telephone follow up) after discharge on readmission due to complications after coronary artery bypass graft surgery. *Nurs Midwif J.* 2017; 15(8): 584-594.
25. Sadeghi Afkham M, Ghafoori F, Mardi A, Refahi S. Factors affecting readmission in patients undergoing coronary artery bypasses surgery at tehran heart center. *J Ilam Univ Med Sci.* 2019; 26(5): 154-161.
26. Osho Y. The role of the advanced nurse practitioner. 2019; https://www.independentnurse.co.uk/blogs-article/the-role-of-the-advanced-nurse-practitioner/213167/

SJMSHM

Citation: Khishvand M, Esmaeili M, Haghani H, Seylani K. Effect of Transitional Care Program on the Readmission Rate of Patients Undergoing Coronary Artery Bypass Graft Surgery: A Randomized Clinical Trial. SJMSHM, 2023; 5(1): 1-8.

https://doi.org/10.47176/sjmshm.5.2.1

[DOI: 10.47176/sjmshm.5.2.1]