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Research Article/Araştırma Makalesi

The Impact of Nursing Care Provided to Patients Undergoing Coronary Artery Bypass Grafting on Discharge Learning Needs, Meeting of These Needs, Perception of Recovery, Coping-Adaptation Level, and Quality of Life

Koroner Arter Baypas Greftli Hastalara Verilen Hemşirelik Bakımının Taburculuk Öğrenim Gereksinimleri ile Bu Gereksinimlerin Karşılanması, İyileşme Algısı, Başetme-Uyum Düzeyi ve Yaşam Kalitesi Üzerine Etkisi

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ABSTRACT

Background/ Objective: Globally, coronary artery bypass graft surgery is increasing in parallel with the increase in coronary artery disease, and home care management of patients after this major surgery is becoming more important. To examine the impact of nursing care provided to patients undergoing coronary artery bypass graft surgery on discharge learning needs, meeting these needs, perception of recovery, coping and adaptation levels, and quality of life.

Material and Methods: The study was conducted using a quasi-experimental, prospective, and longitudinal research design. The study sample consisted of 80 patients, 40 intervention and 40 control. Data were collected in the cardiovascular surgery clinics and outpatient clinics of a university and a training and research hospital in Antalya Province. Data were collected via face-to-face interviews, including initial preoperative measurements and repeated measurements at the first and third months. The control group received routine clinical care.

Results: In the intervention group patients undergoing coronary artery bypass graft surgery, the level of discharge learning needs met, perception of recovery, coping and adaptation levels, and quality of life levels were significantly higher than in the control group across all subscales and measurements ($p<0.05$). The highest priority for discharge learning needs was reported in the "Activities of living" subscale in both the intervention and control groups. At discharge, in all measurements at one and three months, intervention group patients reported their learning needs as "fully met", while patients receiving routine clinical care reported their needs as "neither more nor less met".

Conclusion: Nursing care provided to patients undergoing coronary artery bypass graft surgery was found to improve the level of discharge learning needs met, perception of recovery, coping and adaptation levels, and quality of life.

Keywords: Adaptation; coping skills; coronary artery bypass grafting; nursing care; quality of life.

ÖZ

Giriş/Amaç: Küresel ölçekte, koroner arter hastalığı artışına paralel olarak koroner arter baypas greft cerrahisi de giderek artmaktadır ve bu majör cerrahi sonrası hastaların evde bakım yönetimi çok daha önem kazanmaktadır. Koroner arter baypas greft cerrahisi uygulanan hastalara verilen hemşirelik bakımının; taburculuk öğrenim gereksinimleri ile bu gereksinimlerin karşılanması, iyileşme algısı, başetme-uyum düzeyi ve yaşam kalitesine etkisinin incelenmesidir.

Gereç ve Yöntemler: Araştırma; yarı-deneysel, prospektif ve longitidunal araştırma tasarımına uygun yürütülmüştür. Koroner arter baypas greft cerrahisi geçiren hastalara verilen hemşirelik bakımının etkisi deney ve kontrol grubu verileri karşılaştırılarak sınanmıştır. Araştırma örneklemini 40 girişim ve 40 kontrol olmak üzere 80 hasta oluşturmuştur. Veriler Antalya İli'ndeki bir üniversite ve bir eğitim araştırma hastanesinde kalp-damar cerrahisi klinik ve polikliniklerinde toplanmıştır. Veriler yüz yüze görüşme yöntemiyle; ameliyat öncesi ilk ölçümler, birinci ay ve üçüncü ay tekrarlı ölçümlerde toplanmıştır. Kontrol grubu, klinik rutin bakım almıştır.

Bulgular: Koroner arter baypas greft cerrahisi geçiren girişim grubu hastalarda, taburculuktaki öğrenim gereksinimlerinin karşılanma düzeyi, iyileşme algısı, başetme-uyum düzeyi ve yaşam kalitesi düzeylerinin tüm alt boyutlarda ve ölçümlerde kontrol grubundan anlamlı şekilde yüksek olduğu saptanmıştır ($p<0.05$). Girişim ve kontrol grubu hastalarda taburculuktaki öğrenim gereksinimlerindeki önceliğin en yüksek "yaşam aktiviteleri" alt boyutunda bildirildiği bulunmuştur. Taburculukta, birinci ve üçüncü aydaki tüm ölçümlerde girişim grubu hastalar öğrenim gereksinimlerini "tamamen karşılandı" olarak belirtirken, klinik rutin bakım alan hastalar ise "ne az ne çok karşılandı" olarak belirtmiştir.

Sonuç: Koroner arter baypas greft cerrahisi geçiren hastalara verilen hemşirelik bakımının; taburculuktaki öğrenim gereksinimlerinin karşılanma düzeyi, iyileşme algısı, başetme-uyum düzeyi ve yaşam kalitesini arttırdığı görülmüştür.

Anahtar Kelimeler: Başa çıkma yöntemleri; hemşirelik bakımı; koroner arter baypas greftleme; uyum; yaşam kalitesi.

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1. Introduction

According to the World Health Organization data, cardiovascular diseases are the leading cause of death among men and women in both developed and developing countries, and they are expected to remain the number one cause of death for a long time (https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases, Accessed on: 06.08.2024). Within the causes of death defined worldwide and in Türkiye, coronary artery disease (CAD) and hypertension hold the largest share (ESC, 2021; Lawton et al., 2022; WHO, 2023). In the report published by the Ministry of Health of the Republic of Türkiye for the "Türkiye Cardiovascular Diseases Prevention and Control Program (2021-2026)", according to the 2018 cause of death statistics, circulatory system diseases are reported as the leading disease group causing death in Türkiye with 38.5%, and it is seen that 39.8% of those who died from ischemic heart disease, 22.3% from cerebrovascular diseases, and 24.5% from other heart diseases (https://hsgm.saglik.gov.tr/depo/birimler/kronik-hastaliklar-ve-yasli-sagligi-db/Dokumanlar/Kitaplar/KalpDamarEylemPlani_2021-2026.pdf, Accessed on: 24.08.2025). Coronary artery bypass grafting (CABG) surgery is one of the standard treatment methods in myocardial revascularization for atherosclerotic vascular diseases. The aim of CABG surgery is to improve symptoms and prolong survival (Durmaz Eder and Kankaya, 2025; Lawton et al., 2022). The technique performed with cardiopulmonary bypass in CABG is the standard technique and provides similar results to off-pump procedures (Yıldırım et al., 2022). However, CABG performed with cardiopulmonary bypass is a major surgical intervention that directly affects vital functions. It is important to reduce the risks and costs associated with surgery and anesthesia, return the patient to the desired functional level as soon as possible, and improve the quality of perioperative care (Durmaz Eder and Kankaya, 2025). In postoperative home care, the aim is to reorganize homeostatic balance, maintain cardiovascular function, and improve quality of life for rapid recovery (Aydın and Gürsoy, 2019; Boggess et al., 2024; Çayırtepe, Esatoğlu, Aral, 2020; Kaya and Dal Yılmaz, 2024; Park et al., 2025; Totur Dikmen and Yavuz van Giersbergen, 2021). For all these reasons, all healthcare professionals involved in treatment and care, especially nurses, aim to meet the care needs of patients undergoing CABG during their hospital stay, prepare patients and their relatives for home care processes, and thus help patients to adapt to their lives as quickly as possible, which is a very important part of this care (Altınbas and Yavuz van Giersbergen, 2021; Çatal, 2025). However, CABG surgery, as a major surgical intervention, is an important factor affecting individuals' adaptation levels and disrupts a person's bio-psycho-social balance and adaptation as a physiological and psychosocial stressor (Çatal and Dicle, 2011; Kan, 2009; Kendirkıran and Batmaz, 2020; Köseoğlu Örnek et al., 2022; Redeker, 1992; Toit, 2003; Tung, Hunter, Wei, 2008). There is increasing interest in research examining quality of life in patients undergoing CABG, but patient outcomes are still not at the desired level (Çayırtepe, Esatoğlu, Aral, 2020; Yavuz, 2019; Yılmaz and Çifçi, 2011). Additionally, there is a need to meet the learning needs of these patients and to define the stimuli/stressors and coping behaviors. CABG surgery is a significant factor affecting individuals' adaptation levels; it disrupts a person's bio-psycho-social balance and harmony as a physiological and psychosocial stressor. However, it requires a personalized assessment for each individual. This study aims to investigate the impact of nursing care provided to patients after CABG surgery on their discharge learning needs, the level of meeting of these needs, perception of recovery, coping-adaptation level, and quality of life. The theoretical framework for this research was formed by Roy's Adaptation Model. Because the central concept in the model is adaptation, and in this study, CABG surgery is a focal stimulus affecting individuals' adaptation levels. According to the Roy Adaptation Model, effective adaptation behaviors in the areas of physiology, self-concept, role function, and interdependence are achieved through coping and control systems. Knowledge and learning processes are crucial for an individual's cognitive-emotional coping behaviors (Roy, 2009). Considering the purpose, variables, intervention and measurement tools of this research, it is seen that it overlaps with the concepts of the Roy Adaptation Model. In this context, this research, is unique in that it allows for the simultaneous testing of many aspects of the Roy Adaptation Model.

2. Methods

Type of Research

This research was conducted according to a quasi-experimental, prospective, and longitudinal research design.

Research Hypotheses

•H1-1: There are differences between the intervention group receiving nursing care after CABG surgery and the control group receiving routine clinical care in terms of the importance attributed to learning needs.

•H1-2: There are differences between the intervention group receiving nursing care after CABG surgery and the control group receiving routine clinical care in terms of the level of meeting of learning needs.

•H1-3: There are differences between the intervention group receiving nursing care after CABG surgery and the control group receiving routine clinical care in terms of the levels of perception of recovery.

•H1-4: There are differences between the intervention group receiving nursing care after CABG surgery and the control group receiving routine clinical care in terms of the levels of coping-adaptation.

•H1-5: There are differences between the intervention group receiving nursing care after CABG surgery and the control group receiving routine clinical care in terms of the levels of quality of life.

Population and Sample of the Research

The population of the research consisted of patients who underwent CABG surgery in the cardiovascular surgery clinic of a university and a training research hospital in Antalya. The sample size was calculated using NCCS-PASS and MINITAB programs at a significance level of 0.20 and 0.05, considering a 95% confidence interval; 40 patients were selected for the intervention group and 40 for the control group, totaling 80 patients. The sample criteria and distributions of CABG patients included in the research are presented in Figure 1.

Data Collection

In the study, to prevent clinical contamination and control confounding factors (that may change the actual effect of the intervention, such as dissemination of the content of the training booklet, monitoring of the intervention content by the clinical team, changes in clinical practice afterward, etc.), data for the control group were collected first, followed by data for the intervention group. The nursing care applied to the intervention group included discharge education, a booklet titled “Living in Harmony with Your Renewed Heart and Vessels”, intensive care visits, telephone counseling, and follow-up. The steps of the data collection process according to the research design are detailed in Figure 2.

Data Collection Tools

The following tools were used for data collection:

Form I: Sociodemographic and Clinical Characteristics Form: This form includes sociodemographic characteristics such as age, gender, marital status, education level, as well as items related to health history, data during hospitalization, and surgery-specific data.

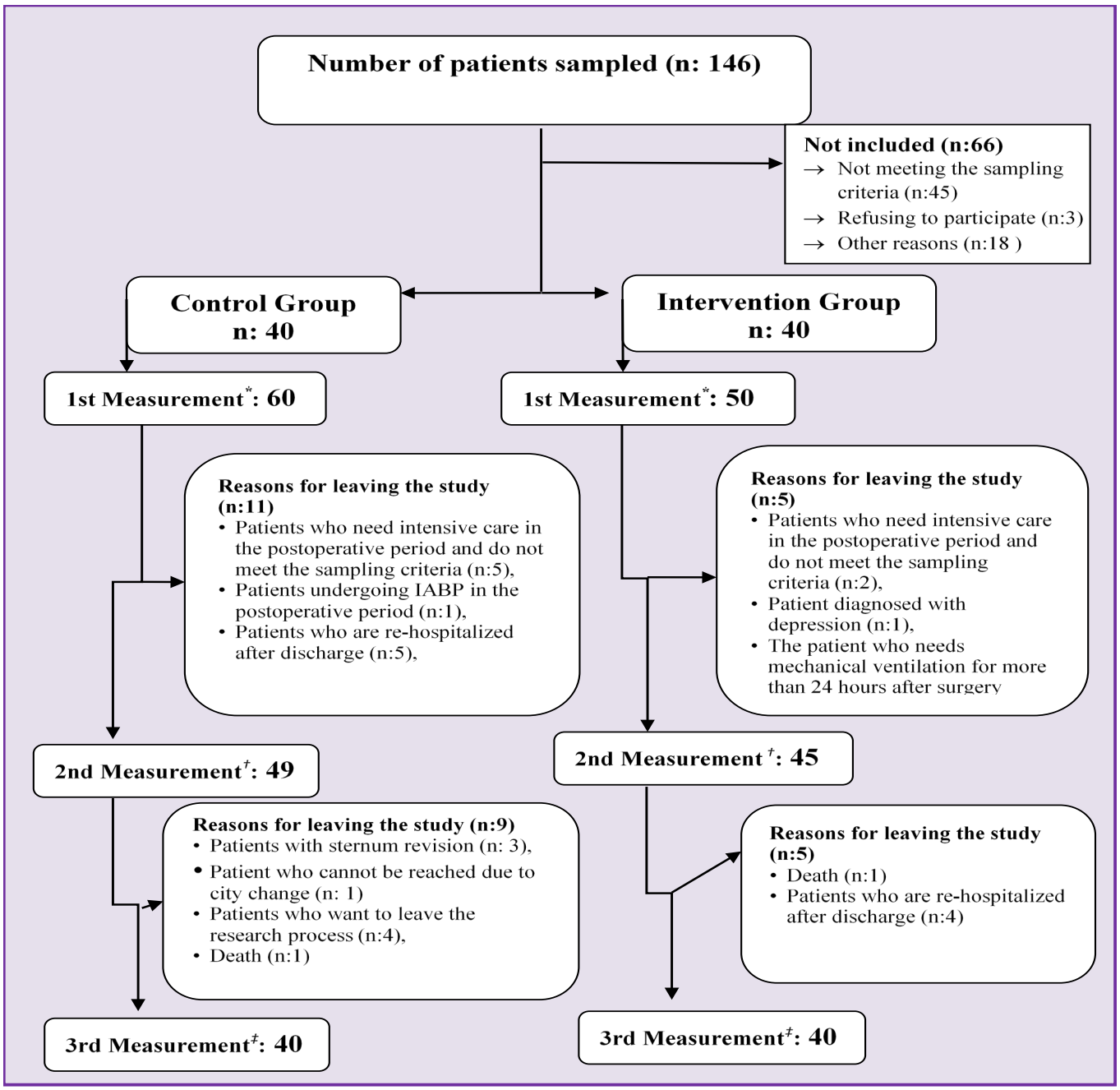
Form II: Perception of Recovery and Postoperative Monitoring Information Form: This form assesses patients’ perceptions of recovery using a scale developed by Younght & Casper in 1993, where patients evaluate their recovery perception on a scale of 0-10 (0=Not Recovered, 10=Fully Recovered) (Kan, 2007). It also includes follow-up items such as readmission status, reasons, pain at the incision site, and presence of discharge.

Patient Learning Needs Scale (PLNS): PLNS, developed by Bubela et al. in 1990, consists of 50 items and 7 subscales to determine patients’ learning needs at discharge. The scale items are evaluated using a Likert-type scale ranging from “1=not important” to “5=extremely important.” The “Needs Met Score-NMS” section of the scale determines whether information was provided before discharge and the status of fulfilling those needs. Patients evaluate the information provided for each scale item on a Likert-type scale from “1=not suitable at all” to “5=completely suitable”, with an option to indicate “0=no information provided to meet my needs.” The scale and subscale scores are interpreted by dividing the total scale and all subscale item counts, yielding importance levels and fulfillment levels between 1 and 5. The validity and reliability of the Turkish version of the scale were established by Çatal and Dicle (2008), with a Cronbach’s alpha of 0.93 for the total scale and between 0.57-0.83 for the subscales. The Cronbach alpha value calculated for this study was 0.81 for PLNS-IS and 0.99 for PLNS-NMS.

Coping and Adaptation Process Scale (CAPS): CAPS, developed by Callista Roy (2004), is a scale that allows for the identification of individuals’ coping and adaptation strategies in critical and challenging situations, based on the Roy Adaptation Model (Roy, 2004). CAPS consists of 47 items and five subscales, with items rated on a Likert-type scale from 1=never to 4=always (Roy, 2004). The original language of CAPS is English, and it has been adapted into Thai, Spanish, and Japanese. The validity and reliability of CAPS in Turkey were tested by Çatal and Dicle, with a Cronbach’s alpha of 0.82 for the total scale and between 0.65-0.77 for the subscales. The Cronbach alpha value calculated for this study was 0.83 for CAPS.

Short Form-36 (SF-36) Quality of Life Scale: The Short Form-36 Quality of Life Scale is the most widely used quality of life scale with a generic criterion (not disease-specific) feature that provides broad measurements.

The scale was developed by Ware in 1992. The SF-36 is a self-assessment scale composed of 36 questions and eight subcomponents. The Cronbach's alpha values for the subcomponents of the original form range from 0.62 to 0.94 (Ware, 1992). The Turkish adaptation of the SF-36 was conducted by Pınar (1995; 1996) and Koçyiğit et al. (Koçyiğit, Aydemir, Ölmez, 1999). Various measurement tools are used to assess quality of life in this patient group, but SF-36 is reported to be one of the most suitable generic tools (Çayırtepe, Esatoğlu, Aral, 2020). The Cronbach alpha value calculated for this study was 0.57 for Physical Health Summary Score and 0.65 for Mental Health Summary Score of SF-36.



1st measurement: Preoperatively, before discharge, and on the day of discharge, †2nd measurement: 1st month postoperatively, ‡3rd measurement: 3rd month postoperatively

Figure 1. Sample Criteria and Distributions of Patients Included in the Research Sample

Data Analysis

Data were analyzed using the Statistical Package for Social Science (SPSS 20.0) software. The content validity of the educational booklet prepared for the intervention group was evaluated using Kendall's Coefficient of Concordance by expert opinions. Patients in the intervention and control groups were compared for homogeneity in terms of relevant variables using descriptive statistics (numbers and percentages) and Chi-square ($\chi 2$) tests. The normal

distribution of the data was assessed using the Shapiro-Wilk test before group comparisons. For subsequent comparative analyses, t-tests, one-way ANOVA, two-way ANOVA, and Tukey's HSD (Honestly Significant Difference) multiple comparison tests for advanced analyses were used, with a significance level of $p<0.05$ accepted for all tests.

Ethical Aspects of the Research

This research was planned as a doctoral thesis project and received the necessary approval from the Clinical and Laboratory Research Ethics Committee of the Dokuz Eylül University Faculty of Medicine (Approval No: 02.08.2005/170). Subsequently, due to name changes during the doctoral thesis monitoring process, new ethics committee approvals were obtained (Approval No: 09/17/2009-133/2005, Approval No: 2011/20-14, Approval No: 2015/10-44). Institutional permissions were obtained from the university hospital where the research was conducted (Approval No: B.30.2.AKD.0.1H.00.00/PER-16) and the training and research hospital (Approval No: B.10.4.ISM.4.07.00.38/9796). Permissions for the measurement tools used in the research were also obtained. The purpose of the research was explained to the participating patients, and their written and verbal consents were obtained. Throughout the research, all principles of the Helsinki Declaration were fully adhered to.

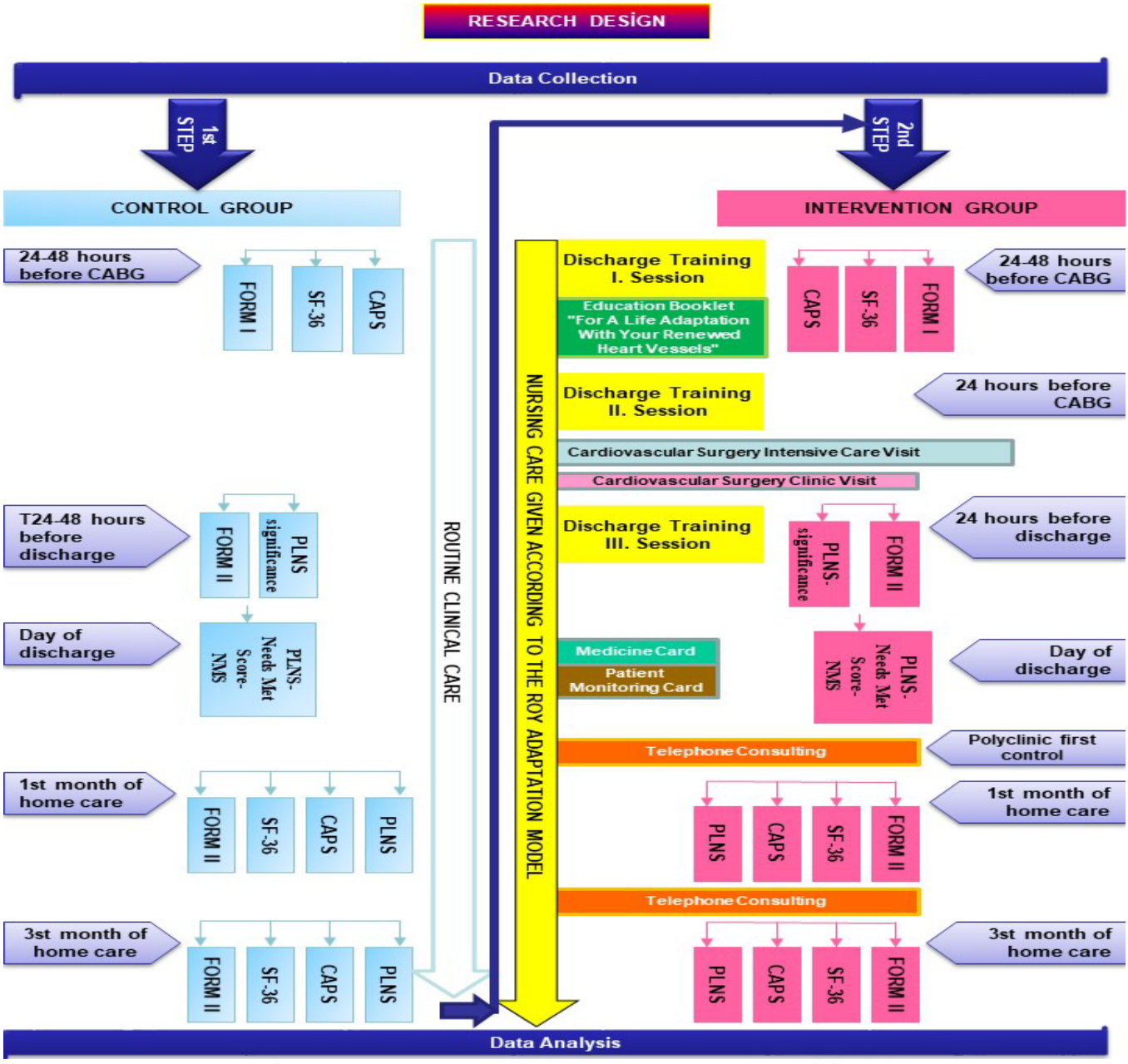


Figure 2. Data Collection Process in Intervention and Control Group Patients

3. Results

Basic Measurement Results

Initially, the sociodemographic and clinical characteristics of patients in the intervention and control groups were examined, and the homogeneity of the groups was tested, with the results detailed in Table 1. The sociodemographic and clinical characteristics of patients in both the intervention and control groups were homogeneous in all respects ($p>0.05$). Additionally, the baseline data for coping-adaptation and quality of life in both groups were evaluated, revealing that the differences in the total scale and all subscale scores of CAPS and SF-36 were statistically insignificant ($p>0.05$), indicating that the groups were similar at baseline.

Table 1. Comparison of Intervention and Control Group Patients According to Socio-Demographic and Clinical Characteristics (n=80)

Socio-Demographic Characteristics		Intervention Group (n: 40)		Control Group (n: 40)		Total (n:80)		Statistical significance
		n	%	n	%	n	%	†$\chi 2$ /*p
Age	30-39	0	0.0	1	2.5	1	1.2	
	40-49	4	10.0	5	12.5	9	11.2	
	50-59	14	35.0	13	32.5	27	33.8	$\chi 2$=1.435 p=0.838
	60-69	13	32.5	14	35.0	27	33.8	
	70 and older	9	22.5	7	17.5	16	20.0	
Gender	Female	14	35.0	12	30.0	26	32.5	$\chi 2$=0.228 p=0.633
	Male	26	65.0	28	70.0	54	67.5	
Marital Status	Single	8	20.0	8	20.00	40	50.00	
	Married	32	0 80.0 0	32	80.00	40	50.00	$\chi 2$=0.000 p=1.000
Educational Status	Elementary School	28	72.5	33	82.5	61	76.3	
	Middle School	5	12.5	3	7.5	8	10.0	$\chi 2$=1.986 p=0.738
	High School	6	15.0	3	7.5	9	11.2	
	University	1	2.5	1	2.5	2	2.5	
Social Security	Social Security Institution	36	90.0	35	87.5	71	89.8	$\chi 2$=1.104 p=0.776
	Paid	4	10.0	5	12.5	9	11.2	
Working Status	Worker	4	10.0	2	5.0	6	7.5	
	Civil Servant	2	5.0	2	5.0	4	5.0	
	Self-Employed	5	12.5	10	25.0	15	18.8	$\chi 2$=2.522 p=0.641
	Retired	15	37.5	14	35.0	29	36.2	
	Unemployed	14	35.0	12	30.0	26	32.5	
Clinical Characteristics								
Institution of Treatment	University Hospital	20	25.0	20	25.0	40	50.0	$\chi 2$=0.000 p= 1.000
	Training and Research Hospital	20	25.0	20	20.0	40	50.0	
Condition Accompanying CAD**	DM	21	33.3	17	29.3	38	31.4	$\chi 2$=1.816 p= 0.874
	HT	20	31.7	19	32.8	39	32.2	
	COPD	2	3.2	2	3.4	4	3.3	
	CHF	1	1.6	0	0	1	0.8	
	History of previous MI	16	25.4	17	29.3	33	27.3	
	History of angina	3	4.8	3	5.2	6	5.0	
Smoking History	Yes	28	70.0	24	60.0	52	65.0	$\chi 2$=2.196 p=0.138
	No	12	30.0	16	40.0	28	35.0	
Smoking Duration (years)	10-19 years	1	3.6	3	12.5	4	7.7	$\chi 2$=13.586 p=0.328
	20-29 years	7	25.0	6	25.0	13	25.0	
	30 years and above	20	71.4	15	62.5	35	67.3	
Cigarette Consumption (packs/day)	≤ 1/2 packs/day	7	25.0	1	4.2	8	15.4	$\chi 2$=5.804 p=0.326
	1 pack/day	11	39.3	11	45.8	22	42.3	
	≥ 2 packs/day	10	35.7	12	50.0	22	42.3	
Body MaSD Index (BMI)	<18.5	3	7.5	2	5.0	5	6.2	$\chi 2$=4.327 p=0.943
	18.5-24.9	10	25.0	12	30.0	22	27.5	
	25.0-29.9	16	40.0	18	45.0	34	42.5	
	≥30	11	27.5	8	20.0	19	23.8	
Presence of Preoperative Pain Complaints	Yes	21	52.5	17	42.5	38	47.5	$\chi 2$=0.802 p=0.370
	No	19	47.5	23	57.5	42	52.5	
Presence of Preoperative Fatigue Complaints	Yes	25	62.5	26	65.0	51	63.8	$\chi 2$=0.054 p=0.816
	No	15	37.5	14	35.0	29	36.2	
Graft Type	IMA	1	2.5	1	2.5	2	2.5	$\chi 2$=2.077 p=0.150
	IMA + radial artery	5	12.5	6	15.0	11	13.7	
	IMA + saphenous vein	5	12.5	10	25.0	15	18.8	
	IMA + saphenous vein + radial artery	29	72.5	23	57.5	52	65.0	

Duration of Surgical Procedure	60-90 minutes	2	5.0	1	2.5	3	3.8	$\chi 2$=2.502 p=0.550
	91-120 minutes	4	10.0	7	17.5	11	13.7	
	121-150 minutes	28	70.0	23	57.5	44	55.0	
	151 minutes and above	6	15.0	9	22.5	22	27.5	
Cardiopulmonary By-paSD Duration	30-60 minutes	2	5.0	1	2.5	3	3.8	$\chi 2$=2.134 p= 0.715
	61-90 minutes	33	82.5	32	80.01	65	81.2	
	91 minutes and above	5	12.5	7	7.5	12	15.0	
Length of Stay in Intensive Care	LeSD than 24 hours	28	70.0	24	60.0	52	65.0	$\chi 2$=5.710 p= 0.956
	24-48 hours	12	30.0	16	40.0	28	35.0	
Duration of Mechanical Ventilation	LeSD than 8 hours	22	55.0	27	67.5	49	61.2	$\chi 2$=3.338 p= 0.949
	9-14 hours	18	45.0	13	32.5	31	38.8	

** p>0.05, †$\chi 2$= Chi-Square test result, n: Number, %: Percantage; **More than one option was selected.; CAD: Coronary Artery Disease, DM: Diabetes Mellitus, HT: Hypertension, COPD: Chronic Obstructive Pulmonary Disease, CHF: Congestive Heart Failure, MI: Myocardial Infarction, IMA: Internal Mammary Artery*

Importance of Discharge Learning Needs and the Level of Meeting of These Needs

In the study, during the phase of determining how important the learning needs were for patients undergoing CABG surgery in both the intervention and control groups, the total scale score of PLNS-IS (Importance Score) was found to be 175.35±18.68 (3.50±0.37) for the intervention group and 165.90±13.69 (3.31±0.27) for the control group. Additionally, the learning needs in the subdimension of "Activities of living" ranked first in both groups. The comparison results of the total scale scores of PLNS-IS for patients undergoing CABG before discharge, in the first month, and in the third month showed statistically significant differences between the intervention and control groups in terms of group (F=63.064, p=0.000) and time (F=272.342, p=0.000) interactions, while no significant difference was found regarding group*time (F=0.655, p=0.520). The level of importance given to the discharge learning needs by patients in the intervention group was found to be significantly higher than that of the control group (p<0.05). To determine which measurement contributed to the difference in the average total scale scores of PLNS-IS, tests indicated statistically significant differences among the intervention and control group average scores before discharge (t=-2.580, p=0.012), one month post-surgery (t=-6.512, p=0.000), and three months post-surgery (t=-8.060, p=0.000) (Table 2).

Table 2. Comparison of the Importance of Learning Needs of Intervention and Control Group Patients Before Discharge, the First Month and the Third Month After Surgery (n:80)

Time / Groups	Before Discharge *(BD)* (Mean±SD†)	1st Month Post-Surgery *(PS1)* (Mean±SD)	1st Month Post Surgery *(PS3* (Mean±SD)	Comparison	F‡	p*	*Significant difference*
Medications-IS							
Intervention Group (n: 40)	3.48±0.42	4.07±0.27	4.34±0.22	Group	**61.760**	**0.000**	*BD<PS1<PS3*
Control Group (n: 40)	3.22±0.39	3.76±0.28	3.93±0.27	Time	**128.830**	**0.000**	*BD<PS1,PS3*
				Group*Time	1.119	0.328	
Activities of living-IS							
Intervention Group (n:40)	3.73±0.26	4.33±0.20	4.62±0.18	Group	**41.930**	**0.000**	*BD<PS1<PS3*
Control Group (n:40)	3.70±0.25	4.06±0.28	4.32±0.22	Time	**210.544**	**0.000**	*BD<PS1<PS3*
				Group*Time	**7.615**	**0.001**	
Community and follow-up-IS							
Intervention Group (n:40)	3.18±0.51	3.94±0.40	4.02±0.35	Group	**8.972**	**0.000**	*BD<PS1<PS3*
Control Group (n:40)	3.02±0.43	3.77±0.33	3.90±0.29	Time	**112.788**	**0.000**	*BD<PS1<PS3*
				Group*Time	0.076	0.926	
Feelings related to condition-IS							
Intervention Group (n:40)	3.31±0.42	4.38±0.43	4.51±0.41	Group	1.358	0.245	
Control Group (n:40)	3.23±0.37	4.37±0.42	4.42±0.38	Time	211.337	**0.000**	*BD<PS1<PS3*
				Group*Time	0.245	0.783	
Treatment and complications-IS							
Intervention Group (n:40)	3.66±0.40	4.23±0.27	4.63±0.18	Group	**80.071**	**0.000**	*BD<PS1<PS3*
Control Group (n:40)	3.39±0.31	3.79±0.25	4.36±0.20	Time	**232.786**	**0.000**	*BD<PS1<PS3*
				Group*Time	2.125	0.122	
Enhancing quality of life-IS							
Intervention Group (n:40)	3.48±0.49	4.29±0.25	4.46±0.18	Group	**97.125**	**0.000**	*BD<PS1<PS3*
Control Group (n:40)	3.21±0.31	3.84±0.27	4.00±0.24	Time	**181.594**	**0.000**	*BD<PS1<PS3*
				Group*Time	2.672	0.071	

Skin care-IS							
Intervention Group (n:40)	3.47±0.55	3.55±0.42	3.56±0.42	Group	0.215	0.643	*p>0.05*
Control Group (n:40)	3.24±0.52	3.62±0.46	3.64±0.45	Time	**6.797**	**0.001**	*BD<PS1,PS3*
				Group*Time	2.727	0.067	
TOTAL PLNS-IS							
Intervention Group (n:40)	3.50±0.37	4.14±0.17	4.36±0.14	Group	**63.064**	**0.000**	*BD<PS1<PS3*
Control Group (n:40)	3.31±0.27	3.88±0.18	4.10±0.14	Time	**272.342**	**0.000**	*BD<PS1<PS3*
				Group*Time	0.655	0.520	

*p<0.05, †SD: Standard Deviation, ‡F: Two-way analysis of variance; PLNS: Patient Learning Needs Scale, IS: Importance Score

Accordingly, the analysis of the "PLNS-NMS total score" for both groups revealed statistically significant differences in terms of group (F=7878.263, p=0.000), time (F=19.844, p=0.000), and grouptime (F=0.655, p=0.520) interactions. In the intervention group, the repeated measurements of PLNS-NMS total scores showed significant increases in the average scores for the first and third months post-surgery (p<0.05), while in the control group, the differences between the measurements on the day of discharge, one month post-surgery, and three months post-surgery were statistically insignificant (p>0.05) (Table 3).

Table 3. Comparison of the Levels of Meeting Learning Needs of the Intervention and Control Group Patients on the Day of Discharge, the First Month and the Third Month After Surgery (n:80)

Time / **Groups**	**Discharge Day *(DD)*** (Mean±SD†)	**1st Month Post-Surgery *(PS1)*** (Mean±SD)	**1st Month Post-Surgery *(PS2)*** (Mean±SD)	**Comparison**	**F‡**	**p***	***Significant difference***
Medications-IS							
Intervention Group (n: 40)	4.80±0.10	4.98±0.03	4.98±0.03	Group	**4085.808**	**0.000**	*DD<PS1,PS3*
Control Group (n: 40)	3.06±0.32	3.30±0.26	3.30±0.26	Time	**28.340**	**0.000**	*DD<PS1,PS3*
				Group*Time	0.392	0.676	
Activities of living-NMS							
Intervention Group (n:40)	4.74±0.13	4.84±0.11	4.87±0.09	Group	**3721. 398**	**0.000**	*DD<PS1,PS3*
Control Group (n:40)	3.32±0.23	3.36±0.23	3.36±0.23	Time	**4.781**	**0.009**	*p>0.05*
				Group*Time	1.315	0.271	
Community and follow-up-NMS							
Intervention Group (n:40)	4.70±0.13	4.70±0.14	4.72±0.13	Group	**2697.374**	**0.000**	*p>0.05*
Control Group (n:40)	2.81±0.35	2.81±0.35	2.81±0.35	Time	0.014	0.986	*p>0.05*
				Group*Time	0.014	0.986	
Feelings related to condition-NMS							
Intervention Group (n:40)	4.47±0.22	4.72±0.18	4.72±0.18	Group	**2508.111**	**0.000**	*DD<PS1,PS3*
Control Group (n:40)	2.64±0.37	2.65±0.39	2.65±0.39	Time	**5.130**	**0.007**	*p>0.05*
				Group*Time	4.053	0.019	
Treatment and complications-NMS							
Intervention Group (n:40)	4.58±0.18	4.85±0.09	4.90±0.07	Group	3511.44	**0.000**	*DD<PS1,PS3*
Control Group (n:40)	2.90±0.33	3.00±0.29	3.00±0.29	Time	18.721	**0.000**	*p>0.05*
				Group*Time	4.429	**0.013**	
Enhancing quality of life-NMS							
Intervention Group (n:40)	4.35±0.15	4.75±0.15	4.75±0.15	Group	**3273.6803**	**0.000**	*DD<PS1,PS3*
Control Group (n:40)	2.96±0.26	3.05±0.26	3.05±0.26	Time	**3.680**	**0.000**	*p>0.05*
				Group*Time	**13.840**	**0.000**	
Skin care-NMS							
Intervention Group (n:40)	4.85±0.10	4.78±0.16	4.78±0.16	Group	**1841.162**	**0.000**	*DD>PS1,PS3*
Control Group (n:40)	3.10±0.42	3.03±0.41	3.03±0.41	Time	1.312	0.271	*p>0.05*
				Group*Time	0.007	0.993	
TOTAL PLNS-NMS							
Intervention Group (n:40)	4.64±0.06	4.82±0.05	4.83±0.04	Group	**7878.263**	**0.000**	*DD<PS1,PS3*
Control Group (n:40)	2.99±0.22	3.06±0.19	3.06±0.19	Time	**19.844**	**0.000**	*p>0.05*
				Group*Time	**3.878**	**0.022**	

*p<0.05, †SD: Standard Deviation, ‡F: Two-way analysis of variance; PLNS: Patient Learning Needs Scale, NMS: Needs Met Score

Perception of Recovery

In comparing the perception of recovery scores of CABG patients in the intervention and control groups, statistically significant differences were found based on group (F=26.894, p=0.000), time (F=201.156, p=0.000), and group*time (F=5.923, p=0.003) interactions. In both groups, the average scores for perception of recovery significantly increased compared to pre-discharge measurements at one month and three months post-surgery (Table 4).

Table 4. Comparison of the Perception of Recovery and Control Group Patients Before Discharge, the First Month and the Third Month After Surgery (n:80)

Time / Groups	Before Discharge *(BD)* (Mean±SD†)	1st Month Post-Surgery *(PS1)* (Mean±SD)	1st Month Post-Surgery *(PS2)* (Mean±SD)	Comparison	F‡	p*	*Significant difference*
Perception of Recovery							
Intervention Group (n: 40)	4.50±1.63	7.87±1.26	8.95±0.95	Group	**26.894**	**0.000**	*BD<PS1<PS3*
Control Group (n: 40)	4.02±1.81	6.05±1.51	8.42±1.03	Time	**201.156**	**0.000**	*BD<PS1<PS3*
				Group*Time	**5.923**	**0.003**	

**p<0.05, †SD: Standard Deviation, ‡F: Two-way analysis of variance.*

Coping-Adaptation Level

When comparing the coping-adaptation levels of CABG patients in the intervention and control groups, statistically significant differences were found in terms of "CAPS total score" for group (F=36.187, p=0.000), time (F=12.532, p=0.000), and group*time (F=4.496, p=0.012) interactions. According to advanced analysis results, the average scores for the intervention group at one month and three months post-surgery were statistically significantly higher than their pre-surgery average scores (p<0.05). In the control group, however, the differences between measurements were not statistically significant (p>0.235). In comparing the average scores of both groups in all subdimensions of "Resourceful and focused", "Physical and fixed", "Alert processing", "Systematic processing", and "Knowing and relating" statistically significant differences were also observed between the two groups at one month and three months post-surgery (p=0.000) (Table 5).

Table 5. Comparison of Coping-Adaptation Level of Intervention and Control Group Patients Before Discharge, the First Month and the Third Month After Surgery (n:80)

Time / Groups	Before Surgery (*BS*) (Mean±SD†)	1st Month Post-Surgery (PS1) (Mean±SD)	1st Month Post-Surgery (PS2) (Mean±SD)	Comparison	F‡	p*	*Significant difference*
Resourceful and focused							
Intervention Group (n: 40)	26.35±3.69	28.60±3.11	29.82±2.98	Group	**15.388**	**0.000**	*BS<PS1,PS3*
Control Group (n: 40)	26.15±3.71	26.32±3.66	27.05±3.47	Time	**8.046**	**0.000**	*p>0.05*
				Group*Time	3.123	0.046	
Physical and fixed							
Intervention Group (n:40)	39.20±3.86	40.40±3.57	42.90±3.34	Group	**11.033**	**0.001**	*BS,PS1<PS3*
Control Group (n:40)	39.22±4.42	38.32±4.54	39.87±3.77	Time	**7.585**	**0.001**	
				Group*Time	3.130	0.046	*p>0.05*
Alert processing							
Intervention Group (n:40)	25.12±4.64	26.77±4.87	27.90±2.44	Group	**18.123**	**0.000**	*BS<PS3*
Control Group (n:40)	23.85±2.76	24.50±2.69	24.67±2.71	Time	**3.298**	**0.039**	*p>0.05*
				Group*Time	0.518	0.597	
Systematic processing							
Intervention Group (n:40)	15.82±2.07	17.37±1.42	18.07±1.62	Group	**46.096**	**0.000**	*BS<PS1,PS3*
Control Group (n:40)	15.22±2.00	15.22±2.00	16.00±1.78	Time	**13.592**	**0.000**	
				Group*Time	**4.538**	**0.012**	*p>0.05*
Knowing and relating							
Intervention Group (n:40)	21.92±2.52	23.82±2.36	25.35±2.43	Group	**8.647**	**0.004**	*BS< PS3*
Control Group (n:40)	21.55±2.49	21.77±2.49	21.92±2.69	Time	**2.641**	**0.037**	*p>0.05*
				Group*Time	0.904	0.406	
TOTAL CAPS							
Intervention Group (n:40)	128.42±10.45	135.97±9.85	141.05±9.65	Group	**36.187**	**0.000**	*BS<PS1,PS3*
Control Group (n:40)	126.00±10.40	126.15±10.26	129.52±10.54	Time	**12.532**	**0.000**	
				Group*Time	**4.496**	**0.012**	*p>0.05*

**p<0.05, †SD: Standard Deviation, ‡F: Two-way analysis of variance; CAPS: Coping and Adaptation Processing Scale*

Quality of Life

Finally, the quality of life levels of patients in the intervention and control groups were examined in terms of physical health and mental health. For the "Physical Health Summary Score" and "Mental Health Summary Score", two-way ANOVA results indicated statistically significant differences in terms of group (FPhysical Health=14.677, p=0.000) (FMental Health=5.170, p=0.024), time (FPhysical Health=44.119, p=0.000) (FMental Health=77.817, p=0.000), and group*time (FPhysical Health=13.269, p=0.000) (FMental Health=10.203, p=0.000) interactions (Table 6).

Table 6. Comparison of Quality of Life of Intervention and Control Group Patients Before Discharge, the First Month and the Third Month After Surgery (n:80)

Time / Groups	Before Surgery (BS) (Mean±SD†)	1st Month Post-Surgery (PS1) (Mean±SD)	1st Month Post-Surgery (PS2) (Mean±SD)	Comparison	F‡	p*	*Significant difference*
Physical function							
Intervention Group (n: 40)	55.12±24.48	82.37±7.16	99.00±2.81	Group	**7.757**	**0.005**	*BS<PS1<PS3*
				Time	**99.730**	**0.000**	*BS<PS1<PS3*
Control Group (n: 40)	64.87±23.30	74.00±14.10	92.25±11.26	Group*Time	**7.901**	**0.000**	
Physical role							
Intervention Group (n:40)	36.25±48.02	85.00±29.30	95.62±15.89	Group	**11.555**	**0.001**	*BS<PS1,PS3*
				Time	**36.441**	**0.000**	*BS, PS1<PS3*
Control Group (n:40)	40.62±47.93	40.62±47.93	85.00±29.30	Group*Time	**8.432**	**0.000**	
Pain							
Intervention Group (n:40)	55.82±30.57	78.97±10.90	91.90±9.94	Group	**7.588**	**0.006**	*BS<PS1<PS3*
				Time	**76.570**	**0.000**	*PS1,BS <PS3*
Control Group (n:40)	61.50±29.59	49.12±11.12	95.50±8.88	Group*Time	**21.378**	**0.000**	
General Health							
Intervention Group (n:40)	62.25±17.43	79.77±12.08	79.77±12.08	Group	**6.197**	**0.013**	*BS< PS1,PS3*
				Time	**18.485**	**0.000**	*BS<PS1,PS3*
Control Group (n:40)	64.65±14.26	66.17±20.00	76.17±14. 62	Group*Time	**5.545**	**0.004**	
Physical Health Summary Score							
Intervention Group (n:40)	39.84±11.34	52.42±9.89	55.04±7.61	Group	**14.677**	**0.000**	*BS<PS1,PS3*
				Time	**44.119**	**0.000**	*PS1<BS<PS3*
Control Group (n:40)	40.05±12.13	38.00±10.56	54.33±7.94	Group*Time	**13.269**	**0.000**	
Vitality							
Intervention Group (n: 40)	42.37±17.79	77.37±9.80	90.50±8.75	Group	**36.622**	**0.000**	*BS<PS1<PS3*
				Time	**172.052**	**0.000**	*BS<PS1<PS3*
Control Group (n: 40)	40.12±22.17	45.37±21.93	86.75±10.71	Group*Time	**21.372**	**0.000**	
Social function							
Intervention Group (n:40)	57.18±29.94	72.81±12.62	99.37±3.95	Group	**6.751**	**0.010**	*BS<PS1<PS3*
Control Group (n:40)	65.62±31.10	47.81±20.58	95.00±11.60	Time	**81.349**	**0.000**	*PS1,BS <PS3*
				Group*Time	**13.148**	**0.000**	
Mental function							
Intervention Group (n:40)	52.50±17.28	81.70±15.68	83.70±14.13	Group	**16.190**	**0.000**	*BS<PS1,PS3*
Control Group (n:40)	54.40±20.65	54.10±19.15	83.10±13.07	Time	**63.013**	**0.000**	*PS1, BS<PS3*
				Group*Time	**18.790**	**0.000**	
Mental role							
Intervention Group (n:40)	48.33±50.04	82.50±38.48	82.50±38.48	Group	**3.760**	**0.045**	*BS< PS3*
Control Group (n:40)	50.83±50.06	50.83±50.06	78.33±36.63	Time	**9.689**	**0.000**	*BS,PS1< PS3*
				Group*Time	**3.330**	**0.038**	
Mental Health Summary Score							
Intervention Group (n:40)	40.48±10.11	50.75±4.80	56.46±3.43	Group	**5.170**	**0.024**	*BS<PS1<PS3*
				Time	**77.817**	**0.000**	*BS,PS1<PS3*
Control Group (n:40)	43.37±8.79	43. 75±7.28	54.48±4.45	Group*Time	**10.203**	**0.000**	

**p<0.05, †SD: Standard Deviation, ‡F: Two-way analysis of variance*

4. Discussion

The results obtained from the research were discussed under separate headings regarding the importance of discharge learning needs, the status of meeting of these needs, perception of recovery, coping-adaptation level, and quality of life levels.

Examination of Discharge Learning Needs and Their Meeting Status

Determining patients' learning needs and providing individualized care according to these priorities leads to patients experiencing less anxiety in home care management, positively affecting their coping and adaptation, thus increasing their quality of life (Fredericks, İbrahim, Puri, 2009). The significant differences observed in almost all areas and measurements regarding the importance of learning needs for discharge among patients in both the intervention and control groups ($p<0.05$) are noteworthy (Table 2). Additionally, it is striking that patients evaluated their learning needs at discharge as "very important" in the intervention group and "neither less nor more important" in the control group, suggesting that the information provided during the initial two educational sessions of nursing care in the intervention group significantly influenced these high scores. Furthermore, it is important that the most significant items identified by both the intervention and control groups of patients undergoing CABG were related to the subdimension of "Activities of living" Similar results were reported in studies conducted with CABG patients in our country (Uzun and Demirkıran, 2012; Erdoğan and Yılmaz, 2025; Sarıtaş, Erci, Boyraz, 2018). The results of Jickling and Graydon (1997) and Chesnick (1992) were similar. However, in Erdoğan's (2012) study, the highest learning needs were reported for treatment and complications, quality of life, and medications. It is noteworthy that studies conducted with CABG patients in the literature emphasize issues related to physical activity (Çayırtepe, Esatoğlu, Aral, 2020; Çelik, 2025), supporting our research findings.

The level of meeting of learning needs for patients undergoing CABG surgery is one of the important results of this research. This is because statistically significant differences were revealed in the meeting of learning needs between the intervention and control groups in terms of the total score of PLNS-NMS and the sub-dimensions of "Feelings related to condition-NMS", "Treatment and complications-NMS", and "Enhancing quality of life -NMS" ($p<0.05$) (Table 3). In the prominent subdimension of learning needs, "Activities of Living-NMS," significantly higher scores were reported in the intervention group at one month and three months post-surgery compared to pre-surgery measurements, while no difference was observed in the control group. Moreover, it is noteworthy that patients in the intervention group receiving nursing care reported that their needs were "fully met" in all measurements at discharge, one month, and three months, while patients receiving clinical routine care indicated that their needs were "neither less nor more met". Given these results, it can be stated that the topics of the educational sessions conducted for the intervention group, the discharge education booklet, follow-up, and the information provided during telephone counseling were effective. There have been no studies found in the literature that used PLNS-NMS in patients undergoing CABG. This indicates a need to evaluate the meeting status of learning needs in the CABG patient group. In addition, considering the studies conducted with patients who underwent CABG surgery, the results showing that the training booklet was effective (Olgun and Özşaker, 2024), showing that telephone follow-up was effective (Emre and Tuna, 2021), and showing that counseling was effective (Avcı Işık and Karaöz, 2022; İlgin et al., 2024) support our research findings.

Examination of Perception of Recovery

When comparing the perception of recovery in patients in the intervention and control groups, statistically significant differences were found in the measurements before discharge, one month, and three months post-surgery ($p<0.05$). The doubling of the perception of recovery score in the intervention group at one month post-surgery and the near value of "I have recovered" in the last measurement are quite significant. In this context, especially the average perception of recovery score of 7.87±1.26 in the intervention group is higher than that of the control group and the patient results from Kan's (2007) study, which can be explained by the effectiveness of the intervention and is clinically noteworthy. In the literature, negative outcomes regarding the recovery process of patients with CABG have been reported (Çakır, Karacabay, Karaveli Çakır, 2024; Makino, Nakata, & Yoshida, 2024), which may indicate the need for new studies.

Examination of Coping-Adaptation Levels

The statistically significant differences found in the total score of CAPS and in the subdimensions of "Resourceful and Focused", "Physical and Fixed", and "Systematic Processing" ($p<0.05$) regarding the coping-adaptation levels of patients in the intervention and control groups are noteworthy. It was determined that the significant difference observed in the intervention group was due to higher scores in the

one-month and three-month post-surgery measurements compared to the initial measurements, while no significant difference was observed in the control group ($p>0.05$). According to the Roy Adaptation Model, CABG surgery is a focal stimulus affecting individuals' adaptation levels, and patients return to a conciliatory adaptation level with surgery (Çatal and Dicle, 2011; Roy, 2009). Although several studies have examined coping and adaptation in patients undergoing CABG using various psychological and coping instruments, no study to date has specifically assessed coping-adaptation levels using the CAPS (Tung et al. 2008, Boudrez and De Backer 2001). When examining the results of studies that investigated patients' coping post-surgery using different measurement tools, it was found that CABG patients showed improvement in coping from the fourth week post-surgery, with further increases until the sixth month, but no changes were observed in the period between six months and one year (Boudrez and De Becker, 2001). Tung, Hunter, and Wei (2008) reported that self-blame was a common approach for patients to cope. Redeker (1992) stated that there is a need to improve coping in patients post-cardiac surgery. In a review, the emphasis on the need for studies on the effects of surgery and coping, particularly in female patients undergoing CABG, is noteworthy (Çayırtepe, Esatoğlu, Aral, 2020). Despite this limitation in the discussion, the results obtained from this research significantly contribute to the literature regarding the positive effects of nursing care based on the Roy Adaptation Model on patients' coping-adaptation levels.

Examination of Quality of Life Levels

Finally, the quality of life levels of patients in the intervention and control groups who underwent CABG surgery were examined. Many studies have evaluated the quality of life in patients post-CABG surgery. In the assessment of quality of life through repeated measurements in terms of physical health and mental health in both the intervention and control groups, the higher average quality of life scores in the intervention group at one month and three months post-surgery in all components except for the "Pain" component is a significant finding. Moreover, it is noteworthy that patients in the intervention group reported significant increases in quality of life levels across all eight subcomponents at one month post-surgery compared to the pre-surgery period. In this context, it can be stated that the discharge education provided, telephone follow-ups, and counseling were effective in improving the quality of life of patients undergoing CABG in the intervention group. Contrary to our research, in the study by Özdemir and Önler (2021), which tested the effect of structured education, significant quality of life scores were only reported in favor of the intervention group concerning general health and social functioning. In the systematic review of studies evaluating quality of life post-CABG by Çayırtepe, Esatoğlu, and Aral (2020), 26 studies were examined, and negative effects of physical condition, living alone, and acute cardiac and cerebrovascular events were reported. Based on these results, it can be stated that there will continue to be a need for the evaluation of quality of life in patients undergoing CABG.

Limitations of the Study: Although a randomised controlled design would provide stronger evidence, practical constraints such as data collection in a clinical setting, continuity of care in the intervention, repeated measurements, and the inability to prevent patient interactions within the same unit necessitated the use of a quasi-experimental design. Consequently, the absence of randomisation may compromise the internal validity and generalisability of the findings.

5. Conclusions

According to the results obtained from the research, all hypotheses were confirmed; it was concluded that the nursing care provided to patients undergoing CABG has an effective impact on the importance of learning needs, the meeting status of learning needs, perception of recovery, coping-adaptation level, and quality of life in terms of physical and mental health. Additionally, many concepts of the Roy Adaptation Model, which also formed the theoretical framework of this study, were able to be tested.

Ethical Statement

*This research is the doctoral dissertation of the first author, and the second author is the thesis advisor. The relevant doctoral dissertation can be accessed through the National Thesis Center.

**The results of this research were presented as an oral presentation in the "Award-Nominated Abstracts" category at the 14th Turkish Society of Cardiovascular Surgery Congress held in Antalya in 2016 (November 2-6, 2016), and an abstract was published in the relevant congress's Abstract Book. It has not been published in any other journal or other publication, nor is it registered on any platform for publication.

Ethics Committee Approval: This research was planned as a doctoral thesis project, and the necessary approval was received from the Dokuz Eylül University Faculty of Medicine Clinical and Laboratory Research Ethics Committee (Issue no: 02.08.2005/170). Later, because name changes were made during the doctoral thesis monitoring process, new ethics committee approvals were obtained (Issue no: 09/17/2009-133/2005, Issue no: 2011/20-14, Issue no: 2015/10-44).

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