

Impact of implementing a nurse caring behavior protocol on postoperative cardiac patient satisfaction

Suad Elsayed Abdelmotalb Elsaman ^(1*) , Nadia Taha Ahmed ⁽¹⁾, Mohamed Adel Ghoneam ⁽²⁾

(1) Critical Care and Emergency Nursing Department, Faculty of Nursing, Alexandria University, Egypt.

(2) Medical Surgical Nursing Department, Faculty of Nursing, Beni-Suef University, Egypt.

(*) Corresponding author e-mail addresses: suad.elsaman@alexu.edu.eg

Abstract

Background: Critical care nurses (CCNs) need to comply with caring behaviors when caring for postoperative cardiac patients. Furthermore, patient satisfaction is a key indicator of nursing care quality. As such, this study focused on these critical issues considering the limited research available on the impact of caring behaviors on postoperative cardiac patient satisfaction. **Aim:** To evaluate the impact of implementing a nurse caring behavior (NCB) protocol on postoperative cardiac patient satisfaction. **Design:** A randomized controlled trial with two parallel groups design was followed. **Setting:** The study was conducted at a cardiac surgery intensive care unit in the Teaching Main University Hospital, Alexandria, Egypt. **Subjects:** A total of 60 patients were included in this study during the first 2 days following surgery. Patients were randomly assigned to either a control group, which received routine nursing care, or a protocol group, which received NCBs protocol through simple randomization method. **Tool of data collection** One tool was used “Postoperative Cardiac Patient Satisfaction with NCBs Evaluation”. **Results:** The protocol group was significantly satisfied with the NCB protocol that was applied during admission and orientation process, physical and psychological care, social interaction between patients and nurses, health teaching competencies, and maintenance of a healing environment ($p = 0.00$). **Conclusion:** Incorporating NCBs into nursing practice improved postoperative cardiac patient satisfaction. **Recommendation:** This study raises awareness among CCNs regarding the necessity of applying NCBs in the postoperative care of cardiac patients to get their satisfaction.

Keywords: Cardiac patient, Nurse caring behaviors, Postoperative, Satisfaction.

Introduction

Critical care nurses (CCNs) spend more time and interact with postoperative cardiac patients in intensive care units (ICUs) than any other health care provider. Given that nursing is an ethical profession, nurses have a significant impact on patient satisfaction through the caring behaviors they provide. Although nurses' adherence to caring behaviors principles while providing care protects patient safety and promotes faster recovery, researches illustrate that nurses do not adhere to caring behaviors when providing care (Bijani et al., 2017; Lukmanulhakim et al., 2019).

Caring behavior concentrates on the nurse–patient relationship by responding to patients' physical, psychological, and social needs, avoiding harm by maintaining a safe healing environment, and providing proper health teaching (Juujärvi et al., 2019). As such, CCNs are responsible for adopting holistic caring behaviors such as respecting patients' privacy and feelings, providing

reassurance, establishing a trusting nurse–patient relationship, providing a sense of control, allowing patient participation in care-related decisions, inspiring hope, supporting the patients' families, and providing spiritual care (Izadi et al., 2020). Nurse caring behaviors (NCBs) require consistent commitment to a holistic nursing approach to patient care.

In other words, NCBs are used for not only providing patient care but also maintaining patients' motivational balance when they are subjected to a stressful environment. NCBs enable CCNs to provide soft skills in addition to physically demanding care. Soft skills include the ability to communicate, connect with people, understand others, accept responsibility, collaborate, empathize, and care for others (Aty et al., 2020). According to Bagnasco et al. (2020), caring behaviors comprise physical, psychological, and emotional behaviors. Furthermore, Chaboyer et al. (2021) demonstrated that no caring behaviors is superior to another; however, nurses tend to

focus on physical behaviors while ignoring others. Davoodi et al.(2020) demonstrated that emergency nurses prioritize physical caring over affective caring. In addition, Akansel et al.(2021) discovered that nurses focus on technical and physical behaviors; whereas, Oswal et al.(2021) revealed that nurses pay more attention to physical and emotional behaviors.

Nurse caring behaviors are concerned with humanism, sharing\reassurance, establishing a trusting relationship, promoting a sense of control, inspiring hope, fostering orientation, spiritual care, comforting, and maintaining a therapeutic relationship. Humanism includes respecting the patients' privacy and feelings. sharing/promoting reassurance includes maintaining eye contact during nurse–patient interactions and informing patients regarding goals. Establishing a trusting relationship includes responding quickly and appropriately to calls and assisting in setting realistic goals. promoting a sense of control includes allowing the patients to participate in care-related decisions. Inspiring hope includes repeating statements that instill hope. Fostering orientation includes orienting patients to the day, time, place, and person, explaining the rationale for alarms and other distressing sounds. Spiritual care includes offering religious sound meditation. Promoting comfort includes allowing patients to bring a familiar object. Maintaining the therapeutic relationship includes recognizing verbal and non-verbal messages, and encouraging the patient to initiate a conversation(Akgün et al., 2020; Kibret et al., 2022; Klarare et al., 2021; Salimi & Tarbiat, 2021).

Significance of the study

Postoperative cardiac patients require extensive physical care, including adequate fluid resuscitation, inotropic support, and mechanical ventilation management(Meadows et al., 2018). Moreover, these patients need psychological care given the stress associated with ICU admission due to the presence of strange medical equipment, invasive procedures, unfamiliar noises, excessive lights, lack of privacy, separation from family, and immobilization, all of which contribute to a stressful environment(ÖZŞAKER et al., 2021).

As such, these patients are predisposed to psychosocial reactions, such as anxiety, depression, self-esteem damage, and perceived powerlessness. These psychological problems can prolong the duration of mechanical ventilation, ICU stay, and wound healing(Suparman Rustam et al., 2018). Hence, CCNs cannot manage practice challenges unless they adhere to caring behavior principles(Izadi et al., 2020).

Meadows et al. (2018) indicated that caring behaviors provided to postoperative cardiac patients mostly focused on physical care and educational programs, whereas the psychological aspect was neglected. Suparman Rustam et al.(2018) clarified that during mechanical ventilation therapy, comfort requirements might be related to physical, psychospiritual, sociocultural, or environmental factors. In addition, Desborough et al.(2016) demonstrated that ideal nurse care behaviors should address physical, psychological, social, and emotional needs, include health teachings, and maintain a safe healing environment.

Critical care nurses in ICUs spend a significant amount of time with the patients. Consequently, CCNs have a vital role in their patient satisfaction. Postoperative cardiac patient satisfaction with nursing care has generally been regarded as one of the most important regularly utilized predictors of health outcomes and service quality in ICUs. In fact, patient satisfaction influences the timely, efficient, and patient-centered delivery of quality health care(Owaidh et al., 2018). Patient satisfaction can be optimized when patients' perceptions of ideal nursing care are equal to what they receive. Based on the idea that patients are more satisfied with nursing services when CCNs exhibit more caring behaviors when providing such services to them(Aty et al., 2020). As such, this study focused on these critical issues considering the limited research available on patient satisfaction with the quality of a holistic postoperative nursing care based on NCB protocol.

Aim of the study

To evaluate the impact of implementing a nurse caring behavior protocol on postoperative cardiac patient satisfaction.

Research question

What is the impact of implementing a nurse caring behavior protocol on postoperative cardiac patient satisfaction?

Subjects and Methods

Subjects and methods for this study were portrayed under four main designs:

- Technical design
- Operational design
- Administrative design
- Statistical design
- Technical design

The technical design for the study includes research design, setting, subjects and tools for data collection

Research design

A randomized controlled trial with two parallel groups design was used in this study.

Setting

The present study was conducted at a cardiac surgery intensive care unit in the Teaching Main University Hospital, Alexandria, Egypt. The unit contains nine beds and is equipped with advanced machines for managing patients during postoperative period.

Subjects

A total of 60 patients were included in this study.

Inclusion criteria:

- Age from 18–60 years,
- Underwent cardiac surgery, and
- Stayed in the selected ICU for the first 2 days postoperatively.

The exclusion criteria

- Unstable hemodynamics (systolic blood pressure less than 90),
- Uncontrolled dysrhythmias.
- Uncontrolled diabetes mellitus.
- Hemorrhage.
- Chronic respiratory diseases.

Sample size

The sample size was estimated based on power analysis using Epi Info program version 3 (population size = 65/3 month, expected frequency = 50%, accepted error = 5%, confidence coefficient = 99%. An additional 10% of the required sample size was added to overcome rolled-out patients.

Technique:

The first patient meeting the previous criteria was taken as the first one in the studied sample until the sample reached total number of the study.

The included 60 patients were randomly assigned to either a control group (30 patients), which received routine nursing care, or a protocol group (30 patients), which received NCBs protocol using simple randomization method as odd numbers were assigned to the routine group, whereas even numbers were assigned to the protocol group. Patient allocation was fixed to be handled by the one researcher. This researcher was not blinded to NCBs protocol and provided NCBs protocol to the protocol group, while the staff nurses were blinded to NCBs protocol and provided ICU routine care to the control group. The other researcher who assessed patients' outcomes was blinded to allocation and intervention.

Ethical consideration:

Participating literate patients or illiterate patients' surrogates provided written informed consent preoperatively after being informed regarding the study's purposes, risks, and benefits. Patients' right to refuse to participate in the study was emphasized to them. The privacy of the patients and confidentiality of the collected data were maintained.

Tool for data collection

One tool was used: "Postoperative Cardiac Patient Satisfaction with NCBs Evaluation". The tool included two parts as follows:

Part I: Patient's demographic data

This part was used to focus on the patients' personal profile, such as age, gender, occupation, marital status and level of education.

Part II: Patient satisfaction with NCBs evaluation scale

This part was developed by the researchers after reviewing the related literature (Akgiin et al., 2020; Lucadamo et al., 2021; Molalign Takele et al., 2021; Samant et al., 2021). This part was used to evaluate the participated patient satisfaction with the nursing interventions based on NCBs protocol. The protocol was adapted from Klarare et al. (2021) and Salimi & Tarbiat (2021). The protocol contained thirty-six statement items of nursing interventions based on NCBs during six aspects of nursing care as follows: ICU admission and orientation processes aspect (nine statement items), physical care (eight statement items), psychological care (three statement items), social interaction (six statement items), health teaching (five statement items), and maintaining a safe healing environment (five statement items). Each statement item was rated on a dichotomous scale of (satisfied, dissatisfied) after the researcher asked the patients to report whether they were satisfied with the care provided. Each item was scored as follows: satisfied = 1 and dissatisfied = 0. Thereafter, the total score of each statement item was calculated to obtain patients satisfaction associated with this statement item.

Tool validity and reliability

The content validity of the tool was assessed by five experts in the field of Critical Care Nursing, Faculty of Nursing, Alexandria University. The reliability of the tool was calculated using Cronbach's alpha coefficient $\alpha = 0.82$.

- Operational design
The operational design for the study included:

- Preparatory phase.
- Pilot study.
- Field work.

Preparatory phase:

Reviewing of the related literature to help the researchers to acquire knowledge about the significance of the problem and to guide researchers in preparing the tool to collect the data.

Pilot study

A pilot study was carried out on six patients to evaluate the clarity and applicability of the study tool. These patients were excluded from the sample.

Filed work

Data was collected by the researchers 6days/ week from October 2019 to May 2020. The researchers assessed immediate postoperative cardiac surgery conscious patients daily according to the selecting criteria. patients' demographic data was collected from the medical records using part 1 of the tool.

Intervention

The staff nurses provided routine nursing care to the control group. Routine care concentrated mainly on hard skills of physically demanding care such as monitoring vital signs, endotracheal suctioning, and administering fluids and medications.

The researcher provided nursing interventions based on NCBs protocol through five aspects of nursing care to the protocol group during the two postoperative days. The protocol was provided as follows:

- Caring behaviors during ICU admission and orientation processes included that the researcher welcomed patients, identified themselves to the patient with a soft, gentle voice, oriented patients to time, place, and person, and appropriately addressed patients considering their ages and occupations.
- Caring behaviors during physical care included that the researcher provided a quick and appropriate response to patients' calls, informed patients regarding the purpose and expected duration of mechanical ventilator use and endotracheal tube placement, highlighted the patients' progress, remained calm in emergencies (such as agitation and dysrhythmias) and remained calm while providing care.
- Caring behaviors during psychological care included that the researcher offered religious sound meditation, drew on the positive aspects concerning patients and

their state of health, provided love and enthusiasm for patients, offered verbal reassurance (e.g., “do not be afraid,” “it is not painful,”), provided supportive touch (e.g., tapping the patients' shoulders, handholding, and repeating statements that instill hope).

- Caring behaviors during social interaction included that the researcher maintained eye contact during nurse–patient interaction and made patients feel someone is there if needed.
- Caring behaviors during health teaching included that the researcher provided health teaching for patients (e.g., methods for regulating breathing) and provided the information at enough and suitable time for the patient.
- Finally, Caring behaviors during maintaining a safe healing environment included that the researcher provided patients with an explanation regarding nursing activities that will eventually occur in advance, helped patients to establish realistic goals, explained reasons for alarms and other disturbing sounds, provided basic comfort measures with appropriate lighting, noise control, adequate blankets, reduced environmental stress caused by noise, offensive light, and odor, protected patients from unpleasant scenes, and encouraged the use of glasses or hearing aids and familiar objects.

Outcome measurements

Each patient in both groups was asked individually for 15 to 20 min by one researcher at the end of the second postoperative day to report whether they were satisfied with the delivered NCBs. Patient's answer was documented using the developed tool. The researcher asked the patient regarding his satisfaction with NCBs concerning ICU admission and orientation processes, physical, psychological, and social, health teaching, and maintaining a safe healing environment.

- Administrative design

The researchers collected data from October 2019 to May 2020. Before collecting data, Ethical approval was obtained from

Research Ethics Committee of Faculty of Nursing, Alexandria University, Egypt. In addition, official permission to conduct the study was obtained from the hospital administrative authority.

- Statistical design

The Statistical Package for Social Science version 26.0 was used for data analysis. Data were presented using descriptive statistics in the form of frequencies and percentages. The Chi-square and t-tests were used to compare frequencies between study variables. A p value of ≤ 0.05 indicated statistical significance.

Results

Sixty-six patients were enrolled in the study. Three patients were excluded as two patients did not meet the inclusion criteria and one patient declined to participate. Thus, the patients were sixty-three and they were assigned as thirty-one patients in the protocol group and thirty-two patients in the control group. During the intervention phase, one patient from the protocol group withdrew and two patients from the control group discontinued to participate in the study because they had hypotension. So, sixty patients completed the study as thirty patients in the control group and thirty patients the protocol group (Figure 1).

Table 1 illustrates no significant difference between the two groups regarding age, sex, and level of education ($p \geq 0.05$).

Table 2 compares the two groups according to patient satisfaction with NCBs during the ICU admission and orientation processes. The protocol group was significantly satisfied with the admission and orientation process compared to the control group ($p \leq 0.05$). On the other hand, all patients in the control group were significantly dissatisfied with the routine care associated with feasibility of communication with nurses.

Table 3 compares the two groups regarding patient satisfaction with the NCBs related to physical, psychological, and social behaviors. The protocol group was significantly satisfied with the physical and psychological care, and social interaction between patients and nurses compared to the

control group ($p \leq 0.05$). On the other hand, the control group expressed their dissatisfaction primarily for three reasons: nurses' unavailable; nurses' incapability, and decreased contact time between nurses and patients.

Table 4 compares the two groups concerning patient satisfaction with NCBs related to health teaching competencies. The protocol group was significantly satisfied with the health teaching provided compared to the control group ($p \leq 0.05$).

Table 5 compares the two groups concerning patient satisfaction with NCBs related to maintaining a healing environment. The protocol group was significantly satisfied with maintaining a healing environment compared to the control group ($p \leq 0.05$). The control group was dissatisfied with the unavailability of using glasses, hearing aids, and familiar objects.

Figure 1: Flow Diagram of subjects through the study

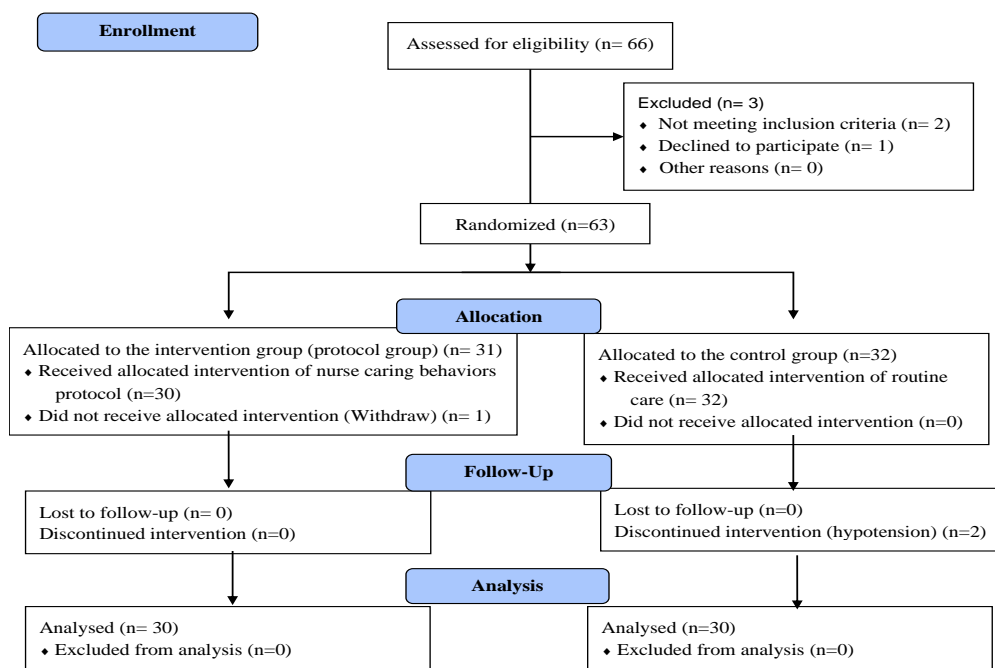


Table 1. Distribution of the groups regarding socio-demographic data

Socio-demographic data	Protocol group (n = 30)	Control group (n = 30)	Significance test χ^2 (p)
Age			
20 to <35	6 (20.0)	10 (33.3)	2.04 (0.56)
35 to <45	11 (36.7)	7 (23.3)	
45 to <55	7 (23.3)	6 (20.0)	
≥ 55	6 (20.0)	7 (23.3)	
Sex			
Male	13 (43.3)	13 (43.3)	0.00 (1.00)
Female	17 (56.7)	17 (56.7)	
Education			
Literate	6 (20.0)	8 (26.7)	2.26 (0.81)
Illiterate	24 (80)	22 (73.3)	

χ^2 , Chi-square test. *Statistically significant at $p \leq 0.05$.

Table 2. Comparison between the groups regarding patient satisfaction with NCBs during ICU admission and orientation processes.

Nurse caring behaviors during admission and orientation processes	Protocol group (n = 30)		Control group (n = 30)		Significance test t (p)
	Satisfied	Dissatisfied	Satisfied	Dissatisfied	
Nurses welcoming and identify themselves to the patients.	30 (100)	0 (0.0)	5 (16.7)	25 (83.3)	15.3 (0.00) *
Orientation provided by the nurse regarding time, place, and person.	25 (83.3)	5 (16.7)	5 (16.7)	25 (83.3)	8.1 (0.00) *
Orientation provided by the nurse regarding nursing activities that will be done.	25 (83.3)	5 (16.7)	5 (16.7)	25 (83.3)	8.1 (0.00) *
Informing the patient to call if problems arise.	30 (100)	0 (0.0)	13 (43.3)	17 (56.7)	6.6 (0.00) *
Orientation provided by the nurse regarding reasons for alarms and other disturbing and unpleasant sounds.	25 (83.3)	5 (16.7)	13 (43.3)	17 (56.7)	5.9 (0.00) *
Orientation provided by the nurse regarding surrounded environment.	30 (100)	0 (0.0)	13 (43.3)	17 (56.7)	11.0 (0.00) *
Orientation provided by the nurse regarding the expected length of stay at the intensive care unit.	30 (100)	0 (0.0)	5 (16.7)	25 (83.3)	26.5 (0.00) *
The explanation provided by the nurse regarding the lines, tubes, and devices attached to the patient.	30 (100)	0 (0.0)	13 (43.3)	17 (56.7)	12.2 (0.00) *
Feasibility of communication with nurses.	30 (100)	0 (0.0)	0 (0.0)	30 (100)	4.7 (0.00) *

ICU, intensive care unit; NCBs, nurse caring behaviors. * Statistically significant at $P < 0.05$

Table 3. Comparison between the groups regarding patient satisfaction with NCBs during physical, psychological, and social care

Nurse caring behaviors during physical, psychological, and social care	Protocol group (n = 30)		Control group (n = 30)		Significance test t (p)
	Satisfied	Dissatisfied	Satisfied	Dissatisfied	
Physical care					
The manner in which nurses talk to patients	12 (40)	18 (60)	5 (16.7)	25 (83.3)	6.4 (0.00) *
The ability of nurses to establish realistic goals	30 (100)	0 (0.0)	13 (43.3)	17 (56.7)	4.2 (0.00) *
Responding to patient complaints.	25 (83.3)	5 (16.7)	13 (43.3)	17 (56.7)	5.3 (0.00) *
Nurse's helpfulness	25 (83.3)	5 (16.7)	8 (26.7)	22 (73.3)	4.7 (0.00) *
Nurses' availability	25 (83.3)	5 (16.7)	0 (0.0)	30 (100)	9.7 (0.00) *
Praising the patients for performing activities.	25 (83.3)	5 (16.7)	5 (16.7)	25 (83.3)	12.0 (0.00) *
Highlighting the progress of the patient's condition.	30 (100)	0 (0.0)	5 (16.7)	25 (83.3)	2.4 (0.02) *
Nurses' capability	25 (83.3)	5 (16.7)	0 (0.0)	30 (100)	12.0 (0.00) *
Psychological care					
Dealing with patients and providing enthusiasm	30 (100)	0 (0.0)	5 (16.7)	25 (83.3)	2.8 (0.08)
Level of confidentiality that nurses provided to patients.	30 (100)	0 (0.0)	13 (43.3)	17 (56.7)	12.2 (0.00) *
Always repeating statements that instilled hope.	30 (100)	0 (0.0)	0 (0.0)	30 (100)	12.0 (0.00) *
Social interaction					
Duration of time nurses' spent with patients.	30 (100)	0 (0.0)	0 (0.0)	30 (100)	2.8 (0.01) *
Maintaining a cheerful disposition.	25 (83.3)	5 (16.7)	0 (0.0)	30 (100)	9.9 (0.00) *
Making patients feel at home	30 (100)	0 (0.0)	13 (43.3)	17 (56.7)	8.7 (0.00) *
Nurse's ability to provide verbal reassurance	25 (83.3)	5 (16.7)	8 (26.7)	22 (73.3)	6.5 (0.00) *
Nurse's ability to use the eye-to-eye contact with the patient.	25 (83.3)	5 (16.7)	8 (26.7)	22 (73.3)	15.3 (0.00) *

ICU, intensive care unit; NCBs, nurse caring behaviors. *Statistically significant at $p < 0.05$.

Table 4. Comparison between the groups regarding patient satisfaction with NCBs during health teaching.

Nurse caring behaviors during health teaching	Protocol group (n = 30)		Control group (n = 30)		Significance test t (p)
	Satisfied	Dissatisfied	Satisfied	Dissatisfied	
Information provided by the nurse regarding diagnosis, your rights, and treatment plan.	25 (83.3)	5 (16.7)	13 (43.3)	17 (56.7)	7.0 (0.00) *
Information provided by the nurse regarding postoperative activity.	30 (100)	0 (0.0)	13 (43.3)	17 (56.7)	4.3 (0.00) *
Information provided by the nurse regarding diagnostic procedures	25 (83.3)	5 (16.7)	13 (43.3)	17 (56.7)	6.4 (0.00) *
Feasibility and clearness of the information provided by the nurse.	30 (100)	0 (0.0)	13 (43.3)	17 (56.7)	9.9 (0.00) *
Time at which the nurse provided information was enough and suitable for the patient.	30 (100)	0 (0.0)	13 (43.3)	17 (56.7)	6.4 (0.00) *

ICU, intensive care unit; NCBs, nurse caring behaviors; t, Student t-test. *Statistically significant at $p < 0.05$

Table 5. Comparison between the groups regarding patient satisfaction with NCBs during maintaining a safe healing environment.

Nurse caring behaviors during maintaining a safe healing environment	Protocol group (n = 30)		Control group (n = 30)		Significance test t (p)
	Satisfied	Dissatisfied	Satisfied	Dissatisfied	
Availability of comfort measures, such as lighting, noise control, and adequate blankets.	30 (100)	0 (0.0)	13 (43.3)	17 (56.7)	1.0 (0.00) *
Cleanliness and ventilation of the intensive care unit.	30 (100)	0 (0.0)	7 (23.3)	23 (76.7)	9.9 (0.00) *
Adequacy of sleeping time	30 (100)	0 (0.0)	13 (43.3)	17 (56.7)	4.9 (0.00) *
Keeping patients away from unpleasant scenes	30 (100)	0 (0.0)	5 (16.7)	25 (83.3)	12.0 (0.00) *
Availability glasses, hearing aids, and familiar objects	30 (100)	0 (0.0)	0 (0.0)	30 (100)	4.2 (0.00) *

ICU, intensive care unit; NCBs, nurse caring behaviors. *Statistically significant at $p < 0.05$

Discussion

The current study found that the protocol group was significantly satisfied with NCBs during the ICU admission and orientation process compared to the control group. These results could be explained by the fact that orienting critically ill patients reduces anxiety induced by hospitalization, unfamiliar environment, loss of control, and separation from family members. The majority of patients in the protocol group were satisfied with the orientation provided on the causes of alarms and other disturbing and unpleasant sounds. Patients' orientation decreased anxiety and stress levels while increasing cooperation and satisfaction. These results are consistent with Mariana et al.(2020) who assessed the effects of hospital service quality on patient satisfaction and revealed that the majority of the respondents strongly agreed that service quality promotes patient satisfaction. Karimi et al. (2015) investigated the effects of the orientation program on patient satisfaction among patients with coronary artery disease and discovered that the orientation program was beneficial in improving patient

satisfaction. Moreover, Suprajitno et al.(2020) discovered a link between patient orientation and satisfaction. Samimi et al.(2021) observed a statistically significant association between patient satisfaction and a coordinated admission process.

The current study showed that the protocol group was satisfied with the feasibility of communicating with nurses. This result could be explained by the fact that the high level of interaction provided by nurses will undoubtedly improve confidence between patients and nurses. This is consistent with Hayran and Özer(2018) who found that good communication skills among medical staff were the key source of patient satisfaction.

The results of the current study revealed that the protocol group was more satisfied with NCBs during physical care. These results could be attributed to nurses providing better care, resulting in shorter hospitalization. Patient satisfaction increased after providing holistic nursing care that focused on both the physical and non-physical aspects of the patient, as well as enhancing patient engagement in interaction

with health care providers. Moreover, patient satisfaction improved after providing continuous education and guidance regarding breathing regulation, as well as setting realistic goals, such as endotracheal tube removal. These results are consistent with the findings presented in Lucadamo et al.(2021) who studied the impact of advanced nursing practice on the quality of care and patient satisfaction. They revealed that advanced evidence-based practice nursing improved patient satisfaction. Furthermore, Samant et al.(2021) and Lichen et al. (2021), who assessed the relationship between nursing care and patient satisfaction, showed a strong relationship between the nursing care delivered and patient satisfaction. Additionally, Karaca and Durna (2019) concluded that patients were more satisfied with nurses' attention and care.

The current results indicated that the protocol group expressed more satisfaction with NCBs during psychological care compared to the control group. Psychological care is a vital part of patient care given that the critical nature of postoperative cardiac surgery increases patients' vulnerability to psychological stress and anxiety, which can worsen the patient's physiological condition. O'Toole et al.(2019) showed that psychological disturbance risk factors are regarded as impediments to improving physical health. Li & Zhang (2020) revealed that nurses perceive that psychological behaviors are particularly significant for patients with coronary artery diseases. Moreover, Karaca and Durna (2019) demonstrated that nurses played a vital role in providing psychological care to patients in critical situations. Goh(2016) revealed that nurses should provide both technical and psychosocial care to patients. Kol et al.(2018) confirmed that majority of patients were highly satisfied with the psychological support provided by nurses, which comprised respect, smiling, and care.

The results of the current study demonstrated that the protocol group showed more satisfaction with NCBs during social interaction compared to the control group. These results could be attributed to that the fact that an NCB protocol improves communication between patients and nurses, promoting better patient satisfaction. These results are in

agreement with Rajabpour and Rayyani(2019) who found a significant positive correlation between patients' perception of holistic care and overall satisfaction with nursing care. Lotfi(2019) assessed professional nurse-patient communication and showed a correlation between nurse-patient communication and patient satisfaction with nursing care. Rôlo et al.(2019) found that receiving adequate nursing care increased patient satisfaction.

In the current study, the control group demonstrated that nurses made them feel as if they were wasting nurses' time. This could have been caused by nursing overwork, a decreased in the nurse-patient ratio in the ICU, communication barriers, and the busy work environment in the ICU, all of which contradict the ethical practices in the implementation of nursing care (Karaca & Durna, 2019).

The current results indicated that the protocol group was more satisfied with the NCBs when receiving health teaching compared to the control group. These results could be explained by the fact that providing health teaching helps ensure and maximize patients' knowledge while facilitating patient engagement with nursing care activities. These results are consistent with those reported in Breda & Cerejo (2021) who showed that health education can enhance patient satisfaction. Furthermore, Chiu et al.(2021) and Goodman et al. (2021) who examined the effect of educational programs on patient satisfaction concluded that the experimental group was more satisfied with the educational program delivered. Additionally, Piotrkowska et al.(2021) revealed that continued health teaching increased patient satisfaction.

The majority of patients in the control group were dissatisfied with the feasibility and clarity of the information provided. This could have been due to nurses' failure to adhere to ethical principles by being insensitive to patients' cultures, which hinders understanding of information and promotes patient dissatisfaction(Darnell LK, 2015).

Most of the patients in the NCBs protocol group of the present study were satisfied with the information provided regarding their diagnosis, their rights, and their treatment plan. These results are consistent with Kol et al.

(2018) who showed that establishing excellent communication and providing information regarding the nursing care provided are primary pathways toward patient satisfaction.

The current results revealed that compared to the control group, the protocol group was more satisfied with NCBs while maintaining a safe healing environment. A healing environment can be defined as a safe, clean, calm, well-designed, and private space that is free of stressors, which can be achieved by reducing noise, responding quickly to alarms, and avoiding unpleasant sights while attending to newly admitted critical or emergency patients. The current results are consistent with those provided in Brooks Carthon et al. (2021) who found that ICU designs that match the patients' needs, provided privacy, had quiet surroundings, prevented infection, and had open visiting hours increased patient satisfaction. Furthermore, Sarkar et al. (2021) found that a healthy hospital environment had a progressive influence on nursing care, improved patients' clinical outcomes and, consequently, increased patient satisfaction. On the other hand, the results of the current study contradict that reported by MacAllister et al. (2016) who demonstrated that while a clean and quiet physical environment is important, it was not considered a critical part of patient satisfaction.

The current results found a statistically significant difference between the protocol and control groups related to NCBs. These results could be attributed to that caring is the foundation and heart of nursing care. These caring behaviors cause nurses to comprehend and be able to aid patients both medically and mentally. NCBs guide nursing care toward offering spiritual and educational support to patients. These results are consistent with those reported by Folami (2019) who discovered a significant relationship between patients' perceived quality of health care and patient satisfaction. Tsai et al. (2015) revealed that patient satisfaction increased when nurses underwent a care workshop on NCBs. Boz and Kol (2020) showed that ICU nurses should provide holistic care to critically ill patients by maintaining a balance between NCBs and advanced technologies. Calong and Soriano

(2018) demonstrated a significant relationship between patient satisfaction and caring behaviors provided.

Conclusion

The current study concluded that implementing a NCB protocol during nursing care involving ICU orientation, physical, psychological, and social behaviors, health teaching, and maintaining a safe healing environment improved postoperative cardiac patient satisfaction.

Recommendations

To gain postoperative cardiac patient satisfaction, this study raises awareness among CCNs regarding the necessity of applying NCBs in the postoperative care of cardiac patients. In addition, hospital managers should arrange and encourage CCNs to attend workshops on NCBs to broaden their knowledge and further clarify their roles in nursing care. Furthermore, a NCB protocol should be incorporated into undergraduate curricula. Further studies are recommended to assess factors affecting nurse caring behaviors.

Limitation of the study

We were unable to continue implementing the NCB protocol for more than 2 days after surgery considering that patients left the cardiac surgery ICU after 2 days according to hospital policy.

Financial support

No funding was received

References

- Akansel, N., Watson, R., Vatansever, N., & Özdemir, A. (2021). Nurses' perceptions of caring activities in nursing. *Nursing Open*, 8(1), 506–516. <https://doi.org/10.1002/nop2.653>
- Akgün, M., Kavradim, S. T., Boz, İ., & Özer, Z. (2020). Development and psychometric properties of the Caring Behaviors Assessment Tool Nursing Version-Short Form. *International Journal for Quality in Health Care*, 32(10), 701–707. <https://doi.org/10.1093/intqhc/mzaa134>

- Aty, Y. M. V. B., Herwanti, E., Mau, A., Ayatullah, M. I., & Asriwardani, F. (2020). Factors Affecting Nurse Caring Behavior. *JURNAL INFO KESEHATAN*, 18(2). <https://doi.org/10.31965/infokes.vol18.iss2.396>
- Bagnasco, A., Dasso, N., Rossi, S., Galanti, C., Varone, G., Catania, G., Zanini, M., Aleo, G., Watson, R., Hayter, M., & Sasso, L. (2020). Unmet nursing care needs on medical and surgical wards: A scoping review of patients' perspectives. In *Journal of Clinical Nursing* (Vol. 29, Issues 3–4, pp. 347–369). <https://doi.org/10.1111/jocn.15089>
- Bijani, M., Ghodsbin, F., Javanmardi Fard, S., Shirazi, F., Sharif, F., & Tehranineshat, B. (2017). An evaluation of adherence to ethical codes among nurses and nursing students. *Journal of Medical Ethics and History of Medicine*, 10, 6. <http://www.ncbi.nlm.nih.gov/pubmed/29291039>
- Boz, İ., & Kol, E. (2020). Yoğun Bakım Hemşireliğinde Bakım Davranışları Üzerine Bir Literatür Derleme a Literature Review on Caring Behaviors in Intensive Care Nursing. *Yoğun Bakım Hemşireliği Dergisi*, 24(1), 32–38.
- Breda, L., & Cerejo, M. (2021). Influência da consulta pré-operatória de enfermagem na satisfação das necessidades informativas do doente. *Revista de Enfermagem Referência, V Série*(Nº5). <https://doi.org/10.12707/RV20088>
- Brooks Carthon, J. M., Hatfield, L., Brom, H., Houton, M., Kelly-Hellyer, E., Schlak, A., & Aiken, L. H. (2021). System-level improvements in work environments lead to lower nurse burnout and higher patient satisfaction. *Journal of Nursing Care Quality*, 36(1), 7–13. <https://doi.org/10.1097/NCQ.00000000000000475>
- Calong, K. A. C., & Soriano, G. P. (2018). Caring Behavior and Patient Satisfaction: Merging for Satisfaction. *International Journal of Caring Sciences*, 11(2), 697–703. http://www.internationaljournalofcaringsciences.org/docs/9_1-soriano_original_10_2.pdf
- Chaboyer, W., Harbeck, E., Lee, B. O., & Grealish, L. (2021). Missed nursing care: An overview of reviews. In *Kaohsiung Journal of Medical Sciences* (Vol. 37, Issue 2, pp. 82–91). <https://doi.org/10.1002/kjm2.12308>
- Chiu, H.-H., Cheng, H.-J., Wang, H.-H., Hsu, H.-F., Lee, C.-Y., Chang, H.-Di, & Huang, H.-C. (2021). A Comparison of the Effectiveness of Share Decision Making and Standard Education for Cardiac Catheterization: A Pilot Study. *International Journal of Studies in Nursing*, 6(1), 1. <https://doi.org/10.20849/ijsn.v6i1.834>
- Darnell LK, H. S. (2015). *Cultural competent patient-centered nursing care*. 50(1), 99–108.
- Davoodi, A., Azarsa, T., Shahbazpour, M., Sokhanvar, Z., & Ghahramanian, A. (2020). Relationship between quality of work life and caring behaviors among emergency nurses. *International Journal of Workplace Health Management*, 13(6), 687–701. <https://doi.org/10.1108/IJWHM-11-2019-0151>
- Desborough, J., Bagheri, N., Banfield, M., Mills, J., Phillips, C., & Korda, R. (2016). The impact of general practice nursing care on patient satisfaction and enablement in Australia: A mixed methods study. *International Journal of Nursing Studies*, 64, 108–119. <https://doi.org/10.1016/j.ijnurstu.2016.10.004>
- Folami, F. (2019). Assessment of Patient Satisfaction with Nursing Care in Selected Wards of the Lagos University Teaching Hospital (Luth). *Biomedical Journal of Scientific & Technical Research*, 17(1), 12489–79. <https://doi.org/10.26717/bjstr.2019.17.002941>
- Goh, M. L., Ang, E. N. K., Chan, Y. H., He, H. G., & Vehviläinen-Julkunen, K. (2016).

- A descriptive quantitative study on multi-ethnic patient satisfaction with nursing care measured by the Revised Humane Caring Scale. *Applied Nursing Research*, 31, 126–131. <https://doi.org/10.1016/j.apnr.2016.02.002>
- Goodman, K. J., Dougan, B. M., Stevens, D. M., Smith, J. R., Mikhail, M. A., & Majka, A. J. (2021). Introducing nurse-led patient education visits: Empowering patients and elevating nursing practice. *Journal of Nursing Care Quality*, 36(1), 43–49. <https://doi.org/10.1097/NCQ.00000000000000489>
- Hayran, O., & Özer, O. (2018). Organizational health literacy as a determinant of patient satisfaction. *Public Health*, 163, 20–26. <https://doi.org/10.1016/j.puhe.2018.06.011>
- Izadi, F., Bijani, M., Fereidouni, Z., Karimi, S., Tehranineshat, B., & Dehghan, A. (2020). The Effectiveness of Teaching Nursing Ethics via Scenarios and Group Discussion in Nurses' Adherence to Ethical Codes and Patients' Satisfaction with Nurses' Performance. *The Scientific World Journal*, 2020, 1–7. <https://doi.org/10.1155/2020/5749687>
- Juujärvi, S., Ronkainen, K., & Silvennoinen, P. (2019). The ethics of care and justice in primary nursing of older patients. *Clinical Ethics*, 14(4), 187–194. <https://doi.org/10.1177/1477750919876250>
- Karaca, A., & Durna, Z. (2019). Patient satisfaction with the quality of nursing care. *Nursing Open*, 6(2), 535–545. <https://doi.org/10.1002/nop2.237>
- Karimi, V., Hanifi, N., Bahraminejad, N., & Faghihzadeh, S. (2015). The effects of the family-centered orientation program on satisfaction with healthcare services among patients with coronary artery disease. *Iran J Crit Care Nurs*, 8(3), 143–8.
- Kibret, H., Tadesse, B., Debella, A., Degefa, M., & Regassa, L. D. (2022). The Association of Nurses Caring Behavior with the Level of Patient Satisfaction, Harari Region, Eastern Ethiopia. *Nursing: Research and Reviews*, Volume 12. <https://doi.org/10.2147/nrr.s345901>
- Klarare, A., Söderlund, M., Wikman, A., McGreevy, J., Mattsson, E., & Rosenblad, A. (2021). Caring Behaviors Inventory-24: translation, cross-cultural adaptation and psychometric testing for use in a Swedish context. *Human Resources for Health*, 19(1), 11. <https://doi.org/10.1186/s12960-020-00540-5>
- Kol, E., Arıkan, F., İlaslan, E., Akıncı, M. A., & Koçak, M. C. (2018). A quality indicator for the evaluation of nursing care: determination of patient satisfaction and related factors at a university hospital in the Mediterranean Region in Turkey. *Collegian*, 25(1), 51–56. <https://doi.org/10.1016/j.colegn.2017.03.006>
- Li C; Zhang J. (2020). Effect of personalized care on stress response and quality of life in patients with coronary heart disease after PCI. *International Journal of Clinical and Experimental Medicine*, 13(2), 884–892. <http://www.ijcem.com/files/ijcem0103984.pdf%0Ahttp://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed21&NEWS=N&AN=2003914133>
- Lichen, I. M., Berning, M. J., Bower, S. M., Stanich, J. A., Jeffery, M. M., Campbell, R. L., Walker, L. E., & Bellolio, F. (2021). Non-pharmacologic interventions improve comfort and experience among older adults in the Emergency Department. *American Journal of Emergency Medicine*, 39, 15–20. <https://doi.org/10.1016/j.ajem.2020.04.089>
- Lotfi, M., Zamanzadeh, V., Valizadeh, L., & Khajehgoodari, M. (2019). Assessment of nurse–patient communication and patient satisfaction from nursing care. *Nursing Open*, 6(3), 1189–1196. <https://doi.org/10.1002/nop2.316>
- Lucadamo, A., Camminatiello, I., & D'Ambra,

- A. (2021). A statistical model for evaluating the patient satisfaction. *Socio-Economic Planning Sciences*, 73, 100797. <https://doi.org/10.1016/j.seps.2020.100797>
- Lukmanulhakim, L., Afriyani, A., & Haryani, A. (2019). Caring Efficacy and Nurse Caring Behavior in Taking Care of Critical Patients. *Jurnal Ners*, 14(1). <https://doi.org/10.20473/jn.v14i1.9664>
- MacAllister, L., Zimring, C., & Ryherd, E. (2016). Environmental Variables That Influence Patient Satisfaction: A Review of the Literature. *Health Environments Research and Design Journal*, 10(1), 155–169. <https://doi.org/10.1177/1937586716660825>
- Mariana, E., Apriyani, W., & Supriyanto, S. (2020). Analysis of perceived health care quality on patient satisfaction. *EurAsian Journal of BioSciences*, 14(2), 2703–2708.
- Meadows, K., Gibbens, R., Gerrard, C., & Vuylsteke, A. (2018). Prediction of Patient Length of Stay on the Intensive Care Unit Following Cardiac Surgery: A Logistic Regression Analysis Based on the Cardiac Operative Mortality Risk Calculator, EuroSCORE. *Journal of Cardiothoracic and Vascular Anesthesia*, 32(6), 2676–2682. <https://doi.org/10.1053/j.jvca.2018.03.007>
- Molalign Takele, G., Abreha Weldesenbet, N., Girmay, N., Degefe, H., & Kinfe, R. (2021). Assessment patient satisfaction towards emergency medical care and its determinants at Ayder comprehensive specialized hospital, Mekelle, Northern Ethiopia. *PloS One*, 16(1). <https://doi.org/10.1371/journal.pone.0243764>
- O'Toole, J., Ingram, S., Kelly, N., Quirke, M. B., Roberts, A., & O'Brien, F. (2019). Patient Satisfaction With Innovative Nurse Practitioner Cardiology Services. *Journal for Nurse Practitioners*, 15(4), 311–315.e1. <https://doi.org/10.1016/j.nurpra.2018.12.013>
- Oswal, K., Kanodia, R., Nadkar, U., Kharodia, N., Avhad, M., Venkataramanan, R., Sethuraman, L., Caduff, C., & Purushotham, A. (2021). Cancer patients' experience of oncology services in Assam, India. *Journal of Cancer Policy*, 27, 100267. <https://doi.org/10.1016/j.jcpc.2020.100267>
- Owaidh, A. O., Atiah, A. A., Abadi, A. S., Ali, A. M., Abdullah, A. M., Abdullah, A. A., & Hassan, A. M. (2018). Patients Satisfaction with Health Care Services in Southern Saudi Arabia. *The Egyptian Journal of Hospital Medicine*, 72(July), 3857–3860.
- ÖZŞAKER, E., SEVİLMİŞ, H., ÖZCAN, Y., & SAMAST, M. (2021). Nursing Care Perception and Satisfaction Levels of Surgical Patients. *Journal of Contemporary Medicine*, 11(1), 1–9. <https://doi.org/10.16899/jcm.711131>
- Piotrkowska, R., Terech-Skóra, S., Mędrzycka-Dąbrowska, W., Jarzynkowski, P., & Król, M. (2021). Factors determining acceptance of disease and its impact on satisfaction with life of patients with peripheral artery disease. *Nursing Open*, 8(3), 1417–1423. <https://doi.org/10.1002/nop2.758>
- Rajabpour, S., Rayyani, M., & Mangolian Shahrabaki, P. (2019). The relationship between Iranian patients' perception of holistic care and satisfaction with nursing care. *BMC Nursing*, 18(1), 1–17. <https://doi.org/10.1186/s12912-019-0374-7>
- Rôlo, B., Santos, B., Duarte, I., Pires, L., & Castro, C. (2019). Humanization of nursing care in the emergency service: a systematic review. *Annals of Medicine*, 51(sup1), 204–204. <https://doi.org/10.1080/07853890.2018.1560164>
- Salimi, S., & Tarbiat, S. (2021). Predictors and priority of caring behaviours in intensive care units. *Nursing in Critical Care*.

<https://doi.org/10.1111/nicc.12590>

Samant, R., Cisa-Paré, E., Balchin, K., Renaud, J., Bunch, L., Wheatley-Price, P., McNeil, A., Murray, S., & Meng, J. (2021). Assessment of Patient Satisfaction Among Cancer Patients Undergoing Radiotherapy. *Journal of Cancer Education*.
<https://doi.org/10.1007/s13187-020-01950-8>

Samimi, M., Safaie, A., Sotoodehnia, M., Rasooli, F., & Abdollahi, A. (2021). The impact of the coordinating nurse role on patient satisfaction in the emergency department: A semi-experimental study. *Journal of Emergency Practice and Trauma*, 7(1), 22–27.
<https://doi.org/10.34172/JEPT.2020.31>

Sarkar, M., Rock, P., Rowen, L., & Hong, C. (2021). Increased Patient Satisfaction in the Postanesthesia Care Unit with the Implementation of a Controlled Noise Reduction Program. *Journal of Perianesthesia Nursing*, 36(1), 3–7.
<https://doi.org/10.1016/j.jopan.2020.05.001>

Suparman Rustam, J., Kongsuwan, W., & Kitrungrate, L. (2018). Comfort in Patients Receiving Mechanical Ventilation: A Literature Review. *Critical Care Nursing*, 11(2).
<https://doi.org/10.5812/ccn.64159>

Suprajitno, S., Sari, Y. K., & Anggraeni, E. N. B. (2020). Relationship of Nurse Caring Behaviour with Patient Satisfaction at the Emergency Department of Catholic Hospital of Budi Rahayu Blitar. *Jurnal Ners Dan Kebidanan (Journal of Ners and Midwifery)*, 7(1), 001–005.
<https://doi.org/10.26699/jnk.v7i1.ART.p001-005>

Tsai, Y.-C., Wang, Y.-H., Chen, L.-M., & Chou, L.-N. (2015). Effects of a care workshop on caring behavior and job involvement of nurses. *Journal of Nursing Education and Practice*, 5(8), 7.
<https://doi.org/10.5430/jnep.v5n8p1>