

A comparison of the intensive care experiences of emergency and elective cardiac surgery patients

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Abstract

Purpose: The study was planned to review the experiences of patients in the intensive care units (ICUs) and determine their states of awareness following an emergency or elective cardiac surgery.

Materials and Methods: This was a multicenter and descriptive study. Approval was granted by the Institutional Ethics Committee and informed consent for participation in the study was obtained from all the patients. The study included a total of 300 patients who underwent emergency or elective cardiovascular surgery and were then transferred to the ICU. Data were gathered from the demographic data form and the intensive care experience scale, which was developed by the researchers and applied through face-to-face interviews with the patients. The independent-samples *t*-test, Mann–Whitney U (Exact) test, one-way ANOVA (Robust Test: Brown–Forsythe), and multivariate analysis of variance were used in the analysis of the data.

Results: The study included 300 patients, comprising 108 (36%) females and 192 (64%) males. No difference was found between the groups in respect of total intensive care points of emergency (57.9 ± 4.92) and elective (56.6 ± 4.58) operations ($P = 0.32$). The environmental awareness level and patient satisfaction of the elective group were seen to be higher, and the emergency group reported more bad experiences. Patients who had undergone emergency cardiac valve surgery were more satisfied ($P < 0.001$) and remembered more ($P = 0.001$).

Conclusion: Patients who had undergone urgent and elective cardiac surgery were seen to have had a relatively negative intensive care experience. When there was more environment awareness in patients with ICU experience, it was determined that as the duration of stay in the ICU lengthens out, the pessimistic experiences increased and ICU satisfaction decreases.

Key words: Cardiac surgery, intensive care experiences, intensive care experience scale

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Introduction

Rapid developments in cardiovascular surgery in recent years have enabled the development of intensive care experiences and quality in this field has increased. The

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emotional status of the patients and the establishment of good communication with patients is just as important as a good, professional surgical team and postoperative care.^[1] In particular patients, who cannot speak when receiving mechanical ventilation support cannot share their thoughts, feelings and needs and therefore, the establishing of communication with the nurses who are caring for them is of vital importance.^[2] It is known that intensive care units (ICUs) may be disturbing places for patients, and they may have some negative experiences during their stay in such places.^[3,4] Not seeing family or friends, the feeling of dependence on the ICU, insufficient explanation of treatments, and the noise of equipment in the ICU all affect patients negatively.^[5,6] Interventions made without their knowledge and pain and suffering arising from these interventions upset patients.^[5-7] Painful procedures made on patients with an intense fear of death and the noise of machines and employees result in physical and psychological problems, known as “ICU syndrome.” Agitation and orientation disorders in these patients appear as hallucinations and sleep problems^[8-10] and sometimes, depression may be seen as a result of a stay in the ICU. Varying degrees of depression and anxiety may adversely affect the patient’s healing process.^[11,12] Physiological and psychological disadvantages during this period can affect healing adversely. To prevent such problems, bad experiences of patients during an ICU stay must be identified, and the corrective steps must be taken.^[13] Reliable and valid standard measurement tools to be used by professional healthcare staff are needed to objectively evaluate the experiences of the patients in ICUs. The “intensive care experience scale” (ICES) developed by Rattay *et al.* is one of the tools used for this purpose, which has been tested for validity and reliability in Turkey by Demir *et al.*^[3-5]

The study is intended to identify the intensive care experiences after an emergency and elective cardiac surgery. The findings from this study may be helpful to caregivers in the ICU in improving on the existing level of patient care.

Materials and Methods

The study was designed as descriptive, prospective and multicentric. A total of 300 patients (108 females and 192 males) were included, who had undergone emergency or elective surgery in the Cardiovascular surgery Departments of two Universities between February 2014 and December 2014 [Table 1]. Co-operative cardiac valve surgery and coronary bypass patients who were extubated within the first 24 h and stayed in the ICU for a maximum of 4 days were enrolled in the study. Unco-operative patients with a poor general condition, who underwent major vascular surgery, stayed in the ICU for more than 4 days and were not extubated within 24 h, were excluded from the study.

The demographic characteristics of the patients participating in the study were identified with the “Patient Assessment Form” prepared by the researchers according to literature. In addition, the ICES consisting of 19 items to evaluate the intensive care experience was completed via face-to-face interviews. Responses to 9 items of the ICES in respect of adaptation to intensive care were given on a 5 points Likert scale where 1 = I absolutely agree (1-point) and 5 = I strongly disagree (5 points). For the 10 items of ICES referring to the emotional status of the patient, responses were from 1 = always (1-point) to 5 = Never (5 points). The total score range of the scale is 19–95. Low scores on the scale were interpreted as the patient being unconscious, and the experience of the ICU was negative. Higher scores indicated that the patient had a high level of consciousness and the experience in the ICU was positive. Intensive care experiences were categorized by Demir under four-dimensions as being aware of the environment during the ICU stay (questions 1–6, 6–30 points), bad experiences encountered (questions 7–10, 4–20 points), remembering the experiences in the ICU (questions 15–19, 5–25 points), and satisfaction with the care in the ICU (questions 11–14, 4–20 points) [Table 2].

The patients were separated into two main groups as those who had a bypass or cardiac valve surgery and were further subdivided according to emergency or elective surgery. All the data related to gender, length of stay in the ICU, previous experience of ICU stay and the other parameters in ICES were compared between these four groups [Table 3].

Statistical methods

All data analyses were made using SPSS 22.0 (IBM statistics for Windows version 22, IBM Corporation, Armonk, New York, United States) program. The conformity of data to normal distribution was analyzed by applying the Shapiro–Wilk test and Variation coefficients. Parametric methods were used in the analysis of the variables with normal distribution, and nonparametric methods were used in the analysis of the variables without normal distribution. The independent samples *t*-test and the Mann–Whitney *U*-test (exact) were used in the comparison of two independent groups, and one-way ANOVA (Robust Test: Brown-Forsythe) was used for the comparison of multiple groups, with least significant difference and Games–Howell tests used for *post-hoc* analyses. While multivariate analysis of variance was used for the comparison of two independent variables with dependent groups, the Bonferroni test was used for *post-hoc* analyses. Internal consistency and item analysis approaches were used for the reliability analysis in the study. Internal consistency was shown with the Cronbach alpha value. Quantitative data were shown as the mean \pm standard deviation, median \pm interquartile range and median range (maximum–minimum) in the tables. Categorical data were stated as number and percentage.

Data were analyzed at 95% of confidence level and a value of $P < 0.05$ was accepted as statistically significant.

Sample size

The study included a total of 300 cases, as 297 subjects with +3 alternates, for a representative sample in this cross-sectional study where the mass was accepted as 1300 subjects at 95% power and 5% sampling error. It was determined that the item total score correlation of the scale varied between 0.30 and 0.68 and the Cronbach Alpha coefficient was 0.79. The validity and reliability of the Turkish form of ICES had been previously tested by Demir *et al.*^[5] who stated the item total score correlations of the scale between 0.30 and 0.68 and the Cronbach Alpha value, which shows the internal consistency coefficient, at 0.79. In literature, it is recommended that the acceptable correlation coefficient is higher than 0.20 in an item selection.^[14] In many previous studies, it has been stated that the Cronbach alpha coefficient of measurement tools should be at least 0.50. Accordingly, while the item total score correlations of the data collected from the sample in this study ranged between 0.25 and 0.71, the Cronbach alpha value, showing the internal consistency coefficient was 0.71 for the subscale of environmental awareness, 0.69 for the subscale of bad experiences encountered, 0.78 for the subscale of remembering intensive care experiences and 0.67 for the subscale of intensive care satisfaction.

Results

The study included a total of 300 patients comprising 108 (36%) females and 192 (64%) males, with a mean age of 61.1 ± 9.76 years [Table 1]. The demographic characteristics of the patients are given in Table 1.

Surgery was emergency in 96 (32%) patients and elective in 204 (68%). When the total intensive care scores of the emergency and elective operations were compared, the average scores were 57.9 ± 4.92 in the emergency group and 56.6 ± 4.58 in the elective group, with no difference found between the groups ($P = 0.32$). Higher scores of environmental awareness ($P < 0.001$) and satisfaction of the patients were determined in the elective group. Bad experiences were determined at a higher rate in the emergency group ($P < 0.001$) [Table 3].

Cardiac valve surgery was performed on 78 (26%) patients and bypass surgery on 222 (74%). The total intensive care scores of the patients who underwent cardiac valve surgery were 57.8 ± 4.2 in the emergency group and 54.6 ± 4.07 for the elective cardiac valve surgery group. A significant difference was determined between the emergency and elective cardiac valve surgery groups ($P = 0.03$).

Table 1: Demographic characteristics of the patients

Variables	Data
Age (years)	$61.1 \pm 9.76^*/61.5$ (77-36)**
Gender [†]	
Female/male	108 (36)/192 (64)
Education [†]	
Illiterate/literate	24 (8)/60 (20)
Primary/secondary education	150 (50)/66 (22)
Marital status [†]	
Married/single	240 (80)/60 (20)
Number of children (n)	$2.7 \pm 1.13^*/3$ (5-1)**
Family type [†]	
Large family/core family	18 (6)/282 (94)
Income-expenses [†]	
Compensate/not compensate	192 (64)/108 (36)
Intensive care experience [†]	
Yes/no	30 (10)/270 (90)
ICU stay duration (days)	$2.6 \pm 0.61^*/2.5$ (4-2)**
State of operation [†]	
Emergency/elective	96 (32)/204 (68)
Type of operation [†]	
Cardiac valve surgery/bypass	78 (26)/222 (74)

[†]n (%); *Mean \pm SD; **Median range (maximum-minimum). SD=Standard deviation; ICU=Intensive care unit

Table 2: ICU experience scale

Patient's adaptation to the intensive care (1-9 th questions)
Strongly agree (1-point)
Agree (2 points)
Neutral (3 points)
Disagree (4 points)
Strongly disagree (5 points)
Determining the emotional state of the patient (10 th 19 th questions)
Always (1-point)
Frequently (2 points)
Sometimes (3 points)
Seldom (4 points)
Never (5 points)

ICU=Intensive care unit

Those who underwent emergency surgery remembered more ($P = 0.001$) and were more satisfied than patients in the elective group ($P < 0.001$) [Table 4].

In the comparison of the patients who underwent emergency or elective bypass surgery, the intensive care satisfaction ($13.8 \pm 2.09/13.0 \pm 1.98$) and the bad experiences encountered ($14.4 \pm 2.25/13.0 \pm 1.87$) scores were found to be higher in the emergency group. The score of environmental awareness in the ICU ($16.8 \pm 2.14/18.2 \pm 2.21$) was seen to be significantly higher in the elective group ($P < 0.01$). No significant difference was seen between the emergency and elective groups in terms of total intensive care score and remembering the experience ($P > 0.05$) [Table 5].

Table 3: Distribution of the results of the intensive care scale between the groups

	Environmental awareness during stay in the ICU	Bad experiences encountered	Remembering the intensive care experiences	Care satisfaction in the ICU	Total scores
Age (year)*					
≤50 ^a	17.4±2.01	13.4±2.29	13.3±2.40	14.1±2.05 ^{bc}	58.3±4.89
51-64 ^b	17.6±2.39	13.8±1.93 ^c	12.9±1.79	13.4±1.88 ^{ac}	57.7±4.48
≥65	18.0±1.72	12.6±1.76	12.6±1.73	12.6±1.79 ^{ab}	55.8±4.52
P	0.195	<0.001	0.154	<0.001	0.002
Gender*					
Female	18.1±1.84	13.3±1.67	12.7±2.28	13.3±1.78	57.4±4.49
Male	17.5±2.27	13.3±2.19	12.9±1.67	13.2±2.07	56.9±4.84
P	0.015	0.987	0.239	0.428	0.346
Education*					
Illiterate ^a	17.8±1.26	12.3±1.71	13.3±2.87	13.3±1.89	56.5±6.14
Literate ^b	18.2±1.62	13.6±1.71 ^a	13.0±1.25	12.9±1.85	57.7±3.71
Primary school ^c	17.4±2.27 ^b	13.4±2.18 ^a	12.7±1.77	13.4±1.96	56.9±4.57
Secondary school ^d	18.1±2.51	13.1±2.02	12.7±2.45	13.2±2.27	57.1±5.74
P	0.035	0.011	0.583	0.461	0.688
Marital status*					
Married	17.6±2.16	13.3±2.09	12.9±1.75	13.3±1.96	57.1±4.88
Single	18.3±2.00	13.2±1.69	12.5±2.46	13.1±2.02	57.1±4.01
P	0.021	0.687	0.221	0.593	0.932
Income - expenses*					
Compensate	17.8±2.20	13.1±2.02	12.5±1.68	13.1±1.96	56.4±4.77
Not compensate	17.7±2.05	13.6±1.97	13.4±2.12	13.4±1.97	58.2±4.44
P	0.913	0.029	<0.001	0.258	0.002
Intensive care experience*					
Yes	18.8±2.17	12.8±2.59	12.6±1.52	13.2±2.39	57.4±4.83
No	17.6±2.11	13.3±1.95	12.8±1.94	13.2±1.93	57.0±4.72
P	0.004	0.240	0.384	0.957	0.660
Family type**					
Extended family	16.0±3	13.0±7	13.0±2	14.0±2	56.0±8
Nuclear family	18.0±3	13.0±3	13.0±2	13.0±3	56.0±7
P	<0.001	0.843	0.010	0.047	0.288
Duration of stay in the ICU*					
2 days ^a	18.0±1.96	13.0±1.88 ^{bc}	12.8±1.66	12.8±1.93 ^{bc}	56.6±4.68 ^{bc}
3 days ^b	17.4±2.30	13.9±2.10 ^{bc}	12.9±2.27	13.9±1.81 ^{bc}	58.0±4.82 ^{ac}
4 days ^c	18.0±2.65	11.7±0.58 ^{ab}	12.7±0.58	11.7±2.08 ^{ab}	54.0±1.73 ^{ab}
P	0.071	<0.001	0.844	<0.001	<0.001
State of operation*					
Emergency (n=96)	16.9±2.08	14.1±2.26	13.0±1.67	13.9±1.98	57.9±4.92
Elective (n=204)	18.1±2.07	12.9±1.78	12.7±2.00	12.9±1.87	56.6±4.58
P	0.001	0.001	0.195	0.001	0.320
Type of operation*					
Cardiac valve operation	17.5±1.76	13.0±1.87	12.2±1.68	13.2±1.82	55.8±4.26
Bypass	17.8±2.26	13.4±2.06	13.1±1.93	13.2±2.02	57.5±4.80
P	0.327	0.148	<0.001	0.726	0.004

One-way ANOVA (Brown-Forsythe) - Post-hoc test: LSD=Games-Howell; Independent t-test=Mann-Whitney U-test. *Mean±SD; **Median±IQR. ^aSignificant comparing to its group; ^bSignificant comparing to its group; ^cSignificant comparing to its group; ^dSignificant comparing to its group. IQR=Inter quartile range; ICU=Intensive care unit

When the lengths of ICU stay were considered, the average scores were calculated as 58.0 ± 4.82, 56.6 ± 4.68, and 54.0 ± 1.73 for the patients who stayed in the ICU for 2, 3, and 4 days, respectively and a statistically significant difference was determined

between these average scores (P < 0.001). Those who stayed in the ICU for 2 days were more satisfied (P < 0.001) and their bad experience score was lower than that of patients who stayed for 3 or 4 days (P < 0.001) [Table 3].

Table 4: Evaluation of the emergency and elective ICES results according to operation type

ICES	Type of operation (emergency/elective)	
	Cardiac valve surgery	Bypass
Environmental awareness during the stay in the ICU*	17.2±2.17/17.8±1.58	16.8±2.14/18.2±2.21
P	0.247	<0.001
Bad experiences encountered*	13.4±2.41/12.8±1.58	14.4±2.25/13.0±1.87
P	0.143	<0.001
Remembering intensive care experiences*	13.0±1.87/11.6±1.41	13.0±1.67/13.1±2.06
P	0.001	0.773
Care Satisfaction in the intensive care*	14.2±1.92/12.5±1.51	13.8±2.09/13.0±1.98
P	<0.001	0.003
Total score*	57.8±4.21/54.6±4.07	58.0±5.40/57.3±4.62
P	0.003	0.273

MANOVA=Post-hoc test: Bonferroni. *Mean±SD. MANOVA=Multivariate analysis of variance; SD=Standard deviation; ICES=Intensive care experience scale

Table 5: Evaluation of the ICES results of cardiac valve and bypass operations according to the state of operation

ICES	State of operation (cardiac valve surgery/bypass)	
	Emergency	Elective
Environmental awareness during the stay in the ICU*	17.2±2.17/16.8±2.14	17.8±1.58/18.2±2.2
P	0.395	0.154
Bad experiences encountered*	13.4±2.41/14.4±2.25	12.8±1.58/13.0±1.87
P	0.022	0.501
Remembering intensive care experiences*	13.0±1.87/13.0±1.67	11.6±1.41/13.1±2.06
P	1	<0.001
Care satisfaction in the intensive care*	14.2±1.92/13.8±2.09	12.5±1.51/13.0±1.98
P	0.372	0.106
Total score*	57.8±4.21/58.0±5.40	54.6±4.07/57.3±4.62
P	0.841	<0.001

MANOVA=Post-hoc test: Bonferroni; *Mean±SD. ICES=Intensive care experience scale; SD=Standard deviation; ICU=Intensive care unit

No difference was seen in terms of remembering intensive care experiences, intensive care satisfaction and total intensive care scores between the 30 patients with previous intensive care experience (10%) and the 270 (90%) patients with no previous intensive care experience ($P > 0.05$). The patients with previous intensive care experience had a higher level of environmental awareness ($P < 0.001$) [Table 3].

When the ICES was analyzed according to marital status, no difference was seen between the 240 married (80%) and 80 single (30%) patients in respect of remembering bad experiences encountered and the intensive care experiences, intensive care satisfaction and total intensive care scores ($P > 0.05$). The environmental awareness score

of the married patients (17.6 ± 2.16) was higher than that of the single patients (18.3 ± 2.00) ($P < 0.001$) [Table 3].

No difference was determined between the genders in the comparison of the bad experiences encountered, remembering intensive care experiences, intensive care satisfaction and total intensive care scores ($P > 0.05$). The environmental awareness of the female patients (18.1 ± 1.84) was higher than that of the males (17.5 ± 2.27) ($P = 0.015$) [Table 3].

Discussion

ICUs are known as the places where many life-saving care and treatment methods are implemented. However, during their stay in the ICU, patients may have many negative experiences, which may then have a negative effect on the quality of care and the life of the individual after discharge from the ICU.^[15] Depression is one of these negative effects, and it may be the main predictor of adverse outcomes which can occur after cardiac surgery.^[16] In a study of 109 patients by Beresnevaite *et al.*, a correlation was determined between the patients fell into depression after bypass surgery and postoperative complications.^[17] The low mean scores of the patients who underwent emergency or elective surgery in the current study show that their emotional status was low, which may increase their susceptibility to depression [Table 4]. In particular, it was noticeable that patients who underwent emergency surgery reported more bad experiences, and patients in the elective group had higher environmental awareness. These values show that especially the patients who underwent emergency cardiac surgery may be more prone to depression.^[16,17] Problems may arise in these patients, even leading as far as death, unless measures are taken. There is potential in particular for these patients to have a heart attack within 6 months of being discharged from the hospital.^[18] It has been reported in studies that psychiatric treatment may prevent the negative consequences that may occur before or after the discharge of such patients.^[19-21]

There was no significant difference between the mean scores of the patients who had an emergency or elective bypass surgery. The environmental awareness and the care satisfaction scores of the patients in the elective group were higher than those of the emergency group. This can be attributed to patients being better informed about bypass surgery, which is well-known in the general population.

In the study by Demir *et al.* low mean scores were obtained, which they attributed to the bad experiences of patients.^[5] The low point we determined in our study shows that the intensive care experiences of our patients are negative. In this particular, it is thought that studies are needed on how to resolve the bad experiences of the patients. It is thought that patients to be informed by the healthcare personnel affected the mental health of the patients positively and

reduced anxiety. Therefore, the information given by nurses can be considered to play an important role in the mental health of patients, reducing their anxieties and strengthening their decisions about their healthcare.^[22,23]

There was no significant difference determined according to marital status. Single patients had higher levels of environmental awareness. This could be attributed to the stress felt by married patients at being separated from their spouse or children and unable to fulfill their usual family roles and responsibilities.^[13] In the comparison between the genders, females were determined to have statistically significantly greater environmental awareness than males, which is consistent with the literature.^[13,24]

In the comparison of the duration of stay in the ICU, it was seen that the patients who stayed in the ICU for 2 days were more satisfied more and had fewer bad experiences compared to those who stayed for 3 or 4 days. Therefore, it can be considered that a shorter stay in the ICU is beneficial for mental health, thus preventing mental and physical complications before and after discharge.

Conclusion

It was seen that the patients who underwent cardiac surgery had bad intensive care experiences. In addition, it was determined that the satisfaction levels of the patients who underwent operation electively were higher than the urgent cases, and those who underwent surgery urgently remembered bad experiences more. It was seen that as the time passed in the ICU stringed out, so the bad experiences increased. Besides, the informing performed by medical personnel is all important for increasing the patient satisfaction due to they need to get more information.

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Conflicts of interest

There are no conflicts of interest.

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