# Effect of Patient Education on Patient Anxiety Level Using "Scale of Patient Education Requirements" in Open Heart Surgery

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## ABSTRACT

**Introduction:** The purpose of this study is to research whether education according to individuals' needs has an effect on the anxiety after surgery using a scale of patient education requirements on the patients who will undergo heart surgery.

**Patients and Methods:** The research included voluntary patients who would have an open-heart surgery and are already hospitalized in a heart surgery clinic (n= 114). Data were collected using a demographical data form (state-trait anxiety inventory; STAI) and patient education requirements scale forms, which had been developed by the researchers before surgery and three days later than the surgery by individually meeting the patients. During the hospitalization before surgery, STAI was performed. Further, patient requirements scale was applied. According to patient requirements scale results, the patients were informed at the beginning of hospitalization. On the third day of the surgery, STAI was performed one more time. While evaluating the study data, in addition to descriptive statistical methods, such as frequency, percentage, average, standard deviation, the Kolmogorov–Smirnov distribution test was applied to review normal distribution. Furthermore, paired samples t test was used to compare if parameters had normal distribution for 2 groups, and Wilcoxon sign test was used to compare if parameters had abnormal distribution in the groups. Mann-Whitney U test was used for the comparison of parameters in groups. The results were evaluated at a confidence level of 95%, a significance level of $p < 0.05$, and an advanced significance level of $p < 0.01$.

**Results:** The decrease in the state anxiety level after education according to state anxiety level before education was significant (t= 2.003; p= 0.050). Moreover, the decrease in the trait anxiety level after education was also found to be statistically significant (t= 2.984; p= 0.004).

**Conclusion:** According to the findings obtained in this study, it was revealed that informing the patients using patient education requirements scale according to individuals' needs decreased individuals' anxiety levels.

**Key Words:** Patient's education; patient learning needs scale; cardiovascular surgery; anxiety

## Açık Kalp Cerrahisinde "Hasta Öğrenim Gereksinimleri Ölçeği" Kullanılarak Yapılan Hasta Eğitiminin Hasta Kaygı Düzeyi Üzerine Etkisi

### ÖZET

**Giriş:** Bu çalışmanın amacı kalp cerrahisi geçirecek hastalara ameliyat öncesi "Hasta Öğrenim Gereksinimleri Ölçeği" kullanılarak, bireylerin ihtiyaçlarına göre yapılan bilgilendirmenin ameliyat sonrası anksiyete üzerine herhangi bir etkisinin olup olmadığını araştırmaktır.

**Hastalar ve Yöntem:** Çalışmaya kalp cerrahisi kliniğinde açık kalp ameliyatı planlanan, hastaneye yatışı yapılan ve çalışmaya katılmaya gönüllü olan hastalar (n= 114) dahil edildi. Araştırmacılar tarafından geliştirilen demografik veri formu, State-Trait Anxiety Inventory (STAI) ve Hasta Öğrenim Gereksinimleri Ölçeği formları ameliyat öncesi ve ameliyatın 3. günü hastalar ile yüz yüze görüşme tekniği kullanılarak dolduruldu. Ameliyat öncesi yatışı sırasında öncelikle Durumluluk-Sürekli Anksiyete Envanteri, daha sonra Hasta Öğrenim Gereksinimleri Ölçeği uygulandı. Hasta Öğrenim Gereksinimleri Ölçeği sonuçlarına göre hastalar yatışından itibaren bilgilendirildi. Ameliyatın üçüncü günü hastalara STAI tekrar uygulandı. Çalışma verileri tanımlayıcı istatistiksel metotlar (frekans, yüzde, ortalama, standart sapma) ile özetlendi. Normal dağılımın incelenmesi için Kolmogorov-Smirnov dağılım testi, normal dağılım gösteren parametrelerin iki grup için karşılaştırmalarında eşlenik örnekler (Paired samples) t testi, normal dağılım göstermeyen parametrelerin grup içi karşılaştırmalarında ise Wilcoxon işaret testi kullanıldı. Parametrelerin gruplar arası karşılaştırmalarında Mann-Whitney U test kullanıldı. Sonuçlar %95 güven aralığında, $p < 0.05$ anlamlılık düzeyinde ve $p < 0.01$ ileri anlamlılık düzeyinde değerlendirildi.

**Bulgular:** Hastaların eğitim öncesi durumluluk kaygı (state anxiety) düzeyine göre eğitim sonrası durumluluk kaygı düzeyinde meydana gelen düşüş (t= 2.003; p= 0.050) ile, eğitim öncesi sürekli kaygı (trait anxiety) düzeyine göre eğitim sonrası sürekli kaygı düzeyinde meydana gelen düşüş istatistiksel olarak anlamlı bulundu (t= 2.984; p= 0.004).

**Sonuç:** Bu çalışmada elde edilen bulgular, hastaların ameliyat öncesi Hasta Öğrenim Gereksinimleri Ölçeği kullanılarak bireylerin ihtiyaçlarına göre yapılan bilgilendirmenin bireylerin anksiyetesini azalttığını göstermiştir.

**Anahtar Kelimeler:** Hasta eğitimi; hasta öğrenim gereksinimleri ölçeği; kalp cerrahisi; kaygı düzeyi

## INTRODUCTION

Surgical interventions have the potential of causing serious psychosocial and psychiatric problems, and surgical operation can be an anxiety source and affect postoperative morbidity. It has been stated that medical complications increased after surgery for patients having high anxiety levels before surgery, increased the duration of hospitalization, and delayed the recovery time[1,2]. Education and preparation of patients before surgery had an effect on the patient care after surgery and at the discharge stage. The priority of the information required by surgical patients varies with type of surgery and needs of individual patients. Heart surgery is perceived by most people as a life-threatening event or crisis[3]. The survival rate after open-heart surgery applied by cardiopulmonary bypass definitively increased using innovations of anesthesia management and surgical techniques, advances in cardiopulmonary bypass technology, and development of intensive care treatment principles[4]. Despite these developments, anxiety and fear of death persisted in patients.

Symbolic meaning of "heart operation" increases fear of death and the risk of preoperative anxiety[5]. The most effective approach toward anxious patients has been to reassure and provide psychological support. Patient education had an important role within suggested methods. Education before surgery is an indispensable part of patient care and one of the most important nursing attempts; education provided during this time continues until discharge from the hospital and has an important role for the patient in terms of gaining information regarding surgical intervention and feeling better physically and psychologically[6]. It has been important that patient education requirements are fulfilled before and after surgery. Because fulfilling the education requirements positively affected the quality of patient care results[7,8].

In this study, it was aimed to evaluate the anxiety levels of patients before and after surgery by organizing training and determining patient requirements using the patient education requirement scale.

## PATIENTS and METHODS

After receiving approval from the ethical committee and department of surgery, this comparative and descriptive study was conducted between February 1 and May 31. Before surgery, (in the course of the application to the clinic) state-trait anxiety inventory (STAI), patient education requirements scale, and demographic survey were conducted for patients supposed to undergo an open heart surgery and hospitalized (n= 114) in heart surgery clinics. Patient requirements were defined according to the patient learning requirements scale; education started before surgery and continued until the discharge of patients. On the third day after surgery, STAI was re-applied to the patients.

While evaluating the findings in the study, Statistical Package Program was used for statistical analysis. While evaluating the study data, in addition to descriptive statistical methods, such as frequency, percentage, average, standard deviation, Kolmogorov-Smirnov distribution test was used to review normal distribution. Furthermore, paired samples t test was used to compare if parameters had normal distribution for 2 groups and Wilcoxon sign test was used to compare if parame-ters had an abnormal distribution in the groups. Mann-Whitney U test was used for comparing the parameters between the groups. The results were evaluated at a confidence level of 95%, a significance level of $p< 0.05$, and an advanced significance level of $p< 0.01$.

## RESULTS

In total, 114 patients were involved in the study; 86 (75.4%) patients were male and 68 of them were ≥ 61 years old. Further, 46 (40.5%) patients weighed ≥ 81 kg, 106 (93%) were married, and 110 (96.5%) had at least one child. Eighty patients (70.1%) graduated from primary school. General demographic properties for patients are shown in Table 1.

The decrease in the state anxiety level after education according to the state anxiety level before education was statistically significant (t= 2.003; p= 0.050 < 0.05). The decrease in trait anxiety levels after education was also statistically significant (t= 2.984; p= 0.004 < 0.05) (Table 2). It was determined that the average trait anxiety level of patients was affected by variables, such as gender, smoking, exercising before and after education.

The difference between before and after education trait anxiety levels according to gender was evaluated. The difference between the group average before education (Mann-Whitney U test= 193.50; p= 0.046 < 0.05) and the group average after education (Mann-Whitney U test= 193.00; p= 0.045 < 0.05) was found to be statistically significant (Table 3). The trait anxiety level of females before and after education (n= 49.74, n= 45.23, respectively) was higher than those of males before and after education (n= 43.38, n= 39.95, respectively).

The trait anxiety levels were significantly different with respect to the working status of patients (Mann-Whitney U test= 113.00; p= 0.014 < 0.05). Trait anxiety level of unemployed patients (n= 46.41) was higher than those of employed patients before education (n= 40.02) (Table 4).

**Table 1. Socio-demographic and medical characteristics of patients**

|  | n = 114 | % |
|---|---|---|
| Gender |  |  |
| Male | 86 | 75.4 |
| Female | 28 | 24.6 |
| ≤ 50 | 18 | 15.8 |
| Age (years) |  |  |
| 51-60 | 28 | 24.6 |
| ≥ 61 | 68 | 59.6 |
| ≤ 70 | 36 | 31.5 |
| Weight (kg) |  |  |
| 71-80 | 32 | 28.0 |
| ≥ 81 | 46 | 40.5 |
| Marital status |  |  |
| Married | 106 | 93.0 |
| Single | 8 | 7.0 |
| Children |  |  |
| Yes | 110 | 96.5 |
| No | 4 | 3.5 |
| Education |  |  |
| Primary school | 80 | 70.1 |
| Secondary school | 10 | 8.7 |
| High school | 8 | 7.1 |
| University | 16 | 14.1 |
| Working status |  |  |
| Yes | 34 | 29.8 |
| No | 80 | 70.2 |
| Income (Turkish Lira) |  |  |
| < 1000 | 72 | 63.2 |
| ≥ 1000 | 42 | 26.8 |
| Smoking |  |  |
| Yes | 26 | 22.8 |
| No | 88 | 77.2 |
| Use of alcohol |  |  |
| Yes | 10 | 8.8 |
| No | 104 | 91.2 |
| Exercise |  |  |
| Yes | 28 | 24.6 |
| No | 86 | 75.4 |
| Exercise frequency in one week |  |  |
| 4 | 10 | 35.7 |
| 7 | 18 | 64.3 |
| Diet |  |  |
| Yes | 28 | 24.6 |
| No | 86 | 75.4 |

The difference in anxiety levels respect to exercising was significant before education (Mann-Whitney U test= 135.00; p= 0.004 < 0.05) and after education (Mann-Whitney U test= 167.00; p= 0.026 < 0.05) (Table 3). State anxiety levels of patients who were not exercising before and after education (n= 40.49, n= 37.09, respectively) was higher than the patients who were exercising (n= 31.52, n= 30.48, respectively) (Table 5).

It was observed that 26 (22.8%) patients were regularly smoking and 28 (24.9%) were exercising (Table 6). The difference between trait anxiety levels according to the smoking status was not significant before education (Mann-Whitney U test= 221.500; p= 0.395 > 0.05) was not statistically significant. However, the difference was significant after education (Mann-Whitney U test= 155.50; p= 0.030 < 0.05) (Table 6). State anxiety levels of patients (n= 40.31) who were smoking after education was higher than those of patients (n= 34.06) who quit smoking after education.

## DISCUSSION

It is crucial that nurses determine education requirements considering the education requirements of patients and their families[9,10]. In the present study, we showed that informing the patients using patient education requirements scale according to individuals' needs decreased individuals' anxiety levels of patients undergoing open-heart surgery.

Demographic characteristics of our study population was similar to those of previous studies on patients undergoing an open-heart surgery[11-14].

One of the important targets of the care before surgery is to eliminate the anxiety of patients. The common reasons of anxiety before surgery is pain, fear of disorder, change in body image, being addicted to others, loss of job, and damage of physical integrity. Education before surgery considerably decreases anxiety levels of patient, and the response of patients to treatment become easier[7]. In addition, it has been stated that the most effective method to handle preoperative anxiety was educating patients regarding the disease and surgery[9].

Guo et al[15] have stated that education before coronary artery bypass surgery had a positive effect in decreasing the anxiety and stress of patients; they emphasized that education should be routinely provided to all patients. In the study, it was declared that education had no effect on pain. 'In our study pain was not evaluated but the other findings that Guo and his friends[15] obtained were parallel with our findings. In both studies, it has been concluded that education provided before surgery decreased anxiety levels, and recovery became faster. In another study, the efficiency of preoperative education has been studied and it has been observed that programmed preoperative education decreased anxiety levels[16].

Gallagher and McKidney[17] declared that female and old patients who would have coronary artery bypass surgery had more stress and anxiety in the study conducted in 2007. Furthermore, it was concluded that patients were stressed while they were waiting before surgery, and stressors were the awaiting surgery, thinking of pain, being away from home, thinking of dying from disease or surgery, changing lifestyle, requiring help, and knowing of undergoing surgery. In our study, stressors were not defined. Moreover, it was consistent with the state obtained in the study that trait anxiety levels of female patients before and after education (n= 49.745,

**Table 2. Anxiety level before and after education**

| | Before education (n = 114 ) | | After education (n = 114 ) | | t | p |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | | |
| State anxiety | 37.99 | 9.43 | 35.23 | 9.84 | 2.01 | **0.05** |
| Trait anxiety | 44.94 | 8.04 | 41.24 | 8.32 | 2.98 | **0.004** |

SD: Standard deviation

**Table 3. Anxiety level accordingto gender before and after education**

| | Male (n = 86 ) | | Female (n = 28 ) | | MW | p |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | | |
| State anxiety | | | | | | |
| Before education | 36.91 | 8.51 | 41.31 | 11.55 | 228.5 | 0.178 |
| After education | 33.68 | 9.21 | 39.99 | 10.51 | 200.0 | 0.061 |
| Trait anxiety | | | | | | |
| Before education | 43.38 | 6.22 | 49.74 | 10.98 | 193.5 | **0.046** |
| After education | 39.95 | 8.00 | 45.23 | 8.28 | 193.0 | **0.045** |

MW: Mann whitney, SD: Standard deviation

**Table 4. Anxiety level according to working status before and after education**

| | Working (n = 34) | | Nonworking (n = 80) | | MW | p |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | | |
| State anxiety | | | | | | |
| Before education | 33.98 | 5.46 | 39.42 | 10.57 | 151.0 | 0.114 |
| After education | 32.72 | 7.59 | 35.49 | 10.29 | 193.5 | 0.543 |
| Trait anxiety | | | | | | |
| Before education | 40.02 | 5.67 | 46.41 | 8.41 | 113.0 | **0.014** |
| After education | 39.50 | 6.22 | 41.51 | 9.11 | 179.5 | 0.353 |

MW: Mann whitney, SD: Standard deviation

**Table 5. Anxiety levels according to status of doing exercise before and after education**

| | Exercising (n = 28) | | Not Exercising (n = 86) | | MW | p |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | | |
| State anxiety | | | | | | |
| Before education | 31.52 | 6.34 | 40.49 | 9.34 | 135.0 | 0.004 |
| After education | 30.48 | 7.48 | 37.09 | 10.30 | 167.0 | 0.026 |
| Trait anxiety | | | | | | |
| Before education | 40.84 | 5.47 | 46.65 | 8.41 | 148.0 | 0.009 |
| After education | 37.33 | 7.51 | 43.01 | 8.24 | 170.5 | 0.031 |

MW: Mann whitney, SD: Standard deviation

**Table 6. Anxiety level according to smoking status before and after education**

| | Smoking (n = 26) | | Non-smoking (n = 88) | | MW | p |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | | |
| State anxiety | | | | | | |
| Before education | 40.69 | 10.63 | 37.33 | 9.18 | 221.5 | 0.395 |
| After education | 40.31 | 10.65 | 34.06 | 9.30 | 155.5 | 0.030 |
| Trait anxiety | | | | | | |
| Before education | 48.27 | 11.89 | 44.06 | 6.65 | 215.0 | 0.327 |
| After education | 45.31 | 7.06 | 40.25 | 8.43 | 179.5 | 0.091 |

MW: Mann whitney, SD: Standard deviation

n= 45.233, respectively) were higher than those of male patients before and after education (n= 43.378, n= 39.946, respectively).

In the study by Asilioglu and Celik[16], 100 patients (50 experiment, 50 control) were examined. In the study, postoperative state and trait anxiety points were found slightly higher than patients in the experimental group. It was concluded that there was no statistical difference between the points of state and trait anxiety levels in groups. In studies conducted by Sidar et al[11], statistical significance was not found between total point average gained by state anxiety scale of patients and trait anxiety scale in postoperative period (t= 0.6, p > 0.05; t= −1.0, p > 0.05). Our study results were consistent with those of the study conducted by Asilioğlu and Çelik[16] and supported the hypothesis that education decreased or eliminates anxiety levels.

Deyirmenjian et al. evaluated the effect of preoperative patient education on anxiety level with Beck anxiety scale in 2006[3]. Before surgery, education to the experimental group was provided but the control group had no education. According to the study, significant differences were not found between postoperative anxiety, intubation time, duration of hospitalization, and systolic blood pressure values of two groups. However, statistical difference was found for number of patients who required sedatives in the 2 groups. While in our study, state and trait anxiety points were defined only before and after education; it was inconsistent with the study by Deyirmenjian et al[3], likely because of the different comparison and evaluation criteria.

## CONCLUSION

Therefore, it is believed that the education provided to patients of open-heart surgery considering learning requirements for individuals decreases anxiety levels of patients and improves their quality of life by making them feel safe.

## LIMITATIONS

The results of the study were limited with the university hospital where the study was conducted. It could not be generalized with other patients who had open-heart surgery.

## CONFLICT of INTEREST

The authors declare that there were no conflict of interests in the stage of drafting and publishing this article.

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## AUTORSHIP CONTRIBUTIONS

*Concept/Design:* TY
*Analysis/Interpretation:* SG, AM, YÖ
*Data acquisition:* TY, AM
*Writing:* TY, AM, SG
*Critical revision:* TY, AM, YÖ
*Final approval:* All of authors

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