Original Article / Orijinal Araştırma

Evaluation of the Relationship Between Preoperative Patient Anxiety Level and Health Literacy

Preoperatif Hasta Anksiyete Düzeyleri ile Sağlık Okuryazarlığı Arasındaki İlişkinin Değerlendirilmesi

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Abstract

Aim: Sociodemographic characteristics such as age, gender, and educational status are factors associated with preoperative anxiety. Health literacy may be the influencing factor in different results obtained in various studies regarding the relationship between educational status and preoperative anxiety.

Material and Method: This prospective survey was carried out on 155 patients scheduled for elective surgery at the Department of Otorhinolaryngology between September and November 2019. Sociodemographic and basic health status data were recorded using the State-Trait Anxiety Inventory (STAI-I) and the Health Literacy Index (HLI).

Results: While there was statistically significant difference between average scores of the access, understanding and appraisal of health information subscales according to the HLI (p<0.01), no significant difference was found with average score of the application of health information subscale (p>0.05). A negative medium level relationship was found between average scores of the STAI-I and the HLI (r=-0.424) and application subscale (r=-0.482), and a negative low level relationship was found between the overall STAI-I and the access (r=-0.335), understanding (r=-0.368) and appraisal of health information (r=-0.353) subscales.

Conclusions: It was concluded that the low level of health literacy may be effective in the increased preoperative anxiety levels in patients, and further studies are required to be conducted in this matter.

Keywords: Anxiety, health literacy, educational status

Öz

Amaç: Yaş, cinsiyet, öğrenim düzeyi gibi sosyodemografik özellikler preoperatif anksiyete ile ilişkili faktörlerdir. Öğrenim düzeyi ile preoperatif anksiyete ilişkisinin çalışmalar arasında farklılık göstermesinde sağlık okuryazarlığı etkili olabilir.

Gereç ve Yöntem: Kesitsel türdeki bu anket çalışması, Eylül-Kasım 2019 tarihleri arasında Kulak Burun Boğaz Bölümü'nde elektif operasyon planlanan 155 hasta üzerinde gerçekleştirildi. Hastalara Durumluk Kaygı Ölçeği (STAI-D) ile Sağlık Okuryazarlığı Ölçeği (SOYÖ) uygulanarak, sosyodemografik ve temel sağlık durumu ile ilgili veriler kaydedildi.

Bulgular: Eğitim durumlarına göre SOYÖ ile bilgiye erişim, bilgiyi anlama ve değer biçme alt boyutu puan ortalamalarında istatistiksel açıdan anlamlı bir fark olduğu saptanırken (p<0,01), uygulama alt boyutu puan ortalamasında anlamlı fark tespit edilmedi (p>0,05). STAI-D ile SOYÖ (r=-0,424) ve uygulama alt boyutu (r=-0,482) puan ortalamaları arasında negatif yönde orta düzeyli bir ilişki ve STAI-D ölçeği ile bilgiye erişim (r=-0,335), bilgiyi anlama (r=-0,368) ve değer biçme (r=-0,353) alt boyutları arasında negatif yönde düşük düzeyli bir ilişki olduğu tespit edildi.

Sonuç: Preoperatif anksiyete düzeyindeki artışta düşük sağlık okuryazarlığı seviyesi etkili olabilir. Bu konuda daha ileri çalışmaların yapılması önerilir.

Anahtar Kelimeler: Anksiyete, sağlık okuryazarlığı, öğrenim düzeyi

INTRODUCTION

Anxiety is a natural reaction that an individual develops to circumstances in which they do not feel safe. The level of anxiety during the preoperative period may be affected by various sociodemographic factors such as patients' age, gender, marital status and educational status.[1] There are studies indicating that educational status has positive or negative effects on anxiety, while it was considered ineffective in some studies.[2,3]

Health literacy is defined as the level of ability to obtain, process, and understand basic health information in order to make health decisions.[4] In many studies, it was found that the level of health literacy among university graduates is higher than that of high school and primary school graduates.[5] However, it is a concept influenced by many factors and, contrary to what is expected, those who have high level of education may have low levels of health literacy.[6]

When the literature was reviewed, no studies were found investigating the relationship between preoperative anxiety and health literacy. In this study, it was aimed to evaluate the effect of health literacy on preoperative anxiety, and to reveal the relationship between demographic factors, educational status and basic health status.

MATERIAL AND METHOD

This prospective survey was conducted between September and November 2019 to determine the relationship between the level of health literacy and anxiety and educational status of perioperative patients in accordance with the Declaration of Helsinki. Prior to the study, ethical approval was received from the ethics committee of Necmettin Erbakan University Faculty of Medicine (Date: 13.09.2019, Decision Number: 2019/2041).

The sample of the study consisted of patients aged between 18 and 65, who were to undergo elective surgery at Department of Otorhinolaryngology, and were ASA (American Society of Anesthesiology) I and II. 155 patients who were at least primary school graduates and capable of fully understand the questions were included the study after obtaining written informed consent. Those who were illiterate, non-consenting, pregnant, with mental and/or central nervous system pathology and malignancy, and those in ASA III and IV groups were excluded from the study.

The data were collected through face-to-face interviews and three-parts questionnaire was applied. First part of the form included data on the demographic and basic health status of patients , the second part included the State-Trait Anxiety Inventory (STAI-I) to assess preoperative anxiety levels, and the third part included the Health Literacy Index (HLI) to determine health literacy levels.

State-Trait Anxiety Inventory (STAI) includes state and trait anxiety subscales and developed by Spielberger. The State Anxiety Inventory (STAI-I) is used to evaluate the preoperative anxiety levels of the patients.There are 20 items on both tests, score changes between 20-80.[7]

Health Literacy Scale (HLS); includes 25 items and 4 subscales (access, understand, appraise and apply). Questionnaire type is likert and score changes between 25-125.[8] The higher score means the higher health literacy level.[9]

The sample size of the study was calculated based on the mean STAI-1 score (38.0 ± 9.9) reported in the study by Erkılıç et al., and based on the STAI-1 score (42.72 ± 9.84) reported by Akınsulore et al. The G*Power 3.1 Program was used for the sample size calculation.[10,11] As a result of the analysis carried out at a 90% confidence level with a margin of error equal to 0.05, the effect size 0.48, the sample size was found to be 152. A total of 155 patients were included in the study. While evaluating the findings obtained in the study, SPSS 22.0 Statistical package program was used for statistical analyses. Skewness and Kurtosis values were examined to assess the normal distribution of the data, and the data were found to normally distributed since the values were found to range between +1 and -1. In this context, independent samples t-test, one-way analysis of variance (ANOVA) and linear regression analysis was used for data analysis in addition to descriptive statistics. The research findings were evaluated at a confidence interval of 95% and significance level of $p<0.05$.

RESULTS

The average age of the participants was 36.61±13.94 years, of which 63.2% were male and 67.1% were married. While 33.5% of the participants were primary school graduates, 37.3% held college or university degrees. **Table 1** shows STAI-I Comparison analyzes by demographic data.

Table 2 shows Demographic Data and Main Health Variables with Comparative Analysis of the STAI-I and the HLI. While statistically significant difference was found between average scores of the HLI and access, understanding and appraisal subscales in accordance with educational status ($p<0,01$), no statistically significant difference was found with average score of the application subscale ($p>0,05$). According to the Scheffe Test, one of the post hoc tests applied to determine which groups lead to the significant difference between average scores, the scores of the college-university group were found to be significantly higher.

There was a negative medium level correlation between the average scores of the STAI-I and the HLI (r=-0,424) and application subscale (r=-0,482), while a negative low level correlation was found between the STAI-I and the access (r=-0,335), understanding (r=-0,368) and appraisal of health information (r=-0,353) subscales. It can be concluded that as the average STAI-I score of the participants increases, average scores of the HLI and its subscales decrease.

Table 1: STAI-I Comparison analyzes by demographic data

Variables (n=155)	n	Avg.±Sd.	t / F	p
Gender			-1.944	0.054
Male	98	37.19±8.07		
Female	57	39.75±7.62		
Marital Status			0.188	0.851
Married	104	38.21±8.71		
Single	51	37.98±6.31		
Educational Status			0.224	0.879
Primary School 1	55	38.73±8.95		
Middle School 2	18	37.06±6.03		
High School 3	35	38.11±8.58		
University 4	47	37.87±7.09		
Occupation			2.197	0.091
Government Official 1	32	37.84±8.23		
Self-Employed 2	51	36.57±8.28		
Unemployed 3	39	40.79±7.39		
Other 4	33	37.70±7.48		
Smoking Status			0.430	0.668
Non-smoker	99	38.34±7.30		
Smoker	56	37.77±9.11		
ASA			-0.953	0.342
ASA I	59	37.36±6.92		
ASA II	96	38.61±8.57		
Additional Disease			-2.119	0.036
Yes	112	37.30±7.80		
No	43	40.30±8.13		
Scheduled Operation			0.340	0.796
Cosmetic rhinoplasty1	25	36.96±5.76		
Functional rhinoplasty2	62	38.52±8.66		
Tympanoplasty 3	42	38.67±7.98		
Other 4	26	37.50±8.38		
Previus Surgery			1.037	0.301
Yes	97	38.62±7.33		
No	58	37.28±8.97		

STAI : State- Trait Inventory, ASA: American Society of Anesthesiology, t/F : Independent samples t test/ Analysis of Variance

Table 2. Demographic Data and Main Health Variables with Comparative Analysis of the STAI-I and the HLI

Scales	Avg.±Sd.	Min	Max	Cronbach's Alpha
STAI-I	38.14±7.98	22.00	64.00	0.87
HLI (Overall score)	89.18±19.20	41.00	125.00	0.96
Subscales				
Access	18.53±4.64	7.00	25.00	0.92
Understanding	23.62±6.06	10.00	35.00	0.88
Appraisal	28.32±6.79	11.00	40.00	0.90
Application	18.72±4.07	9.00	25.00	0.83

* STAI : State- Trait Inventory, HLI : Health Literacy Index

The regression analysis conducted between the average HLI scores and its subscales and the STAI-I was given in the **Table 3**. The analysis performed between the HLI and the STAI-I was found to be statistically significant (p<0.001). 18% of the variance in the STAI-I is explained by the HLI (R^2=0,18). The variance in the HLI is negatively reflected in average score of the STAI-I. The analysis conducted between the access, understanding, appraisal, and application of health information subscales of the HLI and the STAI-I was found to be statistically significant (p<0.001). 23% of the variance in the STAI-I is explained by the application of health information subscale (R^2=0,23). The variance in the application of health information subscale is negatively reflected in the average score of the STAI-I.

Table 3: Regression Analysis between STAI-I and HLI

Dependent variable	Independent variable	B	sh	T	F	p	R2
STAI-I	State	53.84	2.77	19.41	33.54	<0.001	0.18
	HLI (overall score)	-0.18	0.04	-5.79			
STAI-I	State	48.81	2.50	19.51	19.35	<0.001	0.12
	Access	-0.58	0.13	-4.40			
STAI-I	State	49.58	2.41	20.55	23.99	<0.001	0.13
	Understanding	-0.48	0.09	-4.89			
STAI-I	State	49.88	2.59	19.27	21.78	<0.001	0.12
	Appraisal	-0.41	0.09	-4.67			
STAI-I	State	55.83	2.66	20.99	46.36	<0.001	0.23
	Application	-0.94	0.14	-6.81			

*B: Beta, se: Standard error, T: Independent samples t test, F: Analysis of Variance

DISCUSSION

Although the STAI-I threshold used in case of clinically significant anxiety ranges between 39 and 40, while it varies between 36 and 45 in different studies conducted in preoperative patients.[12-14] In the current study, the mean±SD STAI-I scores of preoperative patients was found 38.14±7.98. The participants obtained an average score of 89.18±19.20 from the HLI, while it was 18.53±4.64 for access of health information, 23.62±6.06 for understanding of health information, 28.32±6.79 for appraisal of health information, and 18.72±4.07 for application of health information, which are consistent with the literature.[8]

While most studies have shown that preoperative anxiety levels are higher in women, there are also studies that report no relationship according to gender.[15-17] In these studies, it has been stated that this difference between women and men may be related to the fact that women are more comfortable expressing their concerns, and are more anxious due to separation from family members.

Although the majority of studies indicate that there is no relationship between age and preoperative anxiety level, it has been found that the level of health literacy decreases as age increases.[15,16,18] Decreased level of health literacy with increased age may be associated with conditions such as low educational level of older people, decline in cognitive abilities, and the inability to closely follow developments.

Regarding the relationship between preoperative anxiety and additional diseases, studies found that patients with chronic diseases had higher levels of anxiety or there was no relationship; however, contrary to the literature, the current study determined that those without additional diseases obtained significantly higher average scores from the STAI-I compared to others.[3,6] This may be explained by the fact that

patients with chronic diseases develop the ability to accept their illness and cope with it, which leads to a positive perception on anxiety. When the relationship between health literacy and additional diseases was examined, numerous studies found that those with additional diseases had lower levels of health literacy.[18,19] In this study, no significant difference was found between average scores of the HLI and its subscales according to the status of having additional diseases (p>0.05). While most studies associated lower level of health literacy of people with additional diseases with their old age and low educational level, no significant difference was found in this study; which can be associated with the fact that our study population has a lower average age and no additional diseases.

There are studies indicate that anxiety scores of the group without previous anesthesia experience are higher than those experienced it, or there is no relationship.[12,17,21] In this study, it was found that there was no statistically significant difference between the average preoperative anxiety scores and previous surgery. While there was no significant difference between the HLI and access, understanding and appraisal of health information subscales according to previous surgery, a statistically significant difference was found in the average score of application of health information subscale, and those who previously underwent surgery were found to obtain higher average scores. Consistent with other statistical data in our study, this may be associated with the fact that the application of health information subscale may be related to individuals' experiences rather than their level of education.

In some studies, it was found that people with higher level of education had higher levels of preoperative anxiety.[2,12,14,15,21,22] This result was explained by the fact that as the level of education of patients increased, their awareness of the risks of anesthesia and surgery increased, and that these individuals were more capable of expressing their anxiety.[21] However, individuals with a high level of education are expected to research more and be able to cope with stress more comfortably since they have higher knowledge. On the contrary, there are also studies indicating that there is no relationship between educational status and preoperative anxiety.[22,23] In the current study, there was no statistically significant difference between educational status and anxiety. In most of the studies evaluating the relationship between health literacy and educational status, it is stated that as the level of education of individuals increases, the level of health literacy also increases.[4,24-29] However, health literacy is a concept influenced by many factors and, contrary to what is expected, people with higher level of education may have low level of health literacy.[6] Although there are more studies indicating a positive correlation between educational status and health literacy, it is not an absolute requirement that higher educated individuals would have higher levels of health literacy.[30] This is associated with the fact that educational status is not the only determinant of the health literacy level. In the study, it was concluded that there was a statistically significant difference in average scores of the participants obtained from the HLI and accessing, understanding and appraisal of health information

subscales according to their educational status, while there was no significant difference in average score of the application of health information subscale. Therefore, the ability of patients to make informed decisions about medical issues and to reflect opinions on health-related issues are not directly related to their educational background. As well as experiences, interests, interest in general cultural activities such as reading books or going to the movies; the strength of one's will may also be related to their ability to do what is needed for their own health.

The variance in the HLI and all subscales is negatively reflected in the average STAI-I scores. In the study, the most effective HLI subscale on the average score of STAI-I was application of health information subscale, and no statistical difference was found with the educational status of the patients. This finding may also be explained by the fact that there is no direct relationship between educational status and preoperative anxiety, or that there are different findings in the literature.

In the study, the relationship between health literacy and preoperative anxiety is revealed more decisively than the educational status. This result can also be considered as the effect of decreased level of preoperative anxiety related to educational status as well as its effect on health literacy; since people with high educational level obtained higher scores in other subscales except for application of health information in this study. However, the fact that the application subscale was the most effective subscale on preoperative anxiety, and that it was not found to be related to educational status may be interpreted that the level of education does not always lead to a positive effect on preoperative anxiety.

We consider that the effect of educational status on preoperative anxiety is due to the positive effect it has on health literacy. That is because, although three of four subscales of the HLI were related to education, the application of health information subscale was the most effective subscale on preoperative anxiety despite the fact that it was independent of the educational status.

High level of preoperative anxiety in individuals with low level of health literacy may be associated with the fact that since patients are more capable of accessing and understanding health information as well as interpreting and evaluating it during the preoperative period, they manage the situation more comprehensively and be actively involved throughout the process.

CONCLUSIONS

There are different results in the literature regarding the relationship between preoperative anxiety levels and educational status, and a consensus on the issue has not been reached. There is also no decisive agreement on the relationship between health literacy and educational status. In addition, although people have a similar level of education, their reading, writing, comprehension and calculation skills may vary. Therefore, it is stated that the level of health literacy should be taken into consideration when evaluating an individual about health-related issues, rather than solely focusing on their educational status (31). The effect of educational status on preoperative anxiety may actually be due

to its effect on the level of health literacy. The most important reason for this conclusion is that the relationship between educational status and preoperative anxiety was found to vary in different ranges in the literature. In the light of the above information, it has been considered that it is appropriate to evaluate health literacy rather than the educational status when examining preoperative anxiety levels; however, more studies are needed to examine the relationship between health literacy and educational status and preoperative anxiety.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Ethics Committee of Necmettin Erbakan University Faculty of Medicine (Date: 13.09.2019, Decision Number: 2019/2041).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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