

RESEARCH ARTICLE

The Effect Of Patients' E-Health Literacy On Their Preoperative Anxiety Levels And Fears About Anesthesia

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September 2023

Volume:20

Issue:55

DOI: 10.26466//opusjsr.1343782

Abstract

The aim of this study is to examine the effect of e-health literacy on preoperative anxiety levels and fears about anesthesia of individuals who will undergo surgery. The research was carried out with 219 patients waiting in the preoperative waiting unit. The Amsterdam Preoperative Anxiety Scale (APAIS) was used to evaluate the preoperative anesthesia anxiety, the E-Health Literacy Scale was used to determine the e-health literacy, and the questionnaire form was used to determine the fear of anesthesia, which was created by using the items in the literature in previous studies on anesthesia fear. According to the results of the research, the three items that patients fear the most about anesthesia are; "feeling pain during surgery", "feeling pain after the effect of post-operative anesthesia" and "waking up in the middle of surgery". There is no significant difference in anesthesia-related fears of patients with low, medium and high e-health literacy, only a significant difference in preoperative anxiety scores between patients with low and high e-health literacy. Study results were interpreted as the ability of individuals with high e-health literacy to evaluate the data obtained through digital channels in terms of reliability prevents them from experiencing unnecessary anxiety based on erroneous information.

Keywords: Preoperative Anxiety, Fear of Anesthesia, E-Health Literacy

Citation:

Saltalı, Ö, A. (2023). The Effect Of Patients' E-Health Literacy On Their Preoperative Anxiety Levels And Fears About Anesthesia. *OPUS- Journal of Society Research*, 20(55), 704-712.

Öz

Bireylerin tedavi sürecinde ameliyat kararının alınması çoğu hasta için gerek ameliyatın nasıl geçeceği gerekse ameliyat sürecindeki anestezi uygulamalarıyla ilgili olarak kaygı yaratan bir durumdur. Bu çalışmanın amacı cerrahi operasyon geçirecek bireylerin e-sağlık okuryazarlıklarının preoperatif kaygı düzeylerine ve anesteziye ilişkin korkularına etkisinin incelenmesidir. Araştırma ameliyat öncesi bekleme ünitesinde bekleyen 219 hasta ile gerçekleştirilmiştir. Hastaların preoperatif anestezi kaygılarının değerlendirilmesinde Amsterdam Preoperatif Kaygı Ölçeği (APAIS), e-sağlık okuryazarlıklarının belirlenmesinde E-Sağlık Okuryazarlığı Ölçeği, anesteziye ilişkin korkularının belirlenmesinde ise literatürde daha önce anestezi korkusu ile ilgili çalışmalarda yer alan korku maddelerinden faydalanılarak oluşturulan anket formu kullanılmıştır. Ayrıca demografik verilerin belirlenmesinde kişisel bilgi formu kullanılmıştır. Araştırma sonuçlarına göre hastaların anestezi ile ilgili en çok korktukları üç madde; "ameliyat sırasında ağrıyı hissetmek", "ameliyat sonrası anestezinin etkisi geçince ağrı hissetmek" ve "ameliyatın ortasında uyanmak" şeklinde belirlenmiştir. Ayrıca e-sağlık okuryazarlığı düşük hastaların preoperatif kaygılarının e-sağlık okuryazarlığı yüksek olan hastalardan anlamlı düzeyde yüksek olduğunu göstermiştir.

Anahtar Kelimeler: Preoperatif Kaygı, Anestezi Korkusu, E-Sağlık Okuryazarlığı

Introduction

More than 300 million surgical operations are performed worldwide each year (Gillespie et al., 2021). The decision taken from the moment the decision to make a surgical operation is announced to the patient has some effects on the patient. One of these effects is the preoperative anxiety experienced by the patients. According to studies, hospital-related anxiety is observed in approximately 60-80% of patients who will undergo surgery (Julian, 2011). Since preoperative concerns negatively affect many health parameters of the patients both during and after the operation, it is important to understand well and to take steps to eliminate them (Tanik Türkan, 2021; Jjala et al., 2010). Lack of knowledge and uncertainties about the surgical process and anesthesia play a role in the formation of these anxieties in most of the patients who have preoperative anxiety, especially in patients who do not have previous surgical experience. Many patients refer to different sources of information in order to eliminate the uncertainty about each stage of the surgical process (Tulgar et al., 2017). Rapid advances in digital technologies have made digital technologies with internet access an important data source for patients. There are conflicting results in the literature, stating that obtaining information in the preoperative period reduces anxiety (Chan & Molassiotis, 2002), increases (Moore & Pace, 2003) or does not affect (de Oliveira Cuman et al., 2013). At this point, it is thought that the e-health literacy of individuals who use e-resources as a source of information may affect their levels of preoperative anxiety and fear about anesthesia. The aim of this study is to examine the effects of e-health literacy on individuals' preoperative anxiety levels and their fears about anesthesia.

Method

Study type

This cross-sectional study was conducted with patients who had undergone surgical operation between January 2023 and June 2023, met the

inclusion criteria and volunteered to participate in the study.

Study group

The study group of this research consisted of 219 patients who voluntarily accepted to participate in the study among the patients who would undergo elective surgery. Some selection criteria were taken into account in the selection of patients. Between the ages of 18-65, non-health worker, American Society of Anesthesiologists (ASA) classification I and II, native Turkish speaker, no previous surgical operation, literate and reading comprehension, no history of psychological disorders and drug use, vision, hearing or language problems Patients who do not have a problem that prevents communication, use digital technologies, have access to a smart device, and use e-resources on health-related issues as information sources were invited to participate in the study. The distribution of patients according to demographic information is as follows. The arithmetic mean of the ages of the patients aged between 18-64 was 35.11 (sd=12.67) 72 women and 147 men. 116 of them work in a regular job, 103 of them do not work. 88 of them have primary education, 80 have high school, 51 have university or higher education level. 128 of them live in the city center, 26 in the district and 65 in the village. 184 patient have no additional disease, 35 patient have got. 178 of them live in nuclear families and 41 of them live in extended families. 125 of them are married, 88 of them are single, 6 of them are separated from their spouses. 117 have children, 102 have no children. 116 of them smoke and 103 of them do not. 42 of them are ASA I and 177 are ASA II patients. 114 of them were operated under general anesthesia and 105 of them were operated under spinal anesthesia.

Data Collection Tools

Personal information form: The personal information form consists of questions containing demographic information about the patient (age, gender, marital status, education level, living place, employment status). In addition, the personal information form includes a section of

three questions to be filled by the anesthesiologist, which includes information about the surgical operation the patient will undergo, the ASA score, and the type of anesthesia to be administered.

E-Health Literacy Scale: The E-Health Literacy Scale, which was developed by Cameron D. Norman and Harvey A. Skinner. Turkish validity and reliability studies were conducted by Gencer (2017), was used to determine the e-health literacy levels of patients who will undergo surgical operation in the study. The scale consists of eight items in total. It includes a five-point Likert type evaluation as (1) Strongly Disagree, (2) Disagree, (3) Undecided (4) Agree, (5) Strongly Agree. High scores obtained from the scale indicate the high level of e-health literacy. The Cronbach alpha internal consistency coefficient of the scale calculated in this study was .95.

Preoperative Anxiety Scale (APAIS): The Amsterdam Preoperative Anxiety and Knowledge Scale (APAIS) was used to assess preoperative anxiety. APAIS is a 6-item measurement tool that includes three sub-dimensions and a five-point Likert-type assessment. Sub-dimensions of APAIS; anesthesia-related anxiety, surgery-related anxiety, and the desire to obtain information. It was translated into Turkish and used for the first time in our country by Aykent et al. (2007). Within the scope of this study, the sub-dimension of the scale measuring anxiety related to anesthesia was used. The scores that can be obtained from this sub-dimension vary between 2 and 10, and an increase in the score indicates the high level of anesthesia anxiety. In our study, the Cronbach alpha internal consistency coefficient of this sub-dimension was calculated as .88.

Anesthesia Fears Questionnaire: "Anesthesia Fears Questionnaire Form" was used to determine the fears of the patients about anesthesia. Türkyılmaz et al. (2018) and the items used in the study of Çelik and Edipoğlu (2018) regarding the fears that patients who will undergo surgical procedures may experience due to anesthesia were used. Participants answered each question in the questionnaire by choosing one of the options: no, I have never experienced (0 points) and yes, I have experienced (1 point). The fact that the arithmetic mean value of each question approaches one

indicates that the patient's fear of anesthesia is experienced by the patients at a high rate, while the approach to zero indicates that the patient's fear of anesthesia is experienced at a lower rate.

Data Collection

Data were collected from patients who met the inclusion criteria and volunteered to participate in the study by filling out the measurement tools on paper while they were in the preoperative waiting unit before undergoing surgery.

Analysis of Data

IBM Statistical SPSS 23.0 statistical package program was used in the analysis of the data. The suitability of the data to the normal distribution was examined with skewness and kurtosis values. Then, analyzes were carried out in line with research purposes. Arithmetic mean and standard deviation values were used in comparisons, t-test was used for independent groups in cases where there were two groups, and one-way analysis of variance was used in cases where there were three groups. Tukey's test was used to determine which groups were significantly different when there was variation between groups in the analysis of variance.

Ethical Dimension of Research

Ethics committee approval of the study was obtained from the Ethics Committee of KTO Karatay University Faculty of Medicine, Non-Pharmaceutical and Medical Device Researches, with the decision number 2023/023, dated 2023. All of the patients included in the study participated voluntarily and written informed consent was obtained from all of them.

Results

According to the results obtained from the study, the statistical analysis results regarding the e-health literacy, preoperative anxiety levels and the differentiation status of anesthesia fears of the patients who will undergo the operation according

to the gender, marital status, employment status, education level, and living place of the patients are presented in Table 1.

Table 1. Comparisons of patients' e-health literacy, preoperative anxiety levels and anesthesia fears according to some variables

Dependent Variables	Gender	Independent Variables			
		Marital status	Employment status	Education level	Living place
E-health literacy	F= 29.33 M= 28.28 t=0.880 p=0.380	Ma= 27.48 S=29.85 t=-.667 p=.499	E= 28.89 UE=28.32 t=-0.468 p=.640	PS= 26.23 SS= 29.93 HE= 30.74 F=5.593 p=0.004***	V=27.76 D=28.84 T=30.26 F=1.685 p=.188 (PS-SS, PS-HS)
Preoperative Anxiety Level	F= 4.35 M= 3.37 t=3.916 p=0.000***	Ma= 3.58 S= 3.75 t=-1.894 p=.060	E=3.56 UE=3.81 t=-1.125 p=.262	PS= 3.78 SS= 3.68 HE= 3.63 F=.065 p=.937	V=3.55 D=4.08 T=3.81 F=1.171 p=.312
Anesthesia fear item 1	F= .50 M= .47 t=2.536 p=0.012**	Ma=.50 S=.47 t=0.397 p=.692	E=.30 UE=.41 t=-1.666 p=.097	PS=.35 SS=.35 HE=.35 F=.001 p=.999	V=.38 D=.27 T=.34 F=.539 p=.584
Anesthesia fear item 2	F=.50 M=.44 t=3.168 p=0.002**	Ma=.48 S=.47 t=-.385 p=.700	E=.25 UE=.37 t=-1.923 p=.058	PS=.32 SS=.29 HE=.33 F=.164 p=.849	V=.31 D=.16 T=.27 F=1.940 p=.146
Anesthesia fear item 3	F=.50 M=.43 t=4.510 p=0.000***	Ma=.49 S=.46 t=1.230 p=.220	E=.32 UE=.38 t=-0.978 p=.329	PS=.42 SS=.30 HE=.29 F=1.756 p=.175	V=.34 D=.35 T=.37 F=.104 p=.901
Anesthesia fear item 4	F=.48 M=.37 t=3.058 p=0.000***	Ma=.44 S=.38 t=1.520 p=.130	E=.16 UE=.24 t=-1.340 p=.182	PS=.26 SS=.19 HE=.24 F=.653 p=.522	V=.24 D=.19 T=.23 F=.109 p=.897
Anesthesia fear item 5	F=.49 M=.41 t=2.440 p=0.016*	Ma=.47 S=.42 t=1.384 p=.168	E=.24 UE=.32 t=-1.348 p=.179	PS=.30 SS=.24 HE=.29 F=.536 p=.586	V=.27 D=.23 T=.32 F=.517 p=.597
Anesthesia fear item 6	F=.45 M=.39 t=1.401 p=0.164	Ma=.42 S=.41 t=.140 p=.889	E=.19 UE=.25 t=-1.150 p=.251	PS=.25 SS=.24 HE=.14 F=1.321 p=.269	V=.21 D=.27 T=.22 F=.216 p=.806
Anesthesia fear item 7	F=.39 M=.18 t=3.217 p=0.002**	Ma=.45 S=.41 t=.930 p=.354	E=.19 UE=.30 t=-1.792 p=.075	PS=.25 SS=.28 HE=.22 F=.316 p=.729	V=.21 D=.32 T=.25 F=2.645 p=.073
Anesthesia fear item 8	F=.49 M=.43 t=2.226 p=0.028*	Ma=.46 S=.44 t=.675 p=.500	E=.26 UE=.33 t=-1.048 p=.296	PS=.28 SS=.29 HE=.29 F=.008 p=.992	V=.30 D=.27 T=.29 F=.065 p=.937
Anesthesia fear item 9	F=.49 M=.43	Evli=.47	E=.26 UE=.33	PS=.26 SS=.31	V=.28 D=.35

	t=2.420 p=0.017*	Bekar=.45 t=-1.201 p=.231	HE=.31 F=.335 p=.715	T=.29 F=.217 p=.805	
Anesthesia fear item 10	F=.42 M=.37 t=1.867 p=0.064	Ma=.38 S=.42 t=-.954 p=.357	E=.16 UE=.24 t=-1.311 p=.191	PS=.16 SS=.22 HE=.23 F=.807 p=.448	V=.27 D=.22 T=.21 F=1.413 p=.246
Anesthesia fear item 11	F=.46 M=.31 t=3.058 p=0.003**	Ma=.41 S=.33 t=1.486 p=.139	E=.17 UE=.24 t=-1.323 p=.187	PS=.18 SS=.13 HE=.22 F=.994 p=.372	V=.18 D=.12 T=.18 F=.888 p=.413

Note: The abbreviations in the table are as follows. Gender: F= Female, M=Male; Marital status: Ma=Marriage; S=Single; Employment Status; E=Employee, UE=Unemployee; Education level: PS= Primary school, SC= Secondary school, HE= Higher education, Living place; V=Village, D=District, T=Town

According to the results obtained from the study, it was determined that the e-health literacy, preoperative anxiety levels and anesthesia fears of the patients who will undergo the operation did not differ according to the variables of marital status, employment status, and place of residence ($p>0.05$ for all comparisons). For the education level variable, e-health literacy of only primary school graduates was found to be statistically significantly lower than high school and university graduates ($p=0.004$). The education level variable did not create a significant difference in anesthesia fears and preoperative anxiety levels ($p>0.05$). However, according to the gender variable, the preoperative anxiety levels ($t=4.089$ and $p<0.001$) and anesthesia fear levels (except for item 6 and item 10) of female patients were significantly higher than male patients, statistically (Table 1). The results of the analysis regarding the average of the anesthesia-related fear scores of the patients are presented in Table 2.

Table 2. Arithmetic mean and standard deviation values of patients' fear of anesthesia

Anesthesia Fears Questionnaire Questions	Mean	Sd
1. Feeling the pain during the surgery	.49	.35
2. Waking up in the middle of surgery	.47	.31
3. Feeling pain after the effect of post-operative anesthesia wears off	.48	.35
4. Having nausea and vomiting problems after surgery	.45	.23
5. Being permanently disabled	.42	.28
6. Inexperience of the anesthesiologist	.41	.22
7. Needling and other procedures to be done	.43	.25
8. Not being able to wake up from anesthesia	.45	.29

9. Paralysis due to anesthesia	.45	.29
10. Do not engage in undesirable behaviors due to anesthesia	.40	.20
11. Having problems with remembering in the postoperative period	.38	.17

When Table 2 is examined, according to the results of the analysis of the patients' fears about anesthesia, the three items they fear the most are; "feeling pain during the surgery", "feeling pain after the effect of the anesthesia after the surgery" and "waking up in the middle of the surgery". The three items that they fear the least are "having remembering problems in the post-operative period", "behaving undesirable due to anesthesia" and "inexperience of the anesthesiologist".

Some values were calculated before the analyzes to determine the effect of patients' e-health literacy on their preoperative anxiety levels and anesthesia fears. First of all, patients' e-health literacy was categorized as low, medium and high. In determining these levels, arithmetic mean (Mean=28.63) and standard deviation values (Sd=9.00) of patients' e-health literacy were used. One standard deviation below (19.63) and one standard deviation above (37.63) of the arithmetic mean was determined, and patients with a score in this range were considered to be at intermediate level of e-health literacy. Those with a score less than one standard deviation below the arithmetic mean were considered low e-health literate, and patients with a high score above one standard deviation were considered high e-health literate. Then, preoperative anxiety levels and fears about anesthesia of patients with low, medium and high e-health literacy were compared. The results of the arithmetic mean, standard deviation and comparisons between the groups of the groups are presented in Table 3.

Table 3. Comparisons of Anesthesia Fears and Perioperative Anxiety Levels of Patients with Low-Medium-High E-Health Literacy

	Arithmetic Means and Standard Deviation by E-Health Literacy			F	p (Significance)
	Low	Medium	High		
Preoperative Anxiety Level	3.91 ±1.89	3.50 ± 1.61	3.03 ± 1.45	3.511	.032 (Low-High)
Anesthesia fear item 1	.48 ± .34	.48 ± .36	.52 ± .33	.056	.945
Anesthesia fear item 2	.40 ± .19	.46 ± .29	.54 ± .43	2.932	.055
Anesthesia fear item 3	.49 ± .38	.47 ± .34	.48 ± .35	.084	.920
Anesthesia fear item 4	.42 ± .22	.43 ± .24	.42 ± .22	.336	.715
Anesthesia fear item 5	.40 ± .19	.46 ± .30	.45 ± .28	.855	.427
Anesthesia fear item 6	.37 ± .16	.42 ± .22	.44 ± .25	.505	.604
Anesthesia fear item 7	.47 ± .25	.42 ± .23	.45 ± .29	.360	.698
Anesthesia fear item 8	.33 ± .12	.46 ± .31	.48 ± .33	2.492	.085
Anesthesia fear item 9	.37 ± .16	.48 ± .34	.42 ± .23	2.875	.059
Anesthesia fear item 10	.33 ± .13	.43 ± .24	.33 ± .12	2.278	.105
Anesthesia fear item 11	.34 ± .13	.39 ± .18	.38 ± .17	.277	.759

When table 3 is examined, it is seen that there is no significant difference in anesthesia-related fears of patients with low, medium and high e-health literacy (p>0.05), only a significant difference in preoperative anxiety scores between patients with low and high e-health literacy (p=.032). It was determined that the preoperative anxiety of the patients in the low e-Health literacy group was significantly higher than the patients in the high e-Health literacy group.

Discussion and Conclusion

Surgical interventions are one of the important situations that cause patients to experience anxiety. Almost half of patients undergoing surgery experience preoperative anxiety (Abate et al., 2020; Friedrich et al., 2022). In particular, preoperative anxiety appears as a feeling of uneasiness that affects the sympathetic and parasympathetic nervous system and manifests itself with the deterioration of hemodynamics, resulting from not

knowing the situations that the patient will encounter. The surgical procedure applied to the patient, the risks involved in the procedures, the problems that may be experienced during and after the procedure, the anesthesia applied during the surgical procedure, the fears of the individual regarding anesthesia and many demographic factors play a decisive role on the anxiety levels experienced by the patients (Abate et al., 2020; Çevik Acar & Yıldız Hazelnut. 2015). In this study, preoperative anxiety levels and anesthesia fear levels of female patients were found to be statistically significantly higher than male patients according to the gender variable. Many studies have reported that female patients have higher preoperative anxiety levels than males (Abate et al., 2020; Friedrich et al., 2022; Khalili et al., 2020; Kumar et al., 2019; Maiye & Dal Yılmaz, 2022). It is seen that the result of the study is compatible with the literature. In the literature, it is argued that the expression of emotions by men is perceived as weakness by some societies and therefore men do not explain emotions such as anxiety and fear. It is also known that hormonal fluctuations in women are also effective on anxiety levels (Mavridou et al., 2013; Matthias & Samarasekera, 2012). For these reasons, it was thought that the anxiety levels of the women might have been high.

Preoperative anxiety is higher in patients with a high need for information. It is reported that patients try to access health-related information in order to eliminate ambiguities, and e-health literacy levels are examined in parallel with the increase in the use of digital resources (Chang et al., 2020; Friedrich et al., 2022). Health literacy, defined by the World Health Organization (WHO) in 1998, is defined as cognitive and social skills that determine the ability of individuals to access, understand and use information (Nutbeam, 1998). In this study, the e-health literacy levels of the patients were evaluated and it was determined that the education level variable was effective. It was determined that the e-health literacy of primary school graduates was statistically significantly lower than those of high school and university graduates. It is reported in the literature that there is a positive correlation between education level and health literacy levels (Chang et al., 2020; Rosenbaum et al., 2015; Scarpato et al.,

2016). It is known that health literacy is affected by many factors. Therefore, it is possible to have low levels at higher education levels (Cho et al., 2007). The research results showed that there was no significant difference in the anesthesia fears of patients with low, medium and high health literacy. However, the three items that patients fear and fear most about anesthesia are; It was determined that "feeling pain during the operation", "feeling pain after the effect of anesthesia after the operation" and "waking up in the middle of the operation". In the study conducted by Demir et al. (2009), it was determined that 39.1% of the patients experienced fear of anesthesia, and it was reported that the subjects they feared the most were "not being able to wake up after the surgery (68.7%), not being able to sleep fully during the surgery (18.3%) and feeling pain (17.2%)". In addition, in the same study, it was determined that 41.2% of the patients did not have a specific reason for these fears. In a study of 200 people by Zvara et al. (1997), the main concerns of patients about anesthesia are listed as the anesthetic drug to be used, the induction method and the side effects of these procedures after surgery. The findings of the study are similar to the literature. Knowing the subject that patients are most afraid of will be important for enlightening the patient. In addition, it is thought that it is important to make patient-specific evaluations and to organize special trainings for the evaluation results.

In addition to informing healthcare professionals as a source of information, patients also use digital platforms widely with the developing technology. This situation has revealed e-health literacy, which is a version of health literacy. However, the lack of awareness of the use of digital resources may cause patients' anxiety to increase, the inability to distinguish between true and false information when appropriate data sources are not used, and the increased sense of anxiety may lead to more health screenings. This situation can be explained by the new concept of cyberchondria. Cyberchondria, which is made for the research of health information due to the concerns that develop in the individual about health; however, it is defined as long-term and repeated searches on the Internet, which increases the anxiety

experienced more. At this point, it is important for patients to obtain information from the right sources (McMullan et al., 2019). Demir et al. (2009) reported that 90% of the patients wanted to get information about anesthesia from the anesthesiologist in their study on anesthesia applications. Egbert et al. (1963) showed in their study that the anesthetist preoperative visit was more effective than barbiturate in reducing anxiety. Jlala et al. (2010), in a study they conducted, the satisfaction rates of patients who were informed via multimedia before the surgery were found to be high. Lozada et al. (2016) reported that 97% of the patients who were evaluated for preanesthetics by telephone were satisfied with receiving information by telephone. Anesthesiologists have a great responsibility in this matter.

Finally, in the study, it was determined that there was no significant difference in the fear of anesthesia ($p>0.05$) in patients with low, medium and high health literacy ($p>0.05$), but there was a significant difference in preoperative anxiety scores between patients with low and high e-health literacy ($p=.032$). It was found that the preoperative anxiety of the patients in the low e-Health literacy group was significantly higher than the patients in the high e-Health literacy group. This result was interpreted as the ability of individuals with high e-health literacy to evaluate the data obtained through digital channels in terms of reliability prevents them from experiencing unnecessary anxiety based on erroneous information.

In conclusion;

Preoperative anxiety is a critical problem for patients undergoing surgery. It is seen that the gender variable is important on the anxiety experienced by the patients in the preoperative period, and the educational status is important on the e-health literacy levels. It will be important that patients' fears of anesthesia are reduced by anesthesiologists, who are appropriate sources of information, and that they are tailored to the individual needs of the patient in order to develop effective management strategies. In addition, patients with low e-health literacy have high preoperative anxiety levels. Therefore, in today's

conditions where digital resources are used so widely, developing policies to increase patients' e-health literacy may contribute to reducing the anxiety level of patients before surgery.

Disclosure Statement

The author reports no conflicts of interest in this work.

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