



## Using the APAIS Score for Preoperative Anxiety of Anesthesia Evaluation Among Adult Patients at Hillah Teaching Hospitals

Moustafa A. Al-Shammari

Applied Biotechnology Department, College of Biotechnology, Al-Qasim Green University, Babylon, Iraq

### ARTICLE INFORMATION

#### Article history:

Received: 02 April 2024

Revised: 09 May 2024

Accepted: 20 May 2024

Published: 28 June 2024

#### Keywords:

Adults, Anxiety, Anesthesia, Operation.

#### Corresponding author:

Moustafa A. Al-Shammari

Email: [moustafa.ali@biotech.uoqasim.edu.iq](mailto:moustafa.ali@biotech.uoqasim.edu.iq)

Applied Biotechnology  
Department, College of  
Biotechnology, Al-Qasim Green  
University, Babylon, Iraq

### ABSTRACT

**Background:** Patients' preoperative anxiety is a considerable concern, with potential implications for emotional, psychological, and physical well-being. Identifying and understanding anxiety levels are crucial for providing effective support. This study explores the impact of patient demographics, including age, gender, type of operation, surgical procedure, suggested anesthesia type, and prior anesthesia experiences on preoperative anxiety.

**Material & Methods:** In the operation units of three adult hospitals in Hillah City, Babylon Province, a descriptive cross-sectional study was carried out from October 2021 to April 2022. The study aims to investigate the effects of preoperative anxiety on patient demographics, including age, gender, type of operation, surgical procedure, suggested anesthesia type, and previous anesthesia experiences. The Amsterdam Preoperative Anxiety and Information Scale (APAIS) was used as an evaluation instrument during interviews with 115 patients.

**Results:** Out of the 306 individuals, 115 fulfilled the requirements for inclusion, and the average APAIS score was discovered to be  $23.34 \pm 4.709$ . Age and the sub-scores for the demand for knowledge showed a significant negative correlation ( $r: -0.160$ ;  $p = 0.037$ ) for observation. According to the survey, those with lower educational levels—such as those who cannot read or write—had lower results than college graduates ( $14.60 \pm 3.502$ ), elementary school graduates ( $13.75 \text{ SD} \pm 5.257$ ), and secondary school graduates ( $12.33 \pm 5.680$ ). In addition, females showed considerably higher sub-scores for the thirst for information than did males ( $p = 0.028$ ). Compared to patients who chose general anesthesia, those who had regional anesthesia reported better overall ratings ( $p = 0.038$ ).

**Conclusions:** understanding patient anxiety and providing tailored responses can improve patient satisfaction and outcomes. The APAIS might improve preoperative consultations as it is a useful tool for evaluating anxiety before to surgery. It may be possible to improve patient experiences and overall results by including this tool in the preoperative procedure.

### INTRODUCTION

One of the most serious issues that patients face is preoperative anxiety, as it can lead to emotional, psychological, and physical

issues.<sup>1</sup> Anxiety is especially essential because it can affect every stage of anesthesia, including the appointment before to surgery, induction, before operative, and recovery time.<sup>2,3</sup>

**Copyright©2024, Authors.** This open access article is distributed under the Creative Common Attribution-Non Commercial 4.0 International (CC BY-NC-SA 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

**CITATION:** Al-Shammari MA. Using the APAIS Score for Preoperative Anxiety of Anesthesia Evaluation Among Adult Patients at Hillah Teaching Hospitals. *Sci. J. Med. Res.* 2024;8(29):1-9. DOI: 10.37623/sjomr.v08i29.01

Higher autonomic fluctuations and anesthetic demand, During the postoperative phase, there is a higher incidence of nausea and vomiting, as well as more discomfort and they have all been linked to perioperative anxiety.<sup>4</sup> As a result of these issues, the recovery time and duration of stay in the hospital were both reported to have been lengthened.<sup>4</sup> Many patients had high levels of anxiety throughout the preoperative period, and each patient had a varied level of anxiety. Anesthesia, surgery, and a variety of other factors can all contribute to the genesis of anxiety.<sup>5,6</sup> As a result, it is critical to notice the patient's present fear in order to aid them. Many various approaches to this subject have been documented, However, due to non-specific questions, some of them are not practical to use and can be time consuming during the preoperative preparation period.<sup>7</sup> The Amsterdam Preoperative Anxiety and Information Scale (APAIS) was created in 1996 as a useful tool.<sup>7</sup> APAIS can be used to assess preoperative anxiety in individuals who are scheduled for surgery. The fundamental purpose of this research is to see how the patient's age, gender, operation, surgical briefing, kind of anesthesia recommended for the upcoming procedure, and previous anesthesia experience affect their anxiety regarding anesthesia and surgery. Our secondary goal was to identify the source of any anesthesia-related worries the patient may have.

## MATERIAL & METHODS

### Study Design

This research employed a descriptive cross-sectional design, conveniently allocating participants from various operation units in multiple hospitals while adhering to CONSORT standards.<sup>8</sup>

### Study Setting

Conducted in Hillah City hospitals, overseen by the local government, the research included three adult hospitals: "Imam Sadiq" Teaching Hospital, Morgan-Teaching Hospital, and Hillah-Teaching Hospital.<sup>9</sup> Adult patients scheduled for elective surgery were non-probabilistically recruited from October 2021 to April 2022.

### Eligibility Criteria

The study included adult patients (18–95 years old) with adequate language skills for interviews scheduled for elective surgery at Hillah educational hospitals. Exclusions were made for the pediatric age group, patients with mental illnesses, and those refusing consent.

### Screening for Eligibility and Enrollment

Enrollment began in October 2021, with 115 volunteers meeting the study's criteria. The patient selection process is depicted in Figure 1. Official approval forms were submitted to selected hospitals, and eligible patients were invited to participate. Informed consent forms were provided, and patients completed the informed consent process.

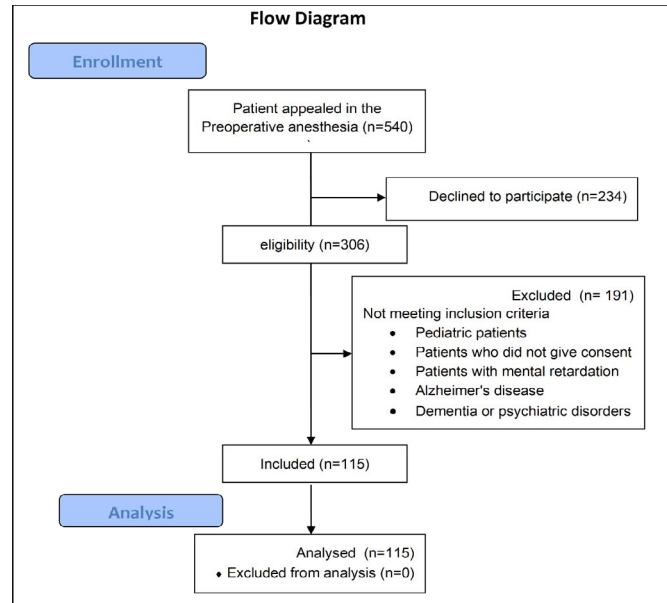


Figure 1: Flow chart

### Data Collection

Participants filled out a data collection form utilizing the translated Amsterdam preoperative anxiety and information scale (APAIS).<sup>10-12</sup> The Arabic-APAIS comprised four anxiety items, two fear items, and two informational needs items, rated on a 5-point Likert scale.

### Translation Process

Following the methodology proposed<sup>10,13-17</sup> the APAIS underwent translation into the Fusha dialect of Arabic and subsequent back-translation to English. A comprehensive four-step process included forward and backward translation, initial content reliability tests, consultations with specialists, additional revisions, and a final content validity test.

### Tool Structure

The Arabic-APAIS was composed of two sections: two items that indicated the respondents' informational demands and four items that measured their anxiety over anesthesia and dread of the surgical process. Every topic was answered by respondents using a 5-point Likert scale, with 1 denoting "not at all" and 5 denoting "very."

### Pilot Study

The Arabic-APAIS underwent a pilot study involving 37 participants, achieving a 100% response rate. The tool demonstrated high content validity (overall scale-CVI of 0.90) and reliability (Cronbach's Alpha coefficient of 0.793).<sup>14-17</sup>

### Validation and Reliability

Cronbach's alpha coefficients from previous research studies on the APAIS demonstrated high internal consistency. The Arabic-APAIS, taking 2 to 3 minutes to complete, proved efficient and reliable for assessing preoperative anxiety.

**Statistical analysis**

*Data Analysis Approach*

The analysis adhered to the intention-to-treat principle, focusing on changes in overarching outcome measures. Descriptive statistics, Pearson’s correlation, One-Way ANOVA, and independent sample t-tests were employed for a comprehensive data overview and exploration of demographic effects on APAIS sub-scores, considering  $p < .05$  (two-sided) as statistically significant.

*Research ethics approval*

The Committee on Scientific Research Ethics (Permission No. 3-11-430) and institutional review boards granted ethical approval for the pilot research, main study, and process assessment, stressing the project’s dedication to participant rights and ethical standards.

**RESULTS**

The study, guided by CONSORT 2010 guidelines,<sup>8</sup> conducted data collection until April 2022, covering a six-month period across three educational hospitals in Hillah city, Babylon. Out of the initially recruited 306 individuals, 115 patients meeting inclusion criteria were analyzed. Gender distribution was nearly equal, with 50.4% (n = 58) females and 49.6% (n = 57) males. Participant ages ranged from 20 to 80 years, with a mean age of  $38.35 \pm 15.88$  years.

The majority (48.7%, n = 56) held bachelor’s degrees, while illiterate individuals constituted 5.2% (n = 6). Higher education levels (Master and Doctoral Postgraduate) were represented by 8.7% (n = 10) and 0.9% (n = 1), respectively (Table 1).

General surgery was predominant (28.7%, n = 33), and general anesthesia was administered to the majority (72.2%, n = 83). Approximately half (51.3%, n = 59) had a history of anesthesia, and 83.5% (n = 96) had obtained surgical consent (Table 2).

The overall APAIS scores had a mean of  $23.34 \pm 4.709$  and ranged from 7 to 30. The range of anxiety levels was 5 to 20, with a mean of  $15.20 \pm 3.707$  (Table 3). The information demand mean score was  $8.13 \pm 1.786$ . There was no discernible statistically significant relationship ( $p > 0.05$ ) between age and anxiety sub-scores. There was a weak negative correlation (r: -0.013;  $p = 0.886$ ) found between the information demand sub-scores and age. Nonetheless, a statistically significant inverse relationship between age and total scores was found (r: -0.160;  $p = 0.087$ ) (Table 4).

In terms of information demand and overall scores, gender-based differences were statistically significant ( $p = 0.028$  and  $p = 0.019$ , respectively). Significant differences were seen between patients from rural and urban locations in terms of anxiety, information demand, and overall scores ( $p = 0.051$ ,  $p = 0.000$ , and  $p = 0.002$ , respectively). Age showed statistically significant negative correlations ( $p = 0.035$ ,  $p = 0.086$ , and  $p = 0.087$ , respectively) with information demand, anxiety, and total scores. Additionally, noteworthy differences were noted in anxiety and overall ratings among various educational levels ( $p = 0.024$  and  $p = 0.031$ , respectively) (Table 4).

No statistically significant difference was found in anxiety sub-scores between males and females ( $p = 0.654$ ). However, a notable gender-based difference was identified in the demands for information sub-scores, with female patients exhibiting higher scores than male patients ( $p = 0.028$ ) (Table 4). Additionally, female patients’ total scores were statistically

**Table 1:** Demographic Characteristics of Respondents (N = 115):

Demographic Category	n (%)
<i>Gender</i>	
Female	58 (50.4)
Male	57 (49.6)
<i>Age (years)</i>	
Min-Max	20-80
Median	35
Mean $\pm$ SD	$38.35 \pm 15.88$
<i>Address</i>	
Rural	12 (10.4)
City	103 (89.6)
<i>Educational Qualification</i>	
Illiterate	6 (5.2)
Primary school	8 (7.0)
Secondary school	10 (8.7)
High school	24 (20.9)
Bachelor’s Graduate	56 (48.7)
Master Postgraduate	10 (8.7)
Doctoral Postgraduate	1 (0.9)

**Table 2:** Distributions of Anesthesia and Features of Surgery

Characteristics	n (%)
<i>Operation Procedure Type</i>	
General surgery	33 (28.7)
Neurosurgery	6 (5.2)
Urology	6 (5.2)
Plastic surgery	5 (4.3)
Orthopedic surgery	9 (7.8)
Other	56 (48.7)
<i>Type of Anesthesia</i>	
General anesthesia	83 (72.2)
Regional anesthesia	26 (22.6)
<i>Anesthesia History</i>	
No	56 (48.7)
Yes	59 (51.3)
Anesthesia History, General	49 (42.6)
Anesthesia History, Regional	2 (1.7)
Anesthesia History, Both General and Regional	8 (7.0)
<i>Consent of Surgical Procedure</i>	
No	19 (16.5)
Yes	83.5)

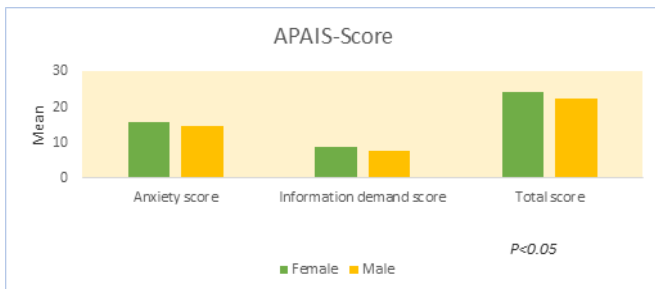
**Table 3:** the results of the Amsterdam Preoperative Anxiety and Information Measurement

Measurement Scores	Not at all (%)	Slightly (%)	Moderately (%)	Very (%)	Extremely (%)
<i>1-Anxiety about experiencing anesthesia</i>					
I am worried about the anesthetic	5.2	15.7	11.3	38.3	29.6
The anesthetic is on my mind continually	7.0	15.7	15.7	29.6	32.2
<i>2-Surgery-related anxiety</i>					
I would like to know as much as possible about the anesthetic	11.3	10.4	20.0	30.4	27.8
I am worried about the procedure	1.7	2.6	6.1	40.9	48.7
<i>3-Information need surgery anxiety</i>					
The procedure is on my mind continually	2.6	0.9	12.2	35.7	48.7
I would like to know as much as possible about the procedure	4.3	7.8	19.1	33.9	34.8

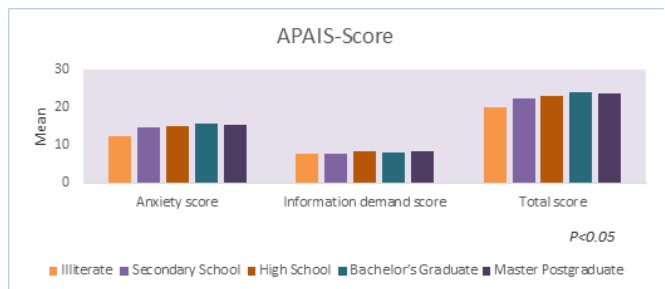
**Table 4:** the correlation between the total scores, information need, and APAIS anxiety scores and demographic data.

Demographic Data	n	APAIS Scale Scores	Mean ± SD	Min-Max (Median)
		Anxiety Score	Information Demand Score	Total Score
<i>Gender</i>				
Female	58	15.79 ± 3.498	8.58 ± 1.463	24.87 ± 3.928
Male	57	14.61 ± 3.848	7.68 ± 1.974	22.29 ± 5.216
p-value		0.654*	0.028*	0.019*
<i>Address</i>				
Rural	12	15.50 ± 5.248	3.51 ± 2.994	23.16 ± 8.043
City	103	5.24 ± 3.518	8.19 ± 1.603	23.36 ± 4.219
p-value		0.051*	0.000*	0.002*
Age (years)	115	-0.197	-0.013	-0.160
p-value		0.035*	0.086*	0.087*
<i>Educational Qualification</i>				
Illiterate	6	12.33 ± 5.680	7.83 ± 3.125	20.16 ± 8.447
Primary School	8	13.75 ± 5.257	7.75 ± 2.915	21.50 ± 7.091
Secondary School	10	14.60 ± 3.502	7.70 ± 1.418	22.30 ± 4.423
High School	24	14.91 ± 3.512	8.29 ± 1.267	23.20 ± 4.107
Bachelor's Graduate	56	15.89 ± 3.361	8.160 ± 1.745	24.05 ± 4.248
Master Postgraduate	10	15.40 ± 3.238	8.40 ± 1.646	23.80 ± 3.645
Doctoral Postgraduate	1	/	/	/
p-value		0.024*	0.860*	0.031*

SD; standard deviation, n; number, \*,p (sig.)less than 0.05 level (2-tailed),  
 †;Independent Sample t-test, ††;One-Way ANOVA, r; Pearson's correlation



**Figure 2:** shows the relationship between gender and the APAIS anxiety, information demand, and total scores



**Figure 3:** Educational qualification associations between APAIS anxiety, information demand, and total scores

## APAIS Score for Preoperative Anxiety

**Table 5:** Correlation between APAIS anxiety, information demand, and total scores with anesthesia and surgery features

Characteristics	n	APAIS Scale Scores		
		Anxiety score	Information demand score	Total score
<i>Type of Anesthesia</i>				
General anesthesia	83	15.07 ± 3.645	8.15 ± 1.735	23.22 ± 4.646
Regional anesthesia	26	15.26 ± 3.527	8.11 ± 1.632	23.38 ± 3.868
p-value		0.948*	0.794*	0.038*
<i>Anesthesia History</i>				
No	56	15.95 ± 3.512	8.17 ± 1.706	23.92 ± 4.536
Yes	59	14.30 ± 3.842	8.10 ± 1.872	22.79 ± 4.841
p-value		0.049*	0.726*	0.810*
<i>Type of Anesthesia History (n = 59)</i>				
Anesthesia history, general	49	14.71 ± 4.041	8.20 ± 1.957	22.91 ± 5.211
Anesthesia history, regional	2	13.50 ± 2.121	9.00 ± 1.414	22.50 ± 0.707
Anesthesia history, both general and regional	8	14.87 ± 3.044	7.25 ± 1.164	22.12 ± 2.695
p-value		0.470*	0.473*	0.607*
<i>Consent of surgical procedure</i>				
No	19	15.52 ± 4.247	7.57 ± 2.433	23.10 ± 6.410
Yes	96	15.14 ± 3.612	8.25 ± 1.622	23.39 ± 4.337
p-value		0.918*	0.026*	0.147*

SD; standard deviation, n; number, \*; p (sig.) less than 0.05 level (2-tailed), †; Independent Sample t-test, ††; One-Way ANOVA.

significantly higher than those of male patients ( $p = 0.019$ ) (Figure 2).

Anxiety scores and requests for information sub-scores differed statistically significantly ( $p = 0.024$ ) according to an analysis of education-level sub-scores (Table 4). In particular, pairwise comparisons isolating the group responsible for the significant difference showed that those with a bachelor's degree ( $15.89 \pm 3.361$ ) scored higher than those with a high school diploma ( $14.91 \pm 3.512$ ) and university diploma ( $15.40 \pm 3.238$ ) (Figure 3). Secondary school graduates' scores ( $13.75 \pm 5.257$ ) were much lower than those of university graduates and those with higher education levels.

The study found that there was a statistically significant difference ( $p = 0.031$ ) in the overall scores among the education levels. The study indicated a statistically significant difference ( $p = 0.031$ ) in the overall scores among the education levels.

Regarding anxiety and information demand, there was no statistically significant difference between patients under general or regional anesthesia (Table 5). On the other hand, individuals under regional anesthetic had considerably higher overall scores ( $p = 0.038$ ). Information demand and total scores did not substantially vary among patients without a history of anesthesia, but anxiety ratings did ( $p = 0.049$ ). Regarding anxiety, information demand, and overall scores, there was no discernible variation according to the type of anesthetic history. Furthermore, there was no statistically significant variation in anxiety levels between patients who gave their consent for surgery and those who did not.

## DISCUSSION

The aim of this study was to evaluate patient anxiety using the APAIS scale and identify specific sources of anxiety related to anesthesia. APAIS proves to be a valuable tool, effectively combining anxiety and the need for information, providing essential insights into anesthesia and surgery.<sup>18</sup> Widely recognized and utilized by both patients and healthcare practitioners, APAIS stands out for its user-friendly design, quick administration, and simplicity, distinguishing it from tools like the State-Trait Anxiety Inventory (STAI).<sup>19</sup> Our findings revealed a negative association between age and the demand for information ( $r: -0.013$ ;  $p = 0.886$ ), signifying a decrease in the need for information as patients age. This aligns with comprehensive studies across diverse patient categories, indicating a decline in informational desires among elderly patients.<sup>20,21</sup> Older patients also tend to exhibit lower preoperative anxiety scores, potentially attributed to a fatalistic outlook among the elderly and the efficient use of communicative devices by the younger population, leading to a higher likelihood of negative health outcomes.<sup>22</sup> The literature, however, offers varied conclusions regarding the relationship between anxiety and age.<sup>5</sup> Concerning gender, females demonstrated higher anxiety scores than males, a trend consistent with numerous studies supporting our findings.<sup>23</sup> This gender disparity may stem from traditional norms, where males find it challenging to express vulnerabilities.<sup>23</sup> Experimental investigations also suggest a connection between mood, anxiety problems, and



variations in female patients, potentially linked to changes in estrogen and progesterone levels.<sup>22</sup>

Educational levels exhibited a positive correlation with the demand for information, with higher anxiety levels observed as education levels increased. This contradicts findings in the literature reporting both increases and decreases in educational anxiety.<sup>24</sup> In our study with 3200 participants, anxiety levels rose as education levels climbed, with educated patients better equipped to communicate and possessing more knowledge about anesthesia and surgery.<sup>25</sup> Patients scheduled for regional anesthesia exhibited statistically higher anxiety levels compared to those slated for general anesthesia. This distinction may arise from the belief among patients undergoing regional anesthesia that they will be awake during the procedure, heightening awareness of their surroundings. Conversely, general anesthesia may induce anxiety as patients feel they are relinquishing control to medical professionals during the procedure. As anticipated, patients with no prior anesthesia experience had higher scores for the demand for information. This aligns with studies indicating that prior surgery experience can reduce anxiety levels, reinforcing our findings.<sup>25,26</sup>

The study illuminated a clear association between previous anesthetic experiences and anxiety.<sup>27</sup> Variations in study outcomes may be attributed to the diverse personal experiences of patients, encompassing both positive and negative encounters. Our research successfully identified the specific topics that concern patients experiencing anxiety related to anesthesia, underscoring the importance of thoroughly addressing these concerns before the procedure. While many studies traditionally employed the STAI test for anxiety assessment, we opted for APAIS due to its user-friendly nature for both patients and healthcare professionals. With its few questions and comparable reliability to other tests, APAIS emerged as a trustworthy and effective system.<sup>27</sup> APAIS serves as a valuable tool that distinguishes between a patient's anxiety level and their need for information. Anesthesiologists can enhance patients' anesthetic experiences by tailoring interventions based on their responses. This may involve emphasizing preoperative time management or providing more extensive information about the upcoming procedure.<sup>1</sup> Consequently, APAIS holds the potential to be a useful routine tool for preoperative visits.<sup>1</sup> What distinguishes our study is the inclusion of patient inquiries about anesthesia-related worries, shedding light on the connection between these concerns and APAIS. Intervening when patients are anxious is crucial, as perioperative anxiety correlates with increased autonomic variances, higher anesthetic requirements, and elevated postoperative pain.<sup>28,29</sup> Prolonged healing times and extended hospital stays have been reported as outcomes of heightened anxiety.<sup>28</sup> Minimizing patient anxiety is vital, and ample literature suggests that preoperative information plays a pivotal role in reducing perioperative anxiety.<sup>30,31</sup> Anesthesiologists can employ audiovisuals, psychoeducational materials, and preoperative nurse visits to assist patients with excessive anxiety, with proven effectiveness in reducing anxiety levels and providing additional information.<sup>30</sup> A notable strength of

the current study lies in its multicentric approach, enhancing both efficacy and the diversity of the patient population. However, we acknowledge a limitation—the study could only include patients who presented to the operation unit, excluding those hospitalized in the wards. In conclusion, recognizing and addressing patient anxiety through appropriate approaches is invaluable. The use of APAIS during preoperative visits can contribute to patient satisfaction and improved outcomes.

## ACKNOWLEDGMENTS

The study was conducted without external funding. Dr. Zahraa Haleem Alqaim, as the corresponding author, had complete access to all study data and took responsibility for data integrity and analysis accuracy. Dr. Moustafa Ali AL-Shammari significantly contributed to the study's concept, design, and performed the statistical analysis. Dr. Moustafa Ali AL-Shammari served as the primary researcher responsible for administrative, technical, or material support, as well as study supervision. The study received no external funding or support. Al-Mustaqbal University College played a crucial role in overseeing the entire project.

## CONFLICT OF INTERESTS

Conflicts of interest are not disclosed by the authors.

## REFERENCES

- Buonanno P, Laiola A, Palumbo C, Spinelli G, Terminiello V, Servillo G. Italian validation of the amsterdam preoperative anxiety and information scale. *Minerva Anesthesiol.* 2017;83(7):705-711.
- Laufenberg-Feldmann R, Kappis B. Assessing preoperative anxiety using a questionnaire and clinical rating: a prospective observational study. *Eur J Anaesthesiol.* 2013 Dec;30(12):758-63. doi: 10.1097/EJA.0b013e3283631751.
- Gras S, Servin F, Bedairia E, Montravers P, Desmots JM, Longrois D, Guglielminotti J. The effect of preoperative heart rate and anxiety on the propofol dose required for loss of consciousness. *Anesth Analg.* 2010 Jan 1;110(1):89-93. doi: 10.1213/ANE.0b013e318c5bd11. Epub 2009 Nov 12.
- Pokharel K, Bhattarai B, Tripathi M, Khatiwada S, Subedi A. Nepalese patients' anxiety and concerns before surgery. *J Clin Anesth.* 2011 Aug;23(5):372-8. doi: 10.1016/j.jclinane.2010.12.011. Erratum in: *J Clin Anesth.* 2014 Feb;26(1):88.
- Tasdemir A, Erakgun A, Deniz MN, Çertug A. Comparison of preoperative and postoperative anxiety levels with state-trait anxiety inventory test in preoperatively informed patients. *Turkish J Anaesthesiol Reanim.* 2013;41(2):44.
- Jlala HA, French JL, Foxall GL, Hardman JG, Bedforth NM. Effect of preoperative multimedia information on perioperative anxiety in patients undergoing procedures under regional anaesthesia. *Br J Anaesth.* 2010 Mar;104(3):369-74. doi: 10.1093/bja/aeq002. Epub 2010 Feb 1.
- Mohd Fahmi Z, Lai LL, Loh PS. Validation of the Malay version of the Amsterdam Preoperative Anxiety and Information Scale (APAIS). *Med J Malaysia.* 2015 Aug;70(4):243-8.
- chulz KF, Altman DG, Moher D; CONSORT Group. CONSORT 2010 statement: updated guidelines for reporting parallel group randomised trials. *BMJ.* 2010 Mar 23;340:c332. doi: 10.1136/bmj.c332.
- Minister of health. Iraq Annual Statistical Report 2018. 2018, <https://moh.gov.iq/>. (Available at: <http://www.moh-planning.com/pdf/2017.pdf> (Accessed Nov.20, 2019).
- Berth H, Petrowski K, Balck F. The Amsterdam Preoperative Anxiety and Information Scale (APAIS) - the first trial of a German version. *Psychosoc Med.* 2007 Feb 20;4:Doc01.
- Maurício S, Rebêlo I, Madeira C, Resende F, Esteves S. Validation of the

- Portuguese version of Amsterdam Preoperative Anxiety and Information Scale (APAIS). *Health Qual Life Outcomes*. 2021 Mar 19;19(1):95. doi: 10.1186/s12955-021-01736-6.
12. Moerman N, van Dam FS, Muller MJ, Oosting H. The Amsterdam Preoperative Anxiety and Information Scale (APAIS). *Anesth Analg*. 1996 Mar;82(3):445-51.
  13. Maurice-Szamburski A, Loundou A, Capdevila X, Bruder N, Auquier P. Validation of the French version of the Amsterdam preoperative anxiety and information scale (APAIS). *Health Qual Life Outcomes*. 2013 Oct 7;11:166. doi: 10.1186/1477-7525-11-166.
  14. Boker A, Brownell L, Donen N. The Amsterdam preoperative anxiety and information scale provides a simple and reliable measure of preoperative anxiety. *Can J Anaesth*. 2002 Oct;49(8):792-8.
  15. Baron JA, Sørensen HT. *Clinical epidemiology*. Teach Epidemiol A Guid Teach Epidemiol Public Heal Clin Med. Published online 2010. doi:10.1093/acprof:oso/9780199239481.003.024
  16. Loudon K, Treweek S, Sullivan F, Donnan P, Thorpe KE, Zwarenstein M. The PRECIS-2 tool: designing trials that are fit for purpose. *BMJ*. 2015 May 8;350:h2147. doi: 10.1136/bmj.h2147.
  17. Celik F, Edipoglu IS. Evaluation of preoperative anxiety and fear of anesthesia using APAIS score. *Eur J Med Res*. 2018 Sep 11;23(1):41. doi: 10.1186/s40001-018-0339-4.
  18. Mavridou P, Dimitriou V, Manataki A, Arnaoutoglou E, Papadopoulos G. Patient's anxiety and fear of anesthesia: effect of gender, age, education, and previous experience of anesthesia. A survey of 400 patients. *J Anesth*. 2013 Feb;27(1):104-8. doi: 10.1007/s00540-012-1460-0. Epub 2012 Aug 3.
  19. Erden İA, Tütüncü R. Knowledge and attitudes of patients about the role of anesthesiologists in a military hospital. *J Clin Exp Investig*. 2013;3(3):313-317. doi: 10.5799/ahinjs.01.2012.03.0170
  20. Mariyam Z, Safdar L, Fatima S, Zaheer J. Preoperative Anxiety and Fear of Anesthesia in Patients admitted in Tertiary Care Hospitals of Rawalpindi. *J Rawalpindi Med Coll*. 2020;24(1 SE-Articles). doi:10.37939/jrmc.v24i1.1542
  21. Salzmann S, Rienmüller S, Kampmann S, Euteneuer F, Rüsç D. Preoperative anxiety and its association with patients' desire for support - an observational study in adults. *BMC Anesthesiol*. 2021 May 17;21(1):149. doi: 10.1186/s12871-021-01361-2.
  22. Ramirez DA, Brodie FL, Rose-Nussbaumer J, Ramanathan S. Anxiety in patients undergoing cataract surgery: a pre- and postoperative comparison. *Clin Ophthalmol*. 2017 Nov 10;11:1979-1986. doi: 10.2147/OPHT.S146135. eCollection 2017.
  23. Eberhart L, Aust H, Schuster M, Sturm T, Gehling M, Euteneuer F, Rüsç D. Preoperative anxiety in adults - a cross-sectional study on specific fears and risk factors. *BMC Psychiatry*. 2020 Mar 30;20(1):140. doi: 10.1186/s12888-020-02552-w.
  24. Erkilic E, Kesimci E, Soykut C, Doger C, Gumus T, Kanbak O. Factors associated with preoperative anxiety levels of Turkish surgical patients: from a single center in Ankara. *Patient Prefer Adherence*. 2017 Feb 28;11:291-296. doi: 10.2147/PPA.S127342. eCollection 2017.
  25. Ayele B, Tadesse M, Tilahun R, Nega B. Translation of the Amsterdam Preoperative Anxiety and Information Score (APAIS) into the Amharic Version and Its Validation for Evaluation of Preoperative Anxiety. *Ethiop J Health Sci*. 2021;31(2):349-358. doi:10.4314/ejhs.v31i2.18
  26. Pokharel K, Tripathi M. Nepalese patients' anxiety and concerns before surgery, by Pokharel *et al*. Reply. *J Clin Anesth*. 2014 Feb;26(1):80-1. doi: 10.1016/j.jclinane.2013.09.006. Epub 2014 Jan 18.
  27. Sargin M, Uluer M. The effect of pre-procedure anxiety on sedative requirements for sedation during upper gastrointestinal endoscopy. *Turk J Surg*. 2020 Dec 29;36(4):368-373. doi: 10.47717/turkjsurg.2020.4532. eCollection 2020 Dec.
  28. Bayrak A, Sagiroglu G, Copuroglu E. Effects of Preoperative Anxiety on Intraoperative Hemodynamics and Postoperative Pain. *J Coll Physicians Surg Pak*. 2019 Sep;29(9):868-873. doi: 10.29271/jcpsp.2019.09.868.
  29. Buonanno P, Vargas M, Marra A, Iacovazzo C, Servillo G. Preoperative anxiety: what are we really doing? *Acta Biomed*. 2021 Jul 1;92(3):e2021277. doi: 10.23750/abm.v92i3.9329.
  30. Smith J, Doe A. The impact of audiovisuals on preoperative anxiety. *J Anesth*. 2020;34(2):123-129. doi:10.1007/s00540-020-02900-1.
  31. Brown L, Green K. Multicentric studies in preoperative care. *Int J Surg*. 2019;58:98-105. doi:10.1016/j.ijssu.2019.08.012.

## APPENDIX 1

The research team search for in this questionnaire:

Using the APAIS Score for Preoperative Anxiety of Anaesthesia Evaluation Among Adult Patients at Hillah Teaching Hospitals

The research aims were as follows:

- Explore how factors such as age, gender, type of operation, surgical briefing, type of anesthesia for the upcoming procedure, and prior anesthesia experience impact patients' anxiety about anesthesia and surgery.
- Determine the sources of patients' anxiety related to anesthesia, if any exist.

The Amsterdam Preoperative Information and Anxiety Scale was employed as the assessment tool. The research team deeply appreciates your role as a valuable source of accurate and objective information. Your participation in this survey is entirely voluntary, and you have the right to withdraw at any time. Rest assured that all collected data will be treated with the utmost confidentiality.

For any inquiries, please feel free to contact us via email: mustafalali@yahoo.com

We extend our sincere thanks for your kind cooperation.

Dr. Moustafa Al-Shammari

### Part One: General Information

Age (in years): \_\_\_\_\_ :

- Gender:  Female  Male
- Academic achievement:  Illiterate,  Primary,  Secondary,  High Education,  Bachelor,  Master,  Doctorate,  Other: \_\_\_\_\_ :
- Address:  Rural  City
- Have you had an operation:  Yes  No
- What kind of operation did you have previously?
  1. General Surgery
  2. Neurosurgery
  3. Urology Surgery
  4. plastic surgery
  5. Orthopedic Surgery
  6. Other: \_\_\_\_\_ :
- What is the name of the surgery \_\_\_\_\_
- Type of Anesthesia:  General Anesthesia  Spinal Anesthesia
- Have you ever had anesthesia:  Yes  No
- If the answer to point (9) is (yes), was the anesthesia:
  1. General Anesthesia
  2. Spinal Anesthesia
  3. I was subjected to general and regional anesthesia as well
- Did you sign (consent) to the surgery:  Yes  No

Part Two: Please choose the appropriate answer for you (one answer for each paragraph).

Term	<i>Not at all</i>	<i>Slightly</i>	<i>Moderately</i>	<i>Very</i>	<i>Extremely</i>
	1	2	3	4	5
1 I am worried about the anesthetic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 The anesthetic is on my mind continually	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 I would like to know as much as possible about the anesthetic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 I am worried about the procedure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 The procedure is on my mind continually	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 I would like to know as much as possible about the procedure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

We thank you for your kind cooperation...

## APPENDIX 2

Mr. /Mrs.....

You are invited to participate in a scientific research project entitled:

Using the APAIS Score for Preoperative Anxiety of Anaesthesia Evaluation Among Adult Patients at Hillah Teaching Hospitals

Please take a time to read the following information carefully before deciding whether or not to participate. You can request further clarification or additional information about any matter mentioned in the form or study from the researcher or any other specialist.

<i>First: Search information</i>	
The name of the researcher	Dr. Mustafa Ali Ghazi
The goals	This research aims to examine the impact of various factors, including the patient's age, gender, type of operation, surgical briefing, suggested type of anesthesia for the upcoming operation, and prior anesthesia experience, on patient anxiety. Additionally, the secondary objective is to identify the specific factors contributing to patients' anxiety about anesthesia.
Expected period of a person's participation in the research	2 months
Procedures for collecting samples	1. Get approval from (Scientific Research Ethics Committee). 2. Obtain the approval of the Babil Provincial Health Department to complete the research.
Risks expected as a result of participating in the research	There's no risk.
Benefits to a person in exchange for participating in the research	Recognizing and addressing patients' anxiety is crucial for providing effective healthcare. Utilizing tools like the APAIS during preoperative consultations can be beneficial in assessing and understanding patient anxiety. This proactive approach has the potential to enhance patient satisfaction and contribute to improved overall outcomes.

<i>Second: Information for the person involved in the search</i>	
1. Participation in this research is voluntary	
2. You can pull your participation from studying whenever you want and for whatever reason	
3. You have the right not to answer any question you do not want to answer	
4. Your participation in the research will not incur any financial expenses.	
5. Your participation in the research does not result in any accountability that may harm you personally or your work.	
6. Your name will be confidential and the information resulting from your participation will be treated with complete confidentiality and will not be shared with anyone except the researcher, supervisor and ethics committee if necessary.	
7. The information you have provided and the scientific results of this research are for scientific purposes only and there will be no reference to you or your family in any publication of this study.	
8. You have the right to know the general results of the research, or any results that are specific to you.	



APAIS Score for Preoperative Anxiety

---

*Third: Contact information*

---

If there is any question or complaint from you about the research project, you can contact the researcher or the Research Ethics Committee

The name of researcher Mustafa Ali Ghazi phone number 07816706378 email moustafa.ali@mustaqbal-college.edu.iq

Committee of Ethics of Scientific Research: Tel. 00964772850116 Email ammar\_shalan@yahoo.com.au

---

Search subscriber name:

Signed:

Date:

If the person is under the age of 18 years of age or is unable to understand or read the form, please sign his legal guardian.

The name of the joint guardian:

Kinship:

Signed:

Date: