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Measures of preoperative anxiety: Part two

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Abstract

The current literature indicates that routine evaluation of preoperative anxiety, its determinants, and patient-specific concerns is universally advocated. This aligns with the increasingly acknowledged importance of prehabilitation – a comprehensive process preparing patients for surgery. A crucial component of prehabilitation is assessing patients' mental health. Recommendations for psychological evaluations in prehabilitation encompass, inter alia, determining the severity of anxiety. This work builds on a 2019 article, which presented scales for preoperative anxiety assessment: the State Trait Anxiety Inventory (STAI), the Hospital Anxiety and Depression Scale (HADS), the Amsterdam Preoperative Anxiety and Information Scale (APAIS), and the Visual Analogue Scale (VAS). This article extends the possibilities of preoperative anxiety assessment by introducing four additional methods: the Surgical Fear Questionnaire (SFQ), the Anxiety Specific to Surgery Questionnaire (ASSQ), the Surgical Anxiety Questionnaire (SAQ), and Anesthesia- and Surgery-dependent Preoperative Anxiety (ASPA). The authors provide comprehensive details on these instruments, including scoring, interpretation, availability, and usefulness both in scientific research and clinical practice. The authors also provide the data on the availability of Polish versions of the presented methods and preliminary data on the reliability of SFQ in patients awaiting cardiac surgery. This review seems relevant for professionals in multiple disciplines, including anesthesiology, surgery, clinical psychology, nursing, primary care and notably prehabilitation. It emphasizes the necessity of individualizing anxiety assessment and acknowledging patient subjectivity, which the presented methods facilitate through a thorough evaluation of specific patient concerns. The literature review also identifies concerns and future research avenues in this area. The importance of qualitative studies and those evaluating prehabilitation intervention is emphasized.

Key words: preoperative anxiety, assessment methods, prehabilitation, patient reported outcomes.

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Recent literature consistently advocates for the routine assessment of preoperative anxiety, its contributing factors, and specific fears and expectations of patients undergoing surgical procedures. This approach aligns particularly with the contemporary understanding of the importance of prehabilitation, as an element that offers measurable benefits. These benefits include improvements in the psychological state of patients qualified for surgical treatment, their quality of life, reduction in the number of postoperative complications, shortened hospitalization and convalescence, and enhanced treatment outcomes. This encompasses issues such as rehospitalization, reoperation, treatment costs, as well as morbidity and mortality [1–5]. Recommendations regarding prehabilitation mandate the assessment of mental state, particularly the intensity of anxiety and depression, and the strengthening of motivation and self-efficacy [1, 3, 6–10]. Arora *et al*. [10] highlighted three dimensions of prehabilitation, expressed in the acronym NEW: nutrition, exercise, and worry. The methods presented, both in the previous [11] and in this publication, seem particularly useful in the aspect of the rapidly developing multidisciplinary field of prehabilitation, due to their comprehensive range of potential concerns assessed.

Another aspect emerging from the review of the literature is the issue of how and what information is conveyed to patients, which still seems to pose a challenge [12]. Recommendations also remain current regarding the search for effective

interventions to reduce the intensity of anxiety, stress, or worry, adversely affecting many factors related to surgical treatment [13–15]. There is a call for individualization in the process of informing and preparing for surgery, considering specific needs and fears, individual information requirements, and characteristics specific to certain groups of surgical patients. This is due to the vast diversity of procedures, differences in their extent and risk level, and the specifics of the convalescence process. The necessity of considering the individual perspective of the patient and empowering patients is also emphasized [3, 5, 16]. Thus, in the multidimensional understanding of the patient's perspective in perioperative medicine, anesthesiology, surgery and prehabilitation, standardized methods for assessing preoperative anxiety, concerns about the procedure and convalescence, as well as defining informational needs, are essential.

This article is the second part of a work presenting scales for assessing preoperative anxiety published in 2019 [11], which introduced selected scales such as the State-Trait Anxiety Inventory (STAI), the Hospital Anxiety and Depression Scale (HADS), the Amsterdam Preoperative Anxiety and Information Scale (APAIS), and the Visual Analogue Scale (VAS). The current publication enriches the previously presented tools with the characteristics of four additional scales, expanding the possibilities for clinicians to select an instrument tailored to the needs of the specific population or the purpose of scientific research. These scales not only assess the intensity of anxiety, but also specific fears related to surgical treatment.

Given that most patients experiencing high anxiety on the day prior to surgery also exhibit high anxiety at the decision-making stage and during the week preceding the procedure [17], these scales can and should be used at every stage of preparing a patient for surgery. This includes primary healthcare (PHC), anesthesiology and prehabilitation outpatient clinics, and up to the stage just before the procedure, on the day of hospitalization or the day before surgery. It is also worth noting that these methods can be utilized by all specialists involved in treatment (general practitioner, anesthesiologist, surgeon, psychologist, nurse, physiotherapist, dietitian). Below, four questionnaires are presented in detail: the Anxiety Specific to Surgery Questionnaire (ASSQ), the Surgical Fear Questionnaire (SFQ), the Surgical Anxiety Questionnaire (SAQ), and the Anesthesia- and Surgery-dependent Preoperative Anxiety (ASPA) questionnaire. Detailed information about these tools is provided in Table 1.

THE ANXIETY SPECIFIC TO SURGERY QUESTIONNAIRE

The Anxiety Specific to Surgery Questionnaire (ASSQ) (Polish: *Kwestionariusz Lęku Specyficznego dla Zabiegu Chirurgicznego*) consists of 10 items and was developed based on interviews with patients and staff (surgeons, nursing staff) at a trauma surgery clinic [18]. The statements in the ASSQ scale primarily concern fears of pain, death, complications, and limitations that may occur in the distant postoperative period. Patients are asked to respond to each item on a five-point Likert scale, where "1" means "strongly disagree" and "5" means "strongly agree". For item 8 of the test, reverse scoring is applied, and then the total score is calculated. The maximum score on the scale is 50 points, and the minimum is 0 points. A higher score indicates a higher intensity of anxiety. To date, no cutoff point has been established in the ASSQ test to indicate clinically significant anxiety. The test has satisfactory psychometric properties (Cronbach's α coefficient in the original study was 0.79) [18]. The scale has been used in several recently published studies involving patients undergoing various surgical procedures, mainly in Turkey [15, 19–27]. After obtaining permission from the authors of the original version of the questionnaire, we translated it into Polish according to the principles of adaptation of psychometric methods: translation from English to Polish independently by three clinicians (including a clinical psychologist and two physicians), agreement on a common Polish version, translation from Polish to English by a native English speaker who is also fluent in Polish and who was not familiar with the original version, further consultations with the team of clinicians, comparison of the back-translation version with the original version, and conducting a pilot study among 10 patients (see Supplement 1 file for the English (Table 1) and Polish (Table 2) versions of ASSQ). The reliability study of the Polish version of the scale in the population of cardiac surgery patients is ongoing. The scale can be used in research and clinical practice free of charge after obtaining permission from its authors [18].

THE SURGICAL FEAR QUESTIONNAIRE

The Surgical Fear Questionnaire (SFQ) (Polish: *Lęk przed Operacją*), developed by Theunissen *et al*. [28, 29], consists of 8 statements related to short- and long-term fears associated with surgical procedures. The respondents are asked to rate the intensity of their anxiety regarding each aspect on a numerical scale from 0, indicating "no fear at all," to 10, "very afraid." Items 1–4 form the subscale "Fear of Short-term Aspects of Surgery," and items 5–8 constitute the subscale "Fear of Long-term Aspects

TABLE 1. Detailed characteristics of the described scales assessing preoperative anxiety

	ASSQ	SFQ	SAQ	ASPA
Time to complete	Approx. 3–5 min.	Approx. 3–5 min.	Approx. 10 min.	Approx. 5 min.
Characteristics	10 items	8 items. Two subscales: items 1–4 related to short-term aspects of surgery; items 5–8 related to long-term aspects of surgery	17 items in the original version	8 items
Range of scores	0–50 points Reversed score in item 8	0–40 points for each subscale 0–80 points for the entire scale	0–68 points	1–40 points
Interpretation	Higher score reflects higher intensity of anxiety			
Cutoff point for clinically significant level of anxiety	Not established	Not established	Not established	Not established
Major advantages	Contains statements regarding surgery, possible complications, and surgery results. Short and easy to complete. Available free of charge (authors' permission required).	Assesses worries related to short-term and long-term aspects of surgery. Short and easy to complete. Available free of charge (authors' permission required).	The most comprehensive assessment of concerns regarding surgery. No information on test availability.	Contains questions regarding postoperative cognitive functioning. English version is published [54].
Major limitations	Note the reversed scoring in item 8.	Related only to scoring rules [see: Table 2].	Longer time to complete. Difficulty of filling in for elderly patients.	Not validated to date.
Application in research in anesthesiology and surgery	Very useful	Very useful	Very useful	Very useful in conjunction with general anxiety scale.
Main applications	Anesthesiology, prehabilitation, clinical psychology in surgery, surgery, nursing			
Prospective evaluation, monitoring the level of anxiety	Useful for planning presurgical education in prehabilitation, preparing for planned surgery, and assessment of effectiveness of educational intervention including specific concerns of patient and family members			

ASSQ – Anxiety Specific to Surgery Questionnaire (Polish: *Kwestionariusz Lęku Specyficznego dla Zabiegu Chirurgicznego*), SFQ – Surgical Fear Questionnaire (Polish: *Kwestionariusz Lęk przed Operacją*), SAQ – Surgical Anxiety Questionnaire (Polish: *Kwestionariusz Lęku Chirurgicznego*), ASPA – Anaesthesia- and Surgery-dependent Preoperative Anxiety

TABLE 2. Instructions for data entry and data cleaning in the Surgical Fear Questionnaire (SFQ)*

SFQ: Instructions for researchers:
1. If the respondent marks two values for one item:
- If these are adjacent values, the highest value should be recorded.
- If there are intermediate values between them, it should be treated as "missing".
2. For calculating the subscale scores, no missing is allowed.
3. If the total score is used (item 1–8) a missing response in a maximum of one item is permissible. It can be replaced by the subject's mean score. If there are missing responses for more than one item of the scale, the total score should not be considered.
4. Scores are calculated by summing the results for the subscales (1–4; 5–8) and for the entire scale (1–8).

* Based on instructions for researchers provided by authors of the scale.

of Surgery". The range of possible scores for each subscale is from 0 to 40 points, and for the entire scale (items 1–8), from 0 to 80 points. The higher the score on the scale, the greater is the intensity of preoperative anxiety. The scale is straightforward, but careful data entry and cleaning are necessary – detailed instructions from the authors of the scale are included in Table 2. It seems that issues with missing data can be avoided by carefully analyzing the test with the patient and asking for corrections of any mistakes or filling in any gaps. The detailed requirements for calculating the SFQ scores undoubtedly constitute its advantage, as they ensure high reliability of the data obtained. The discussed questionnaire has satisfactory psychometric properties, allowing for its use both in clinical practice and scientific research [28–33].

The Polish version of the scale was prepared by our team after obtaining the authors' permission (interested parties are requested to contact the corre-

sponding author). In line with the recommendations of its authors, the questionnaire was translated from Dutch to Polish, followed by a back-translation from Polish to Dutch, according to the principles of test adaptation. The available English version of the test allowed for additional verification of the final version of SFQ by a team of clinicians (physicians and clinical psychologist). Studies are ongoing to assess the reliability of the SFQ test in a group of Polish patients referred for orthopedic and cardiac surgery. A preliminary study conducted among 65 patients awaiting cardiac surgery provided promising results regarding the reliability of the scale (Cronbach's α coefficient for the full scale was 0.93, for short-term aspects of surgery was 0.91, and for long-term surgery aspects was 0.90). The SFQ questionnaire has been used in studies conducted in the Netherlands [28, 29], Greece [34], Portugal [35, 36], Turkey [21, 23, 33, 37–43], Croatia [44], Norway [45], Germany [31], Italy [46], Czech Republic [30], China [32], United States [47, 48], Ireland [49], and Hungary [50–52]. Most of these publications appeared in the years 2022–2023. We hope that the creation of the Polish version by the authors of this work will contribute to its wider use in our country. The scale is available for free but requires the authors' consent for its use in research or – in the case of a lack of a language version for a given country – for translation and adaptation [28, 29].

THE SURGICAL ANXIETY QUESTIONNAIRE

The Surgical Anxiety Questionnaire (SAQ) (Polish: *Kwestionariusz Lęku Chirurgicznego*) consists of 17 statements and was developed based on the analysis of an initial questionnaire containing 27 items [14]. Factor analysis allowed for the identification of 3 subscales: (I) health-related concerns – 6 items, (II) concerns about convalescence – 4 items, (III) concerns about the surgical procedure – 4 items. The scale also includes three additional items important from the perspective of anxiety intensity, concerning fear about waking up during surgery (1 item), concern about the time to return to daily activities (1 item), and concern about pain and discomfort (1 item). Patients are asked to indicate the degree to which they experience a given concern on a 5-point Likert scale ("not at all", "a little", "moderately", "very", "extremely"; item scoring from 0 to 4 points). The maximum score on the scale is 68 points, and a higher score indicates a higher intensity of anxiety. So far, this scale has been used in a few studies [14, 53], but the results regarding its reliability are promising, and an undeniable advantage is the inclusion of many possible patient concerns. However, this may also be a limitation due to the longer time required for older individuals, those with cognitive impairment, or in poorer somatic condition to complete the questionnaire. The scale seems particularly useful for creating detailed educational and psycho-educational interventions as part of prehabilitation. The authors also recommend determining cutoff point for the SAQ score indicating a clinically significant level of anxiety for each studied patient group [14]. To obtain the questionnaire, one should contact the authors of the paper describing the process of its development and validation [14].

ANESTHESIA- AND SURGERY-DEPENDENT PREOPERATIVE ANXIETY

The Anesthesia- and Surgery-dependent Preoperative Anxiety (ASPA) questionnaire contains eight items. It was created specifically for a study involving day-care surgery [54]. It evaluates the extent to which patients perceive anesthesia and surgery as life-threatening, in addition to concerns related to postoperative pain, complications during surgery and postoperative problems with cognitive functioning. Patients are asked to select the answer which best describes intensity of their fear on the Likert scale (1 – "never", 2 – "low", 3 – "moderate", 4 – "strong", 5 – "extreme"). The total score ranges from 1 to 40 points with higher scores reflecting higher intensity of anxiety [54].

SUMMARY AND DIRECTIONS FOR FUTURE RESEARCH

The aim of this study was to enrich the previously presented set of tools for assessing preoperative anxiety with methods that not only evaluate the intensity of anxiety but also involve the specific concerns of patients awaiting surgical procedures. It is important to remember that some fears may stem from insufficient information provided to patients, from unfavorable experiences of the patients themselves and their relatives with previous procedures, and from myths prevalent in society, which need to be verified and demystified to provide patients with reliable information that can reduce their anxiety.

The questionnaires presented in this work are important tools among the methods assessing preoperative anxiety, especially in the case of prehabilitation interventions, as understanding the fears and needs of patients can be a determinant for education and psychoeducation, especially for anesthesiologists, but also surgeons, nursing staff, primary care physicians, and clinical psychologists. The most appropriate seems to be the assessment of the intensity of anxiety, for example, using the Amsterdam Preoperative Anxiety and Information Scale (APAIS) or the anxiety subscale of the Hospital Anxiety and Depression Scale (HADS) [11], and additionally understanding individual fears and perspectives

of the person examined using one of the questionnaires presented above. They concern many aspects related to the procedure itself and anesthesia, fear of pain and death, and long-term concerns such as returning to full activity and physical fitness, the convalescence process, or rehabilitation. An important element of preparation for surgery is understanding individual needs and assessing satisfaction with the information received [34], especially since a high demand for information is associated with high intensity of preoperative anxiety [17, 55].

The fact that the presented tools are self-assessment scales is indeed their advantage, not a disadvantage. The patient could indicate, and the clinician understand, individual fears and feelings, about which the patients themselves are 'specialists' [11]. The use of self-assessment scales in this context ensures the acquisition of reliable data about the idiosyncratic needs and fears of patients, thereby increasing the likelihood of planning an effective intervention while maintaining the subjectivity of patients. It should be remembered that in the case of older people, assistance in completing the questionnaire should be available. The difficulty of completing it should not be a reason to refrain from assessing the anxiety and fears of our patients.

A review of the literature indicates several potential avenues for future research which are worth noting. Establishing cutoff points for anxiety-assessment scales is recommended to identify a threshold score indicative of clinically significant anxiety. This can be accomplished through statistical methods and by correlating with other standardized scales that measure anxiety intensity. Stratifying patients into high and low anxiety groups based on the median score of the population under study is also a viable approach. Further research employing the ASPA questionnaire is necessary, particularly to validate its reliability. Given that it was created for fast-track surgery [54], this interesting method also requires the evaluation of its usefulness in additional surgical disciplines. It is worth emphasizing the ASPA questionnaire's unique, valuable feature which is inclusion of items related to concerns about postoperative cognitive functioning. Given the high prevalence of postoperative delirium and prolonged cognitive decline, particularly among elderly patients [56], these concerns warrant attention and should be addressed during the preoperative period. According to our and other authors' experience, in particular postoperative delirium can be extremely stressful for both patients and their families. Therefore, providing information about the potential for its occurrence, characteristics, symptoms, and management strategies is crucial [56–59].

From a clinician's perspective and based on the experiences of the authors of this work, the individual intensity of a patient's anxiety and their specific fears seem more significant than the general score on a given scale, i.e. mean values for a given population. However, determining a cutoff point using statistical methods is important for identifying risk groups, thus indicating patients requiring special attention. Both types of analysis results seem useful and justified.

Another important direction for future research is the acquisition of additional language versions of the presented tools, especially of the SAQ and ASPA scales, which will increase the scope of research, enable cross-cultural and international comparisons, and take into account social and cultural conditions, including the aspect of spirituality. These seem to have particular significance for studying modifiable factors conditioning the sense of anxiety and stress before surgery [22, 60].

There is a range of publications on prehabilitation that provide evidence of its importance and vast multi-aspect usefulness, including interventions aimed at improving the mental state of patients. However, the results of current studies are not entirely consistent, due in part to diverse methodological approaches, the use of different measurement tools for the variables studied, and definitions of treatment outcomes. Therefore, further research is needed to assess the effectiveness of prehabilitation programs, with particular emphasis on longitudinal studies and aiming for some standardization of educational interventions while maintaining an individual approach to patients' fears and anxieties, as well as patient satisfaction assessment [1, 8, 9, 36].

Attention should be paid to the broad possibilities of using preoperative anxiety assessment scales in prehabilitation, anesthesiology, surgery, clinical psychology in surgery, nursing, and primary care. These methods are widely available (few have limitations) and, after brief training, can be used by all healthcare providers [11].

While recognizing the usefulness of psychometric methods, it is essential not to forget that effective communication and creating a good patient-doctor relationship, which increases trust and a sense of security, is the basis for effective work with patients experiencing fears before surgery.

This article, although covering a wide range of literature from recent years, does not exhaust the topic. The summary of patients' fears and concerns presented in Table 3, based on the literature and our own experience, is valuable, although it also seems insufficient [13, 17, 19, 54, 61–64]. It does, however, highlight the broad range of concerns of patients awaiting surgery.

TABLE 3. The list of concerns and fears of patients awaiting surgery*

General concerns
Fear of unknown
Fear for life, fear of death
Waiting for the procedure
Fear of procedure postponement
Fear of medical mistake
Concerns related to diagnosis and disease specifics, nature of the disease, illness perception
Concerns about the surgery itself, i.e. procedure, its complexity, duration, related risks
Concerns about anesthesia itself
Concerns related to hospitalization
Being away from loved ones, loneliness
Feelings of shame, embarrassment, lack of privacy
Dependency on staff, i.e. relying entirely on healthcare providers for basic needs and care
Loss of control: losing autonomy and control over decisions and own body
Feeling unsafe
Concerns related to operation theater, intensive care unit
Anxiety related to procedures, e.g., injections, IV insertion, tracheal extubation
General atmosphere in a ward, i.e.: difficulties related to communication with medical staff, lack of empathy and understanding, lack of support
Intraoperative concerns
Fear of intraoperative complications
Waking up during surgery
Pain during surgery
Possibility of blood transfusion
Concerns related to postoperative period
Postoperative complications
Not waking up after surgery
Nausea, vomiting, other discomforts after waking up
Need for intensive care
Postoperative pain
Postoperative delirium, prolonged problems with cognitive functioning
Possibility of infection
Wound healing process, prolonged wound healing, specific care of the wound
Surgery outcomes, unmet expectations regarding the results
Concerns about appearance, visible scar, presence, and extent of scarring
Fear of permanent health deterioration, disability, inability to return to full fitness, sexual dysfunction
Prolonged rehabilitation
Inability to return to work, prolonged absence from work
Financial strain, economic deterioration
Concerns about family, inability to care for children or other family members

*Based on authors' own experience and literature, especially refs.: 13, 17, 19, 54, 61–64.

Given the possibility that the summary may not fully capture the multitude of concerns experienced by individuals awaiting surgical procedures, and considering the diversity inherent in different surgical specialties, it is essential to undertake a systematic review of both quantitative and qualitative research pertaining to these concerns and the factors influencing the intensity of anxiety. Additionally, conducting further qualitative research is vital to enrich our understanding of the individual perspectives of patients, enabling better comprehension and the planning of the most effective interventions [65]. The value of the SAQ lies, among other merits, in the fact that it was created based on themes that emerged from qualitative research [14]. The necessity of using a qualitative approach to enhance understanding of the unique experience of patients, including those awaiting surgery, is emphasized [14, 66–68].

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REFERENCES

1. Banasiewicz T, Kobiela J, Cwaliński J, et al. Rekomendacje w zakresie stosowania prehabilitacji, czyli kompleksowego przygotowania pacjenta do zabiegu operacyjnego. Pol Przegl Chir 2023; 95: 61-91. doi: 10.5604/01.3001.0053. 8854.
2. Kassahum WT, Mehdorn M, Wagner TC, et al. The effect of preoperative patient-reported anxiety on morbidity and mortality outcomes in patients undergoing major general surgery. Sci Rep 2022; 12: 6312. doi: https://doi.org/10.1038/s41598-022-10302-z.
3. Jeske P, Wojtera B, Banasiewicz T. Prehabilitacja – obecna rola w chirurgii. Pol Przegl Chir 2022; 94: 64-72. doi: 10.5604/01.3001.0015.7340.
4. Koc MA, Akyol C, Gokmen D, et al. Effect of prehabilitation on stoma self-care, anxiety, depression, and quality of life in patients with stomas: a randomized controlled trial. Dis Colon Rectum 2023; 66: 138-147. doi: 10.1097/DCR.0000000000002275.
5. Kwok KM, Tay SS. Outcomes of a multi-modal hospital-associated home-based cancer prehabilitation program. Ann Rehabil Med 2023; 47: 52-67. doi: https://doi.org/10.5535/arm.22126.
6. Le Roy B, Selvy M, Slim K. The concept of prehabilitation: what the surgeon needs to know? J Visc Surg 2016; 153: 109-112. doi: https://doi.org/10.1016/j.jviscsurg.2016.01.001.
7. Levett D Z H, Grimmett C. Psychological factors, prehabilitation and surgical outcomes: evidence and future directions. Anaesthesia 2019; 74 (Suppl 1): 36-42. doi: 10.1111/anae.14507.
8. Tsimopoulou I, Pasquali S, Howard R, et al. Psychological prehabilitation before cancer surgery: a systematic review. Ann Surg Oncol 2015; 22: 4117-4123. doi: 10.1245/s10434-015-4550-z.
9. Taha A, Taha-Mehlitz S, Staartjes VE, et al. Association of a prehabilitation program with anxiety and depression before colorectal surgery: a post hoc analysis of the pERACS randomized controlled trial. Langenbeck's Arch Surg 2021; 406: 1553-1561. doi: https://doi.org/10.1007/s00423-021-02158-0.
10. Arora RC, Brown CH 4th, Sanjanwala RM, McKelvie R. "NEW" Prehabilitation: a 3-way approach to improve postoperative survival and health-related quality of life in cardiac surgery patients. Can J Cardiol 2018; 34: 839-849. doi: 10.1016/j.cjca.2018.03.020.
11. Zemła A, Nowicka-Sauer K, Jarmoszewicz K, et al. Measures of preoperative anxiety. Anaesthesiol Intensive Ther 2019; 51: 64-69. doi: 10.5603/AIT.2019.0013.
12. Sobczak K, Leoniuk K. Doctor's attitude in the situation of delivering bad news: patients' experience and expectations. Arch Med Sci 2023; 19: 921-929. doi: https://doi.org/10.5114/aoms/112756.
13. Abate SM, Chekol YA, Basu B. Global prevalence, and determinants of preoperative anxiety among surgical patients: a systematic review and meta-analysis. Int J Surg Open 2020; 25: 6-16. doi: https://doi.org/10.1016/j.ijso.2020.05.010.
14. Burton D, King A, Bartley J, Petrie KJ, Broadbent E. The surgical anxiety questionnaire (SAQ): development and validation. Psychol Health 2019; 34: 129-146. doi: 10.1080/08870446.2018.1502770.
15. Gezer D, Arslan S. The effect of education on the anxiety level of patients before thyroidectomy. J Perianesth Nurs 2019; 34: 265-271. doi: https://doi.org/10.1016/j.jopan.2018.05.017.
16. Shaughness G, Howard R, Englesbe M. Patient-centered surgical prehabilitation. Am J Surg 2018; 216: 636-638. doi: http://dx.doi.org/10.1016/j.amjsurg.2017.04.005.

17. Jarmoszewicz K, Nowicka-Sauer K, Zemła A, Beta S. Factors associated with high preoperative anxiety: Results from cluster analysis. World J Surg 2020; 44: 2162-2169. doi: https://doi.org/10.1007/s00268-020-05453-x.
18. Karanci AN, Dirik G. Predictors of pre- and postoperative anxiety in emergency surgery patients. J Psychosom Res 2003; 55: 363-369. doi: 10.1016/S0022-3999(02)00631-1.
19. Gürler H, Yilmaz M, Turk KE. Preoperative anxiety levels in surgical patients: a comparison of three different scale scores. J Perianesth Nurs 2022; 37: 69-74. doi: https://doi.org/10.1016/j.jopan.2021.05.013.
20. Ugras GA, Kanat C, Yaman Z, Yilmaz M, Turkmenoglu MO. The effects of virtual reality on preoperative anxiety in patients undergoing colorectal and abdominal wall surgery: A randomized controlled trial. J Perianesth Nurs 2023; 38: 277-283. doi: 10.1016/j.jopan.2022.07.005.
21. Soydaş Yeşilyurt D, Yildiz Findik Ü. Effect of Preoperative video information on anxiety and satisfaction in patients undergoing abdominal surgery. Comput Inform Nurs 2019; 37: 430-436. doi: 10.1097/CIN.0000000000000505.
22. Muslu U, Demir E. Investigation of the relationship between anxiety levels of patients before plastic surgery operation and worship practices in Muslims. J Religion Health 2020; 59: 535-543. doi: https://doi.org/10.1007/s10943-019-00846-2.
23. Menevşe S, Yayla A. Effect of emotional freedom technique applied to patients before laparoscopic cholecystectomy on surgical fear and anxiety: a randomized controlled trial. J Perianesth Nurs 2024; 39: 93-100. DOI: 10.1016/j.jopan.2023.07.006.
24. Kankaya EA, Bilik O. Three enemies of circadian rhythm: anxiety, sleeplessness and pain in patients following open-heart surgery. Clin Exp Health Sci 2019; 9: 246-252. doi: 10.33808/clinexphealthsci.599805.
25. Yayla A, Ilgin VE, Kilinc T, Ozlu ZK, Apay SE. Nausea and vomiting after laparoscopic cholecystectomy: Analysis of predictive factors. J Perianesth Nurs 2022; 37: 834-841. doi: https://doi.org/10.1016/j.jopan.2022.01.002.
26. Aliche JCh, Ifeagwazi ChM, Eze JE. Emotional reactivity and surgical anxiety. The protective nature of perceived social support. Psychol Health Med 2020; 25: 434-445. DOI: 10.1080/13548506.2019.1668030.
27. Simsek Yaban Z, Bulbuloglu S, Kapikiran G. The effect of bed exercises following major abdominal surgery on early ambulation, mobilization, pain, and anxiety: a randomized-controlled trial. Int Wound J 2023; 21: e14406. doi: 10.1111/iwj.14406.
28. Theunissen M, Peters ML, Schouten EGW, et al. Validation of the Surgical Fear Questionnaire in adult patients waiting for elective surgery. PLoS One 2014; 9: e100225. doi: 10.1371/journal.pone.0100225.
29. Theunissen M, Jonker S, Schepers J, et al. Validity and time course of surgical fear as measured with the Surgical Fear Questionnaire in patients undergoing cataract surgery. PLoS One 2018; 13: e0201511. doi: https://doi.org/10.1371/journal. pone.0201511.
30. Zelenikova R, Kovarova K, Bujok P, Theunissen M. The Czech version of the Surgical Fear Questionnaire: measuring validity and reliability. Eur J Nurs Midw 2022; 13: 571-578. doi: 10.15452/CEJNM.2021.12.0022.
31. Riecke J, Zerth SF, Schubert AK, et al. Risk factors and protective factors of acute postoperative pain: an observational study at a German university hospital with cross-sectional and longitudinal inpatient data. BMJ Open 2023; 13: e069977. doi: http://dx.doi.org/10.1136/bmjopen-2022-069977.
32. Yang G, Zang X, Ma X, Bai P. Translation, cross-cultural adaptation, and psychometric properties of the Chinese version of the Surgical Fear Questionnaire. J Perianesth Nurs 2022; 37: 386-392. doi: https://doi.org/10.1016/j.jopan.2021.08.004.
33. Bagdigen M, Ozlu ZK. Validation of the Turkish version of the Surgical Fear Questionnaire. J Perianesth Nurs 2018; 33: 708-714. doi: http://dx.doi.org/10.1016/j.jopan.2017.05.007.
34. Malliarou M, Pappa V, Papathanasiou I, et al. The effect of an information brochure on patients undergoing cardiac catheterization on their anxiety, knowledge, and fear: a randomized controlled study. Health Psychol Res 2022; 10: 35640. doi: https://doi.org/10.52965/001c.35640.
35. Pinto PR, McIntyre T, Fonseca C, Almeida A, Araújo-Soares V. Pre- and post-surgical factors that predict the provision of rescue analgesia following hysterectomy. Eur J Pain 2013; 17: 423-433. doi: 10.1002/j.1532-2149.2012.00205.x.
36. Dahlem C, Monteiro C, Mendes E, et al. Modulating influence of state anxiety on the effect of midazolam on postsurgical pain. J Clin Med 2023; 12: 2669. doi: https://doi.org/10.3390/jcm12072669.
37. Akutay S, Ceyhan O. The relationship between fear of surgery and affecting factors in surgical patients. Perioper Med 2023; 12: 22. doi: https://doi.org/10.1186/s13741-023-00316-0.
38. Işıklı AG, Özkan ZK, Buberka Z. The fear of surgery and coronavirus in patients who will undergo a surgical intervention. J Perianesth Nurs 2023; 38: 134-138. doi: 10.1016/j.jopan.2022.06.015.
39. Sisman H, Arslan S. The effect of reiki on anxiety, fear, pain, and oxygen saturation in abdominal surgery patients: a randomized controlled trial. Explore 2023; 19: 578-586. doi: https://doi.org/10.1016/j.explore.2022.11.005.
40. Taylan S, Çelik GK. The effect of preoperative fear and related factors on patients' postcataract surgery comfort level: a regression study. J Perianesth Nurs 2022; 37: 398-403. doi: 10.1016/j.jopan.2021.08.014.
41. Surme Y, Cimen O. Preoperative surgical fear and related factors of patients undergoing brain tumor surgery. J Perianesth Nurs 2022; 37: 934-938. doi: https://doi.org/10.1016/j.jopan.2022.04.006.
42. Karabulut N, Gurcayir D, Abi O, Aggul BK, Soylemez N. Does surgery cause anxiety, stress and fear in geriatric patients? Psychogeriatrics 2023; 23: 808-814. doi: 10.1111/psyg.13000.
43. Kapikiran G, Bulbuloglu S. The effect of perceived social support on psychological resilience and surgical fear in surgical oncology patients. Psychol Health Med 2024; 29: 473-483. doi: 10.1080/13548506.2022.2159458.
44. Karacic A, Brkic J, Theunissen M, et al. Are religious patients less afraid of surgery? A cross-sectional study on the relationship between dimensions of religiousness and surgical fear. PLoS One 2023; 18: e0287451. doi: https://doi.org/10.1371/journal. pone.0287451.
45. Engel S, Jacobsen HB, Reme SE. A cross-sectional study of fear of surgery in female breast cancer patients: prevalence, severity, and sources, as well as relevant differences among patients experiencing high, moderate, and low fear of surgery. PLoS One 2023; 18: e0287641. doi: https://doi.org/10.1371/journal.pone.0287641.
46. Candela L, Ventimiglia E, Corrales M, et al. The use of a virtual reality device (HypnoVR) during extracorporeal shockwave lithotripsy for treatment of urinary stones: Initial results of a clinical protocol. Urology 2023; 175: 13-17. doi: https://doi.org/10.1016/j.urology.2023.01.048.
47. Lai E, Grimes CL, Kasoff M, et al. Assessment of level of fear in adult patients undergoing elective urogynecologic and gynecologic procedures and surgeries during the COVID-19 pandemic using the validated Surgical Fear Questionnaire. Female Pelvic Med Reconstr Surg 2022; 28: e88-e92. doi: 10.1097/SPV.0000000000001162.
48. Ramirez DA, Brodie FL, Rose-Nussbaumer J, Ramanathan S. Anxiety in patients undergoing cataract surgery: a pre- and postoperative comparison. Clin Ophthalmol 2017; 11: 1979-1986. doi: http://dx.doi.org/10.2147/OPTH.S146135.
49. Loughney L, McCaffrey N, Timon CM, et al. Physical, psychological, and nutritional outcomes in a cohort of Irish patients with metastatic peritoneal malignancy scheduled for cytoreductive surgery (CRS) and heated intrapertioneal chemotherapy (HIPEC): an exploratory pilot study. PLoS One 2020; 15: e0242816. doi: https://doi.org/10.1371/journal.pone.0242816.
50. Wittmann V, Csabai M, Drótos G, et al. The reliability and validity of the Hungarian version of the Surgical Fear Questionnaire. Orv Hetil 2018; 159: 1988-1993. doi: 10.1556/650.2018.31205.
51. Wittmann V, Latos M, Horvath Z. Complex supportive care of patients with breast cancer. The preliminary results of a psychological intervention study. Orv Hetil 2019; 160: 700-709. doi: 10.1556/650.2019.31367.
52. Szilagyine Lakatos T, Lukacs B, Nagy AC, Jenei Z, Veres-Balajti I. Efficiency of printed patient information leaflets written for total knee and hip arthroplasty patients to reduce their fear of surgery. Geriatrics 2023; 8: 89. doi: https://doi.org/10.3390/geriatrics8050089.
53. Mohsenpour M, Ebadi A, Mousavi B, Repišti S, Sharif Nia H, Ghanei Gheshlagh R. Psychometric evaluation of the Farsi version of the Surgical Anxiety Questionnaire. J Perianesth Nurs 2023; 2: S1089-9472(23)00121-1. doi: 10.1016/j.jopan.2023.03.003.
54. Wetsch WA, Pircher I, Lederer W, et al. Preoperative stress and anxiety in day-care patients and inpatients undergoing fast-track surgery. Br J Anaesthesia 2009; 103: 199-205. doi: 10.1093/bja/aep136.
55. Moerman N, van Dam FSAM, Muller MJ, Oosting H. The Amsterdam Preoperative Anxiety and Information Scale (APAIS). Anesth Analg 1996; 82: 445-451.
56. Kang T, Park SY, Lee JH, et al. Incidence and risk factors of postoperative delirium after spinal surgery in older patients. Sci Rep 2020; 10: 9232. doi: https://doi.org/10.1038/s41598-020-66276-3.
57. McDaniel M, Brudney Ch. Postoperative delirium: etiology and management. Curr Opin Crit Care 2012; 18: 372-376. doi: 10.1097/MCC.0b013e3283557211.

58. Cunningham J, Kim LD. Post-operative delirium: a review of diagnosis and treatment strategies. J Xiangya Med 2018; 3: 8. doi: http://dx.doi.org/10.21037/jxym.2018.01.03.
59. Welsch E, Vashisht A, Stutzman SE, Olson DWM. Family presence may reduce postoperative delirium after spinal surgery. J Neurosci Nurs 2023; 55: 97-102. doi: https://doi.org/10.1097/JNN.0000000000000704.
60. Ai AL, Park CL, Huang B, Rodgers W, Tice TN. Psychosocial mediation of religious coping styles: a study of short-term psychological distress following cardiac surgery. Pers Soc Psychol Bull 2007; 33: 867-882. doi: 10.1177/0146167207301008.
61. Napora J, Gryglewski K, Piotrowicz M, Nowicka-Sauer K, Mazurek T. Analysis of concerns among patients operated for carpal tunnel syndrome. Chir Narzadow Ruchu Ortop Pol 2021; 86: 115-121. doi: 10.31139/chnriop.2021.86.4.4.
62. Koivula M, Tarkkaa MT, Tarkkab M, Laippalac P, Paunonen-Ilmonena M. Fear and anxiety in patients at different time-points in the coronary artery bypass process. Int J Nurs Stud 2002; 39: 811-822. doi: https://doi.org/10.1016/S0020-7489(02)00022-6.
63. Akinsulore A, Owojuyigbe AM, Faponle AF, Fatoye FO. Assessment of preoperative and postoperative anxiety among elective major surgery patients in a tertiary hospital in Nigeria. Middle East J Anaesthesiol 2015; 23: 235-240.
64. Hernandez-Palazon J, Fuentes-García D, Falcon-Arana L, et al. Assessment of preoperative anxiety in cardiac surgery patients lacking a history of anxiety: contributing factors and postoperative morbidity. Cardiothorac Vasc Anesth 2018; 32: 236-244. doi: 10.1053/j.jvca.2017.04.044.
65. Rudnik A, Bieńkowski J. Interpretacyjna analiza fenomenologiczna w badaniach jakościowych w psychologii. Przegląd najnowszych badań. Stud Psychol 2018; 11: 27-38. doi: 10.24917/20845596.11.2.
66. King A, Bartley J, Johanson DL, Broadbent E. Components of preoperative anxiety: a qualitative study. J Health Psychol 2019; 24: 1897-1908. doi: 10.1177/1359105317709512.
67. Carr T, Teucher U, Mann J, Casson AG. Waiting for surgery from the patient perspective. Psychol Res Behav Manag 2009; 2: 107-119. doi: 10.2147/prbm.s7652.
68. Fitzsimons D, Parahoo K, Richardson SG, Stringer M. Patient anxiety while on a waiting list for coronary artery bypass surgery: a qualitative and quantitative analysis. Heart Lung 2003; 32: 23-31. doi: 10.1067/mhl.2003.3.