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## The influence of selected factors on the level of stress among patients qualified for the operation

### Abstract

**Introduction.** The surgery and its circumstances are difficult situation for patient and his/her relatives. Patient is afraid of operation, its consequences, hospitalization regardless of the type of surgery and course of anaesthesia. Obtaining reliable information by patient from the staff helps to understand the desirability of procedure and principles for preoperative preparation.

**Aim.** The assessment of the influence selected factors on the level of stress perceived by patients qualified for the anaesthesia before the operation.

**Material and methods.** A survey performed amongst 100 adult patients (women and men), qualified for anaesthesia prior to surgery in Independent Public Clinical Hospital No. 4 in Lublin (SPSK-4). Research tools – an authorial questionnaire composed of 19 questions and the scale of perceived stress PSS-10.

**Discussion.** Research has shown that level of stress before anaesthesia and surgery was significantly higher in group of women than men. Furthermore, respondents who work occupationally more frequently had high and very high level of stress compared to the surveyed with pension, retirement or unemployed. Age, place of living, education, marital status, material status, presence of intercurrent illness, type of operation/anaesthesia as well as number of procedures found no relationship regarding the level of perceived stress.

**Conclusion.** 1. The level of stress before anaesthesia for surgery is high. 2. Gender and professional activity affect the level of experienced stress. 3. The patient's mental preparation may have an influence on perioperative stress reduction.

**Keywords:** surgery, anaesthesia, preoperative stress.

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### INTRODUCTION

Disease and necessity of performing an operation constitute difficult situation, frequently unexpected, causing fear, anxiety. Hospitalisation involves the need to comply with rules on the ward, privacy limitations, dysfunction of performing social roles as well as temporary separation from the home and professional environment. Waiting for anaesthesia and surgery creates a lot of emotional excitement [1,2].

Stress suffered by patient can be associated with his/her personality, age, gender, previous experience, types of anaesthesia and the extent of surgery. Medical staff plays an important role in process of mental support. Incredibly important element of preparing patient is conversation and detailed explanation of any issues of interest to him. Respect for the right relationship with the patient, explaining nature of surgery and examinations can reduce fear and dread. Proper care undoubtedly contributes to keeping patient comfort and to patient's treatment being less severe and lighter. Charity, openness, friendliness and listening skills are necessary to help the patient in agreement with this situation and in the recovery of the biopsychosocial balance [3-6].

### AIM

The assessment of the influence selected factors on the level of stress perceived by patients qualified for the anaesthesia before the operation.

### MATERIAL AND METHODS

The study included a group of 100 patients waiting for surgery at age from 19 to 81 years. The average age of participants was  $55.92 \pm 17.71$  years. Men constituted 53.00% (n=53), while women – 47.00% (n=47) (Fig. 1).

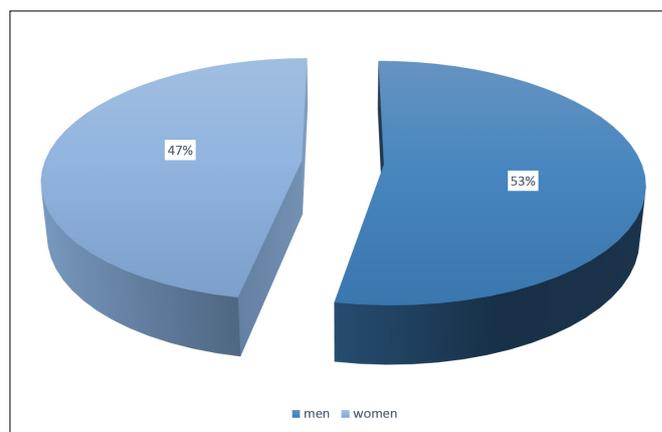


FIGURE 1. Distribution of respondents by gender.

Source: Own work

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Among the respondents, 26.00% (n=26) were in the age group under 45, while 34.00% (n=34) were aged from 46 to 65 years and 40.00% (n=40) were aged over 65 years (Fig. 2).

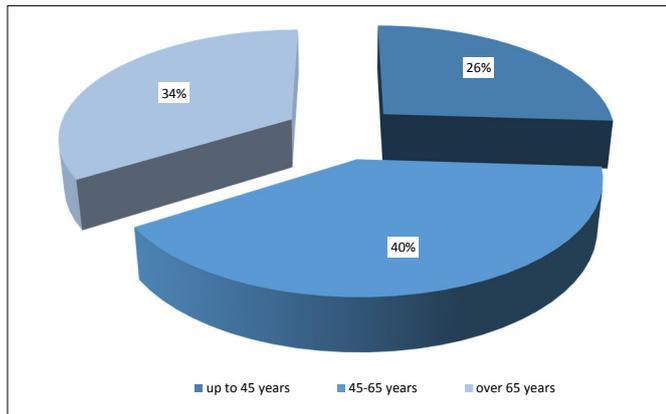


FIGURE 2. Distribution of respondents by age.

Source: Own work

When it comes to 34.00% (n=34) of the respondents, they lived in the village, 6.00% (n=6) in a commune village, 37.00% (n=37) in a city and 23.00% (n=23) in a regional capital (Fig. 3).

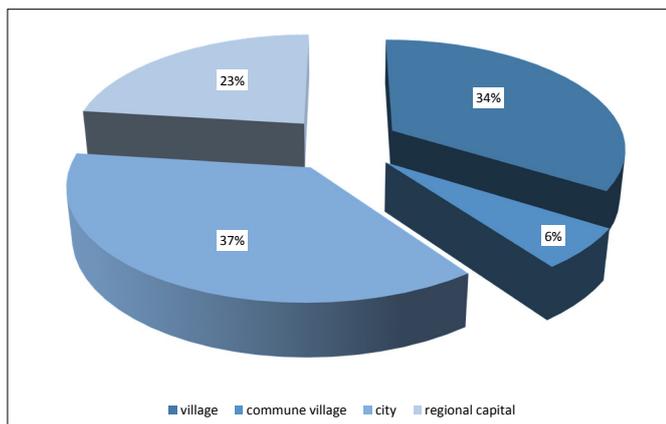


FIGURE 3. Distribution of respondents by residence.

Source: Own work

The respondents the most commonly had higher education (31.00%, n=31) or secondary vocational education (25.00%, n=25), 5.00% (n=5) of the respondents had primary education, 2.00% (n=2) lower secondary education, 16.00% (n=16) basic vocational education, 12.00% (n=12) general secondary education and 9.00% (n=9) post-secondary education (Fig. 4).

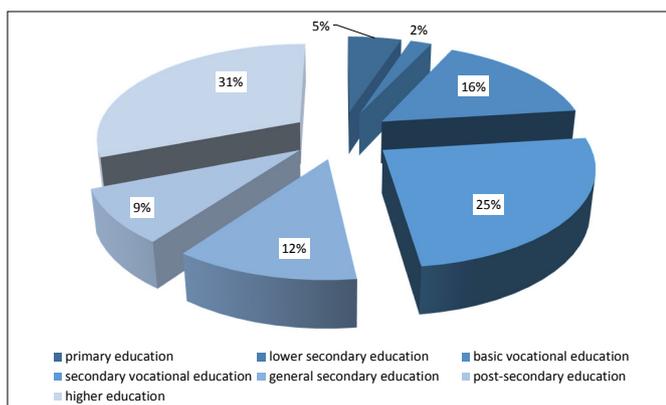


FIGURE 4. Distribution of respondents by education.

Source: Own work

The respondents were most often married (70.00%, n=70), 13.00% (n=13) of the respondents were single, 13.00% (n=13) of them were widows and widowers and 4.00% (n=4) were divorced (Fig. 5).

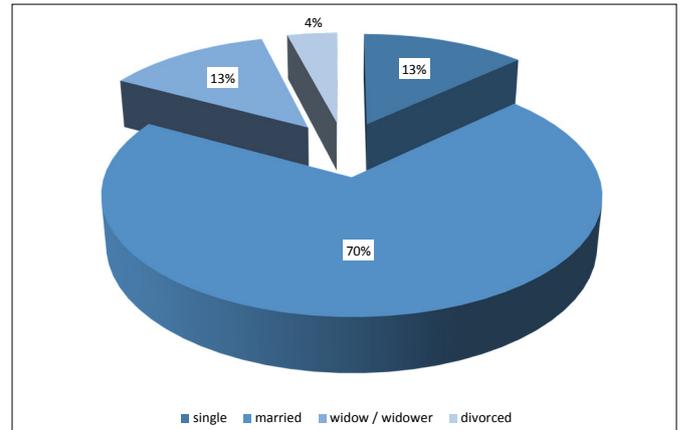


FIGURE 5. Distribution of respondents by marital status.

Source: Own work

The respondents in 42.00% (n=42) were working professionally, 6.00% (n=6) of the respondents were not working, 44.00% (n= 44) were retired and 8.00% (n=8) were on a pension (Fig. 6).

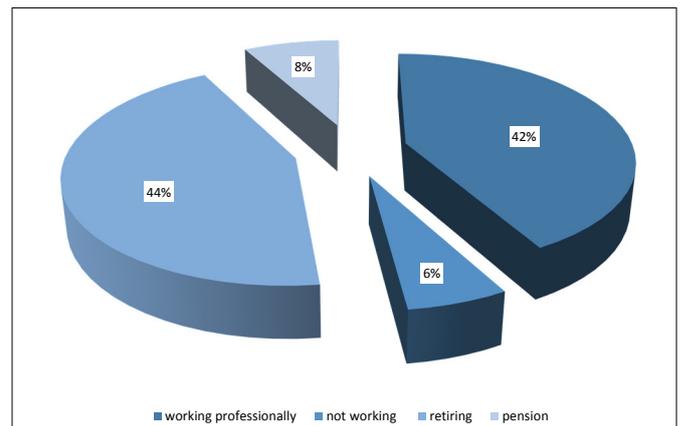


FIGURE 6. Distribution of respondents by professional activity.

Source: Own work

The majority of the respondents had good material status (42%, n=42), 39.00% (n=39) of respondents had satisfactory material status, 9.00% (n=9) had very good material status, 8.00% (n=8) had low and 2.00% (n=2) very low material status (Fig. 7).

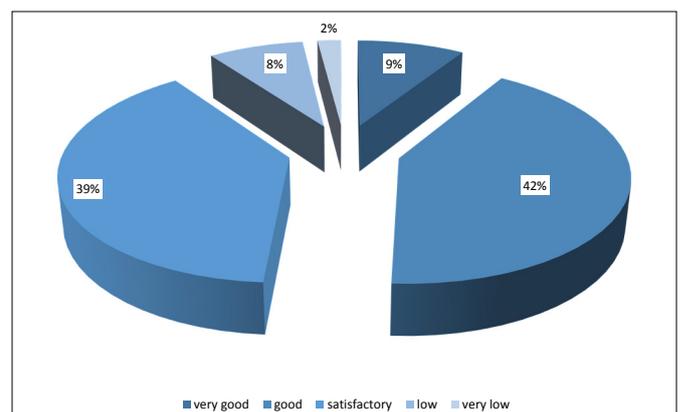


FIGURE 7. Distribution of respondents by material situation.

Source: Own work

Diagnostic survey method allows for public opinion surveys and makes it possible to establish the opinion of a large population, selected as a representative group (so-called population sample). It is one of the most popular research methods [7].

We have created our own questionnaire to conduct the survey. It contains instructions for the respondents and 19 questions. However, the Perceived Stress Scale PSS-10 is used to measure subjective feelings related to personal problems, events and ways of coping with them. It is intended to assess the intensity of stress resulting from one's own life situation over the last month. The scale is mainly devoted to research purposes, but it is also used in screening and preventive tests [8].

The PSS-10 scale is one of the "paper-and-pencil" methods. This means that it is a self-report tool. There is a space on the answer sheet for entering personal data, but most often it is left blank so that the survey can remain anonymous. It is important to make sure that the test taker is able to read the questions on his own and understands their content. It contains 10 questions related to ability to control irritability, nervousness or anger, as well as overcome emerging difficulties and deal with stress. The respondent enters the appropriate number for each question, namely: 0 – which means never, 1 – almost never, 2 – sometimes, 3 – quite often or 4 – very often. The time spent on completing the scale is usually about 5 minutes [8].

Research results obtained were statistically analyzed. The values of the measured parameters analyzed are shown by means of a mean value, the median value and standard deviation, while non-measurable parameters are shown by cardinality and percentage. For measurable features, the normal distribution of the analyzed parameters was assessed using W Shapiro-Wilk test.

To compare two independent groups, Mann Whitney's test was used. The Kruskal-Wallis test was used to compare the age of the groups. For unrelated quality features, to detect the existence of differences between the compared groups Chi<sup>2</sup> test was used.

The level of significance was assumed  $p < 0.05$  indicating the existence of statistically significant differences or dependencies. The database and statistical surveys have been carried out on the basis of STATITICA 13.0 computer software (StatSoft, Poland).

## RESULTS

The research in the group of patients shows that most often stress level before anesthesia and surgery was high (43.00%), the sten values were within the range 7-10, while 39.00% of the studied patients had an average level of stress (5-6 sten) and 18.00% – low (1-4 sten), (Fig.8).

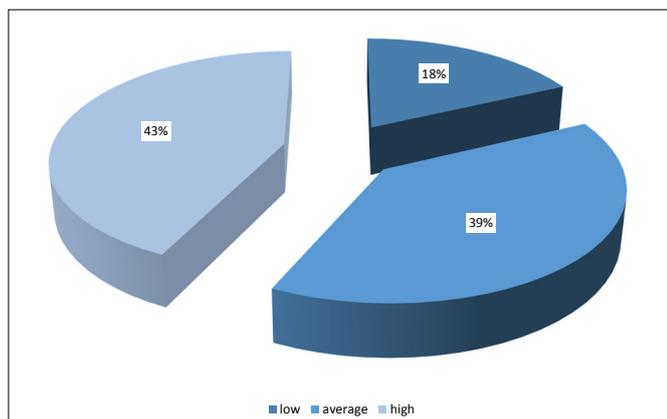


FIGURE 8. Distribution of respondents by the level of stress felt.

Source: Own work

The PSS-10 questionnaire was used to assess the level of stress. The score range was from 0 to 40. The higher the rating, the higher the level of perceived stress. The obtained raw results converted into sten norms showed that the values ranged most often in the range of 8 (21.00%) and 5 (20.00%) and 6 (19.00%) (Table 1). The average stress level was  $18.21 \pm 5.71$  (Me=18.50; range from 3 to 30).

TABLE 1. Stress level converted to sten standards.

Sten	N	%
1	0	0.00
2	1	1.00
3	7	7.00
4	10	10.00
5	20	20.00
6	19	19.00
7	16	16.00
8	21	21.00
9	6	6.00
10	0	0.00
Total	100	100.00

Source: Own work

Studies have shown that the level of stress before anesthesia and surgery was significantly higher in the group of women than in men. The differences found were statistically significant ( $p=0.04$ ), (Tab. 2; Fig. 9).

TABLE 2. Assessment of the stress level (PSS-10) taking into account gender.

Gender	Mean	Standard deviation	Lower quartile	Median	Upper quartile
Men	17.00	6.08	13.00	17.00	21.00
Women	19.57	4.98	16.00	20.00	24.00

Statistical analysis:  $Z=-2.05$ ;  $p=0.04^*$

Source: Own work

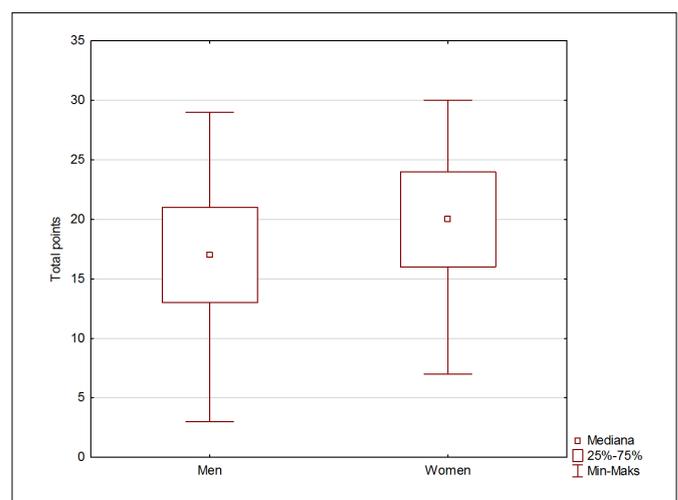


FIGURE 9. The level of stress in the group of women and men.

Source: Own work

Statistical analysis showed that respondents working professionally more often experienced high or very high levels of stress (33.33%) compared to respondents who were on a pension, retired or not working (12.07%). The differences found were statistically significant ( $p=0.03$ ) (Tab.3).

**TABLE 3. Self-assessment of the level of stress taking into account professional activity.**

Professional activity	Stress level			Total
	None/low	Moderate	High/very high	
	N %	N %	N %	
Working professionally	10 23.81%	18 42.86%	14 33.33%	42 100.00%
Retiring/pension/ not working	20 34.48%	31 53.45%	7 12.07%	58 100.00%
Total	30 30.00%	49 49.00%	21 21.00%	100 100.00%

Statistical analysis:  $\chi^2=6.73$ ;  $p=0.03^*$

Source: Own work

The conducted research showed that the respondents who expected epidural or subspider anesthesia more often experienced high or very high stress (33.33%) than respondents who expected general anesthesia (22.04%) or did not know what type of anesthesia it would be (8.70%). The found differences were close to statistical significance ( $p=0.06$ ) (Tab. 4).

**TABLE 4. Self-assessment of the level of stress taking into account the type of anesthesia.**

Types of anaesthesia	Stress level			Total
	None/low	Moderate	High/very high	
	N %	N %	N %	
General	15 25.42%	31 52.54%	13 22.04%	59 100.00%
Other <sup>1</sup>	3 16.67%	9 50.00%	6 33.33%	18 100.00%
I don't know	12 52.17%	9 39.13%	2 8.70%	23 100.00%
Total	30 30.00%	49 49.00%	21 21.00%	100 100.00%

Statistical analysis:  $\chi^2=8.85$ ;  $p=0.06$

<sup>1</sup>Other – subspider, epidural

Source: Own work

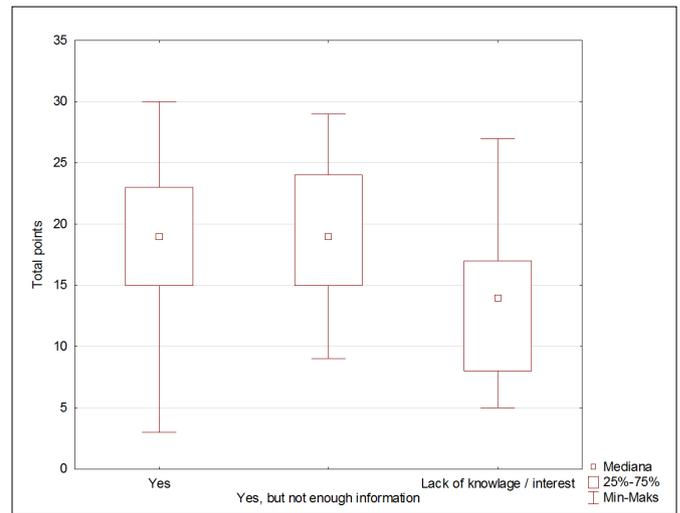
The research showed that respondents who had knowledge about anesthesia or had incomplete knowledge in their opinion felt higher level of stress than those who had no knowledge or were not interested in it. The differences shown were at the border of statistical significance ( $p = 0.05$ ) (Tab. 5; Fig. 10).

**TABLE 5. Assessment of the level of stress (PSS-10) taking into account knowledge of anesthesia.**

Knowledge of anesthesia	Mean	Standard deviation	Lower quartile	Median	Upper quartile
Yes	18.65	5.49	15.00	19.00	23.00
Yes, but not enough information	19.00	5.48	15.00	19.00	24.00
Lack of knowledge/ interest	14.09	6.28	8.00	14.00	17.00

Statistical analysis:  $H=5.83$ ;  $p=0.05$

Source: Own work



**FIGURE 9. The level of stress in the group of women and men.**

Source: Own work

## DISCUSSION

The results of my research show a high level of stress in 43% of respondents, average in 39%, and low in 18%. High levels of stress also prevailed in the studies by Starczewska et al. (50.81% of patients) and Śniecikowska (49% of respondents). The average level of anxiety in patients was demonstrated by the studies of Sobieralska-Michalak et al., as well as Augustyniuk et al. (44% of patients). A significant level of perceived stress may result from the patient's concerns about the course of anesthesia and surgical intervention, which often constitute an unknown and new situation for the patient [9-11].

The statistical analysis showed that age did not affect the level of perceived stress, however, in the study by Starczewska et al., statistical significance was shown between age and the level of stress intensity. Rusiecka and Panasiuk also emphasize the influence of age, especially younger ones, such as Augustyniuk et al., who indicate that younger people felt less anxious. On the other hand, Sioma-Markowska et al. and Derewianka-Polak et al. emphasize that with age the level of perceived stress increases. Different studies and different results. Perhaps this is due to the personality of the patients. Some are more mature, others are sensitive or more emotional, sometimes it results from life experiences [9,12-14].

The studies of Augustyniuk et al. report that education has an impact on the level of perceived stress, but the research I have carried out and the studies by Jałowicki et al. do not confirm this. It can be assumed that the discrepancy in the results, as in the case of age, arises from the characteristics that require a deeper analysis, and perhaps the number and characteristics of the research group are also important [9,15].

Research by Lewicka et al. has shown that the category of the type of surgery does not determine the level of anxiety, which also results from my research. Perhaps this is caused by the fact that each operation, no matter how extensive, is itself a stress factor [16].

The level of stress experienced before the procedure is higher in women, which is confirmed not only by the results of my research, but also by Bączyk et al., Romanik et al., Augustyniuk et al. and Starczewska et al. These results are surprising and we still do not know the exact answer why it is like that. Perhaps women are more sensitive and open than men

who communicate less about their feelings and that is why we obtain such results [9,17,18].

There are just a few publications about the relation of spinal and epidural anesthesia and stress. Leo and Booij noticed less emotional response in patients undergoing this method of analgesia, however, in my study, these anesthesia caused a greater level of stress in patients, which was close to statistical significance. Perhaps the puncture performed in the area of the spine makes patients fear of serious complications [19].

Usually in the literature we encounter the statement that the greater patient knowledge, the lower his stress. The research I have carried out shows that a large amount of information or a lack thereof in the patient's perception of analgesia causes a higher level of stress in the anesthetized person, in contrast to people who were not interested in this topic. The result was close to statistical significance. On the other hand, Sioma-Markowska et al. in the conducted research showed a correlation between the level of information demand and the level of anxiety. This means that the higher the level of anxiety, the greater the need for information on anesthesia and the course of surgery. The differences in research are difficult to explain. Perhaps it results from the individual characteristics of patients [14].

## CONCLUSIONS

1. The level of stress experienced before anesthesia for surgery is high.
2. Gender and professional activity influence the level of perceived stress.
3. The patient's mental preparation may contribute to the reduction of perioperative stress.

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