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Assessment of mental workload of nurses anesthesia - preliminary study

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Summary

Admission: Working nurse anesthesia is associated with exposure to harmful factors, ie. The ergonomic, psychosocial, physical, chemical and biological. This aspect is important because of the workload of nurses, their health and patient safety, quality of care and the related adverse events, errors, accidents at work.

Aim: The aim of the study was to analyze psychological burden anesthetic nurses.

Material and methods: The study was attended by 54 nurses anesthesia.

Conclusions: The study was conducted using a diagnostic survey using Questionnaire assessment of the burden of mental and author socio-demographic survey.

The survey results confirm that pAnesthetic ielęgniarki working in the Intensive Care is characterized by large load information, a large load monotony and large psychological burden.

Keywords: Nurse Anesthesia, workload, psychological stress

Admission

Anesthesiology and Intensive Therapy is a unique department of medicine, as are special departments of Anesthesiology and Intensive Care. Anesthesiology is responsible for preparing the patient for surgery and anesthesia during its duration. Another function play an Intensive Care units. The main task of these units is to maintain and monitor vital functions undergoing collapse, because the branch is getting patients in extremis. Demand for space in the ICU is still increasing, which is caused by, among others, aging population and an expanding list of clinical conditions that require intensive treatment and supervision. Power may involve the respiratory, circulatory, urinary, gastrointestinal or a few at a time. The variety of pathologies with which patients can get a surprise at any time, so these troops require specialized equipment. Keep in mind that even the best equipment will not guarantee the success of treatment, if the staff will not be able to handle it. The effectiveness of therapy therefore depends on the spatial organization of the branch, equipment and personnel qualifications and frequencies, including nursing staff. [1-4]

Working nurse anesthesia is associated with exposure to harmful factors, ie. The ergonomic, psychosocial, physical, chemical and biological. This aspect is important because of the workload of nurses, their health and patient safety, quality of care and the related adverse events, errors, accidents at work. A large number of threats due to the

working conditions offered by the particular employer resources of those institutions, which determine the comfort (including human resources), zmianowości nurses, specificity and diversity of tasks and organization of work in a team. We call harmful factors by such factors by which the impact occurs to the deterioration of the health worker, and as a result of the schorzenia- occupational disease. While the workload is due to the degree of employee involvement in the execution of its tasks and the health consequences of this commitment. According to G. Gaweł [5] workload can be respected as the sum of the requirements that are placed on the employee to perform the task, and as the impact of job requirements and skills to cope with them by the employee. The possibility of countermeasures may include resistance to emotional reactivity of the nervous system, intelligence, psychomotor performance, the ability to remember and so on.

For each nurse the effects of workload may be different depending on the individual possibilities and how to cope with difficulties. As a result, the person performing the same work experience varying degrees of load and various effects interactions same factors [6-9].

Aim of the work:

The aim of the study was to analyze psychological burden anesthetic nurses.

Material and research methods:

The survey was conducted from January 2016 to January 2017 year among nurses working in the Clinical Department of Anesthesiology and Intensive Care 4 Military Clinical Hospital in Wroclaw. The study was attended by 54 people, including 52 women and 2 men. Each of the study participants was informed about the purpose and principles of research. The subjects filled a questionnaire individually. The criterion for inclusion in an agreement to share. Examined respondents were informed about the conduct of the survey. Also reported that the questionnaire can be filled at a convenient time for them, and may refrain from fulfilling his every step.

For the purpose of gathering research material to the following method was used to develop diagnostic survey using the following research tools:

1. Authors' socio-demographic survey on gender, age, education, jobs, work experience (years), position, hospital, extra work, possessed qualifications, health status
2. Another research tool was a Questionnaire assessment of mental workload consists of 3 domains - load information containing 8 questions in three stages, the load monotony containing 4 questions, and load psychonerwowego containing 20 questions [10].

All statistical calculations were performed using the statistical package StatSoft, Inc. (2011) Statistica version 10.0 and Excel spreadsheet. To describe the structure used in the study population frequencies (N) and percentage (percentage). Quantitative variables were characterized by the arithmetic mean, standard deviation, median, minimum and maximum values.

Results:

Specific characteristics of the test is shown in Table 1 and 2.

Table 1. General Information about the respondents:

		N	%
Sex	Woman	52	96.3
	Man	2	3.7
Education	Medical highschool	26	48.1
	Bachelor of Nursing	21	38.9
	Master of Nursing	7	13.0
Are you an expert in anesthesia nursing?	Yes	27	50.0
	No	27	50.0
Does your job satisfy you?	Yes	45	83.3
	No	9	16.7
	altogether	54	100.0

In the study group was dominated by female persons with a professional nursing education (high school and medical BCs), half of the respondents had a specialization in nursing anesthesia and intensive care. More than 80% of the work is satisfactory.

Table 2. General respondents

	N	M	Me	SD	min	max
Age	54	42.70	48,00	11.624	22	60
Seniority in the profession of nurse / nurse	54	21.38	27.00	12.983	0.1	40
Seniority in the department of Anesthesiology and Intensive Care	54	18.43	20.50	13.003	0.1	40

Age of the youngest respondents was 22 years old, while the oldest age of 60 years. The average age is 42.7 years, the median is 48.00, and the sample standard deviation is 11.624.

The shortest length of service in the profession of nurse / nurse was one month, while the longest 40 years. The average seniority in the profession is 21.38 years, the median is 27.00 and the standard deviation of 12.983.

The shortest length of service in the department of Anesthesiology and Intensive Care was 1 month, while the longest 40 years. The average length of service in the ward is 18.43 years, the median is 20.5 and the standard deviation of 13.003.

Survey results Questionnaire psychological burden

For each part of the questionnaire is calculated multiplicity psychological burden, modal, median, minimum, maximum, and standard deviation

The first part of Mental Loads domain consists of the receipt of information concerning -7 statements, the part concerning the subtraction decision - 7 statements and perform actions on the part of -7 statements.

Tab. 3. The values of the domain of mental workload

Receiving	N	M	Me	SD	min	max
The frequency of the information flow	54	4.46	5.0	0.745	2	5
variability information	54	3.96	4.0	1,098	1	5
uncertainty information	54	3.57	4.0	1,340	1	5
complexity of the information	54	4.41	5.0	0.813	2	5
The inaccuracy of information	54	3.85	4.0	1,204	1	5
validity of information	54	4.61	5.0	0.656	2	5
time stress	54	4.69	5.0	0.609	2	5
Decision-making	N	M	Me	SD	min	max
The frequency of the information flow	54	4.44	5.0	0.664	3	5
variability information	54	4.15	4.0	0.920	1	5
uncertainty information	54	3.85	4.0	1,139	1	5
complexity of the information	54	4.48	5.0	0.841	2	5
The inaccuracy of information	54	3.89	4.0	1,160	1	5
validity of information	54	4.52	5.0	0.720	2	5
time stress	54	4.67	5.0	0.549	3	5

Taking action	N	M	Me	SD	min	max
The frequency of the information flow	54	4.48	5.0	0.771	2	5
variability information	54	4.04	4.0	0.990	1	5
uncertainty information	54	3.89	4.0	1,058	1	5
complexity of the information	54	4.46	5.0	0.719	2	5
The inaccuracy of information	54	4.09	4.0	1,137	1	5
validity of information	54	4.67	5.0	0.549	3	5
time stress	54	4.67	5.0	0.583	2	5

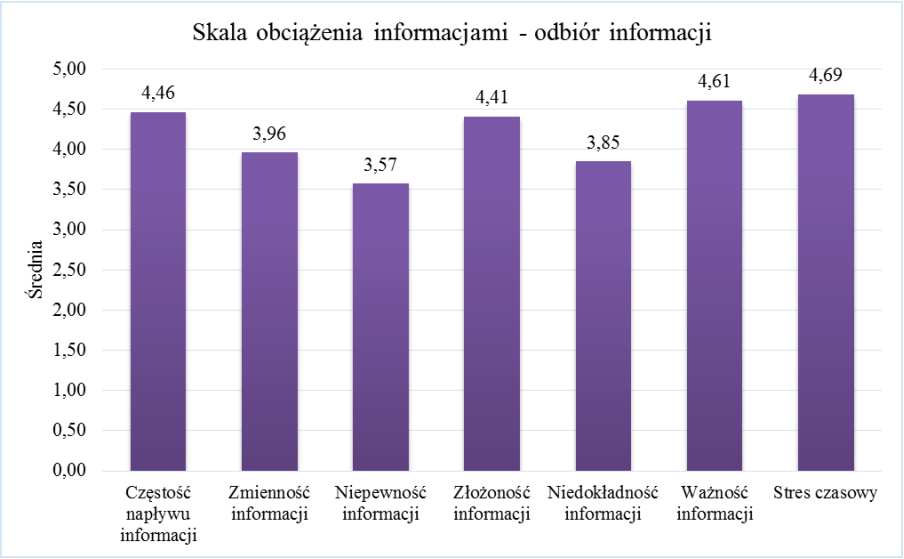


Fig.2. Scale load information - information retrieval

In most parts of the receipt of information indicated by the nurses studied stress response was temporary and averaged 4.69 points. The least frequent response indicated in this part of the scale was the uncertainty information.

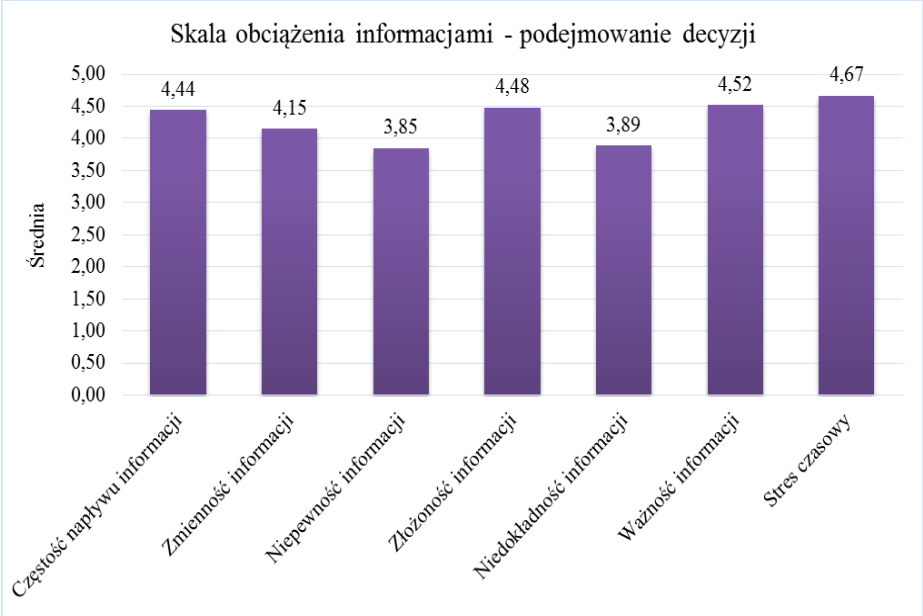


Fig.3. Scale load information - decision making

In the decision indicated by most nurses studied stress response was temporary and averaged 4.67 points. The least frequent response indicated in this part of the scale was also uncertainty information.

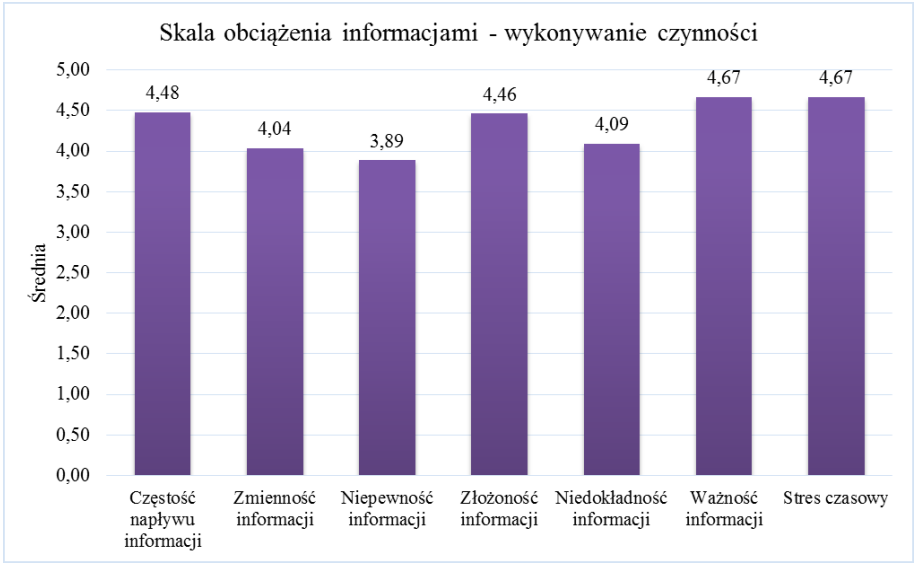


Fig. 4. Scale load information - performing activities

In the performing activities most frequently indicated by the surveyed nurses was the response time and stress the importance of information and they amounted to an average of 4.67 points and. The least frequent response indicated in this part of the scale was the uncertainty information.

Tab. 4. The sum of the partial loads scale information

Scale load information	N	M	Me	SD	min	max
Receiving - TOTAL	54	29.56	29.0	3,689	21	35
Decision making - TOTAL	54	29.91	30.0	3,738	22	35
Performing activities - TOTAL	54	31.06	30.0	6.643	22	35
Scale load information - the result of the combined	54	**90.52**	88.5	11.436	69	105

Tab. 5. The evaluation scale information Loads

Stage Feature information:	Receiving	Decision-making	Taking action
the frequency of the information flow	4.46	4.44	4.48
variability information	3.96	4.15	4.04
uncertainty information	3.57	3.85	3.89
complexity of the information	4.41	4.48	4.46
the inaccuracy of information	3.85	3.89	4.09
validity of information	4.61	4.52	4.67
time stress	4.69	4.67	4.67
TOGETHER	29.56	29.91	31.06
The total cumulative assessment: 90.52 points			

Assessment of the total for the three parts of the load information calculated by summing the average point values of the three test stages.

Scoring 1-30 means a small load

Score of 31-70 means the average load

Score of 71-90 means a heavy burden

Scoring 91-105 means a very heavy load information in the workplace.
The total cumulative score for the three stages of the assessment scale load information is 90.52 points. which means a heavy load information in the group of nurses anesthetia

The second part of domain loads Monotonie

The evaluation was carried out to load the monotony of a 5-point scale before taking into account the degree of arduous work, where 1 is the lowest rating, 5 highest rating,

1. immutability (uniformity) of the process of work,
2. immutability of working conditions - the environment,
3. the need to maintain constant alertness,
4. the complexity of operations.

The degree of monotony indicates the amount of common characteristics:
High - presence of all 4 features
Average - the presence of 3 qualities
Small -występowanie 1 or 2 features.

Domain monotonous load is also calculated cardinality, modal, median, minimum, maximum, and standard deviation

Tab.6. Domain load monotony

load monotony	N	M	Me	SD	min	max
The monotony of the work process	54	3.96	4.00	1,273	1	5
Uniformity environment	54	3.74	4.00	1,200	1	5
The necessity of constant voltage	54	4.15	5,000	1,144	1.0	5.0
Very easy to work, intellect nieangażująca	54	4.78	5.00	0.572	3	5
Domain load monotony - the result of the combined	54	16,63	17,000	2,559	10.5	20.0

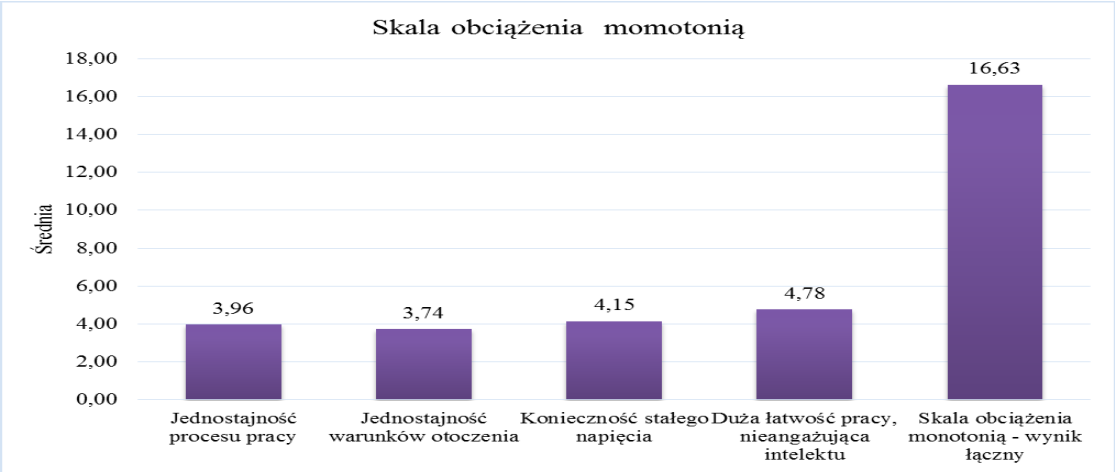


Fig. 5. The values of the load point scale monotony.

Assessment of the total load is calculated by summing up the monotony of points:

1-5 small load

6-12- average load

13-17 large load

18-20 very large load.

Cumulative total score for the scale point of monotony is 16.63 which means a heavy burden monotony in the group of nurses anesthetic.

Tab.7. The scale of the mental load

load information	90.52
load monotony	16,63
TOGETHER	107.15

To calculate the total load mental summed score scale load information and load scale monotony. The results are as follows:

1-35 points - small load

36-82 breakpoint load average

83-107 punktów- big load

108-125 very large load

The total psychological burden on the position of nurse anesthesia amounted to 107, 15 pts., Which means a large load.

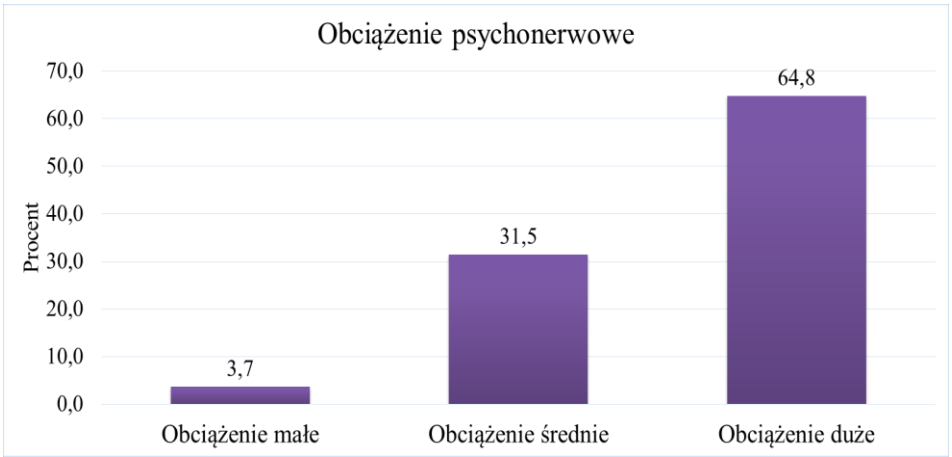
An additional tool to evaluate the load is psychonerwowego checklist contains 20 questions to which respondents could answer yes - 1 point or not - 0 points. The sum is 3 points below the low load psychonerwowe, 4-11 load and average 12 or more points - a big load.

Table 8. Psychonerwowego load rating - CHECKLIST - general answers.

lp	Load	Yes		no	
		N	%	n	%
1	Work with short cycles (under 90s) is common	11	20.4	43	79.6
2	Monotonous and difficult tasks are common (these are tasks that quickly become a routine)	31	57.4	23	42.6
3	Tasks requiring a very high concentration (those that can not be come off) are common	52	96.3	2	3.7
4	The work is divided into small parts, each worker performs only a tiny part of the whole	19	35.2	35	64.8
5	The work is demanding emotional (eg. Because it requires contacts with patients)	48	88.9	6	11.1
6	The work is often done under time pressure and deadlines	49	90.7	5	9.3
7	The ward are single position	26	48.1	28	51.9
8	It often happens that the organization is invalid	37	68.5	17	31.5
9	Often, the other branches are unprepared	42	77.8	12	22.2
10	Often, the other branches do not provide sufficient support	37	68.5	17	31.5
11	Often there are problems with the hardware (malfunction, spoiling apparatus, instruments, software)	22	40.7	32	59.3
12	There is regular consultation work or they do not give the possibility to discuss problems with the work	40	74.1	14	25.9
13	Self-regulation of the rate of the employee his work is impossible or difficult	36	66.7	18	33.3
14	It is not possible or is very difficult to employee defined its working methods	26	48.1	28	51.9
15	Hindered the possibility of mutual assistance workers	15	27.8	39	72.2
16	There is a lack of sufficient information on the results of their work	23	42.6	31	57.4
17	During the day there is no time for a short chat with colleagues	33	61.1	21	38.9
18	Often there is no possibility of contact with supervisors to discuss problems	27	50.0	27	50.0
19	Difficulties in direct contact with colleagues or superiors from another branch to discuss your problem	38	70.4	16	29.6
20	There is a large number of conflicts at work	27	50.0	27	50.0

Tab.9. Psychological stress

Psychological stress			
		Frequency	Percent
	load small	2	3.7
	load average	17	31.5
	load large	35	64.8
	altogether	54	100.0



Dig. 6. Psychological stress- points

CHECKLIST by psychonerwowego load, the majority of anesthesiology nurses (n = 35) is characterized by large load psychonerwowe.

Discussion

Respondents in the assessment of mental load on the scale load information judged individual features information on a scale of 1 to 5 in three stages: receipt of information, decision-making and performing. Summing up the results: at the stage of receiving information fewest points was 21, while the highest 35, the average score of all answers is 29.56. At the stage of decision-making was the fewest points total of 22 points, and the highest 35, the average performance is 29.91. At the stage of carrying out activities fewest points was 22, while the highest 35, the average response rate was 31.06. The average total score is 90.56, which can be determined by the study group for the information load is high. Dorothy A. Ksykiewicz-in his work showed thatnurse within an hour has an average of nine

information, take six decisions, performs five tasks and contacts with four people [11]. Despite the growth of autonomy in the profession, nurses are still rarely take own decisions based on the information obtained.

Another part of the scale was part of the psychological burden on the load monotony, which evaluated the immutability of the process and working conditions, the need for constant attention and the degree of complexity of the activities performed. Repeatability at work, the monotony can contribute to reducing the concentration and thus increase the risk of error, accident or injury [11-13]. The fewest points was 10.5, and the highest 20. The average total score of 16.63 which indicates a large load monotony of respondents. This result is surprising given the working conditions of nurses, the dynamics of the health of patients and the variety of activities undertaken nursing and medicine. They have not been studied monotony load among nursing staff.

The sum of the results obtained using Scale psychological burden shows that the total study group psychological burden is high (an average of 107.15 pts.).
Psychonerwowego load scale revealed that only 2 of the subjects (3.7%) are charged to a small degree, 17 patients (31.5%) in the medium degree, and more than połowa- 35 patients (64.8%), as far as a. Least likely to receive an answer confirming Question 1 "Working with short cycles (under 90s) is a frequent" - 11 people (20.4%), the most common question 3 "Tasks requiring a very high concentration (such from which you can not get away) are frequent "- 52 people (96.3%).

Conclusions

1. Nurse Anesthetists are heavily burdened with work.
2. Anesthetic nurses working in the Intensive Care is characterized by large load information, a large load monotony and large psychological burden.
3. Most nurses anesthetic characterized by large load psychonerwowe.
4. There is a need to analyze the reasons for this.

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