

Stress assessment by anaesthesiologists and nurses working in paediatric intensive care units

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Abstract. Paediatric intensive care units (PICU) play a special role in the therapy of critically ill children. The physicians (anaesthesiologists) and nurses are at a particular risk of job-related stress because continuous work stress can lead to psychological and physical disturbances. The aim of the study was to assess the stress level among the anaesthesiologists and nurses in the PICU. The anaesthesiologists and nurses (104), recruited from five university hospital centres in Poland, participated in the study between 2005-2008. The participants were asked how they estimate the stress level at work, both in general and specific in relation to working in the PICU. Both tested groups estimated the stressfulness of their job in the PICU as high or very high. The most stressful factors for doctors were: decision on limitation of intensive therapy, giving information to parents about a child's death and stressful attitude towards challenging clinical cases. For nurses, the stressful-factors included witnessing the parents' reaction to critical state of their child and/or child's death. The anaesthesiologists and nurses working in the PICU are very stressed and in their opinion work in intensive unit is much more stressful than other jobs. Even though the stress job-related factors are well known the methods to cope with them seem to be insufficient. Based on our research, we argue that the medical team in the PICU should develop and realize competences of stress management or psychological support.

Key words: Job-related stress, nurses, occupational health paediatric intensive care unit, physicians,

1. Introduction

Working as a physician evokes special feelings and challenges. It is usually associated with high pressure of emotions and thus is considered extremely stressful. To understand better the idea of stress, we provide here some of its better known definitions. Michie described stress as the psychological and physical state that occurs when the resources of the individual are not sufficient to cope with the demands and pressure of the situation (1). Payne on the other hand, defined

stress as a process which causes or precipitates individuals to believe they are unable to cope with the situation facing them (2). If stress is not high, an individual can feel anxiety, tension, frustration and sometimes anger.

The high level of stress as well as sustained stress may lead to physical health problems along with psychological problems. Physicians are at particular risk of stress at work and continuous work stress can lead to psychological morbidity (3,4), alcohol abuse resulting in alcohol dependence (5), impaired quality of life, depressive reactions and even suicides (6,7). Not all physicians are influenced by the same stressors and this process depends on their position at work (consultants had higher level of stress than junior physicians) (8), their gender (women are more sensitive to stress than men) (9) and their speciality. The most sensitive to stress are physicians working in emergency departments and at intensive care units (ICU) (10).

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Received: 11.04.2011

Accepted: 31.08.2012

Table 1. Demographic data

	Anaesthesiologists n=35		Nurses n=67	
Gender F-female % (n), M-male % (n)	F-77 (27)	M-23 (8)	F-95.5 (64)	M-4.5 (3)
Age				
< 40years % (n)	34 (12)		76 (51)	
> 40years % (n)	66 (23)		24 (16)	
Work in the PICU				
< 10years % (n)	40 (14)		58 (39)	
> 10years % (n)	60 (21)		42 (28)	
Married Yes % (n)	74 (26)		59 (40)	
Children Yes % (n)	80 (28)		58 (39)	
Financial status Satisfied Yes % (n)	74 (26)		47 (32)	
S-smokers Yes % (n)	25 (9)		29 (20)	

The special feature of intensive medicine is a high level of stress among professionals (11). These specific wards provided in Poland by anaesthesiologists are mostly orientated to treat critically ill patients who are unconscious, intubated, artificially ventilated and remain there or weeks and months.

The paediatric intensive care units (PICUs) seem to be more stressful than adult ICUs because paediatric patients are younger and they cannot decide about their own treatment, so a frequent contact with their parents is necessary. Talking with the parents of the severely ill child is very emotional and the physicians are under a tremendous pressure during this stressful situation. Dealing with patients' families was the most frequently cited job stressor (12). Additionally, treating infants and children who would not otherwise be alive could be important stressor in aspect of life value at any cost (13).

There are many members of hospital staff apart from physicians involved in the treatment of critically ill patients. Nurses are one of the most important group of health workers. They are also first contact provider who can find and recognise a patient's problem sooner than other staff. In the ICU are influenced the same stress factors as the physician group.

The aim of the study was to assess and compare the stress level among anaesthesiologists and nurses working in paediatric intensive care units because of insufficient data in this area existing in Poland.

After approval by the Institutional Review Board, Ethics Committee and agreement of participants thirty five anaesthesiologists (27 female, 8 male) and sixty seven nurses (64 female, 3 male) were involved into the study between 2005-2007. We chose randomised five

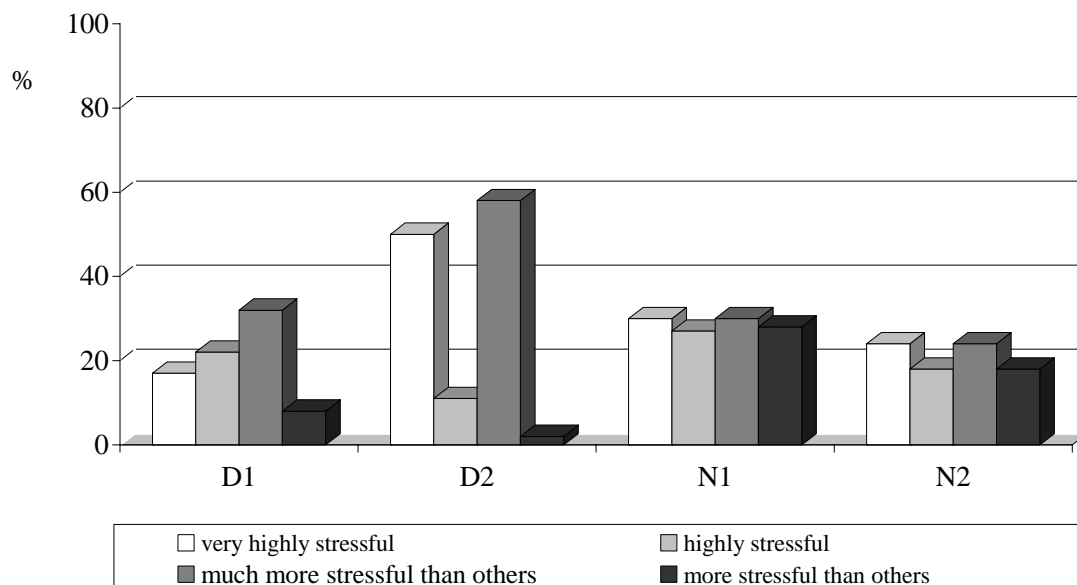
main university hospital centres with paediatric intensive care units (PICU) among the total number of ten centres in Poland. In our country anaesthesiology is a specialization which covers anaesthesia and intensive care.

We used ten years of working in the PICU as a critical determinant and that is why we subdivided both anaesthesiologists and nurses into two groups according to the length of work experience in the PICU. In anaesthesiologist group marked as D1 – experience in the PICU was less than ten years and – D2 when the experience was more than ten years. In the nurse-s group marked as N1 the experience in the PICU was less than ten years, where N2 shows that this experience was – more than ten years.

The participants filled an anonymous two section questionnaire provided to them by mail to the chiefs of the departments. The first section was demographic data and the other section contained questions related to stress among anaesthesiologists and nurses working in the PICU. We sent out 150 questionnaires and we received back more than 70% (i.e. 104 questionnaires) of them.

First, the participants had to fill in demographic data such as: gender, age (less or over 40 years old), duration of work in the PICU, married or not, having children, financial status, smoking or not (presented in Table 1).

The participants were asked how they estimate the stress level at work both in general and specifically in relation to working in the PICU. Next question was about their feelings concerning the relationship between stress level and years of work and job experience in the PICU. Another group of questions described ten most common real situations in the PICU, characteristic for physicians and nurses. The tested group had to



D1 anaesthesiologist with experience in the PICU less than 10 years
D2 anaesthesiologist with experience in the PICU more than 10 years
N1 nurses with experience in the PICU less than 10 years
N2 nurses with experience in the PICU more than 10 years

Fig. 1. Participants' opinion how deeply stressful is their job in the PICU generally and in comparison to other jobs?

estimate stress level related to them (e.g. conversation with the parents about the critically ill child, the need of accurate decisions, projection of treated child with their own child, the child's death in the PICU). The next question was to assess the influence of the stress level on the relations between anaesthesiologists and nurses and supervisors, co-workers, as well as parents and patient's relatives. The last question aimed to estimate the level of satisfaction associated with working in the PICU.

2. Results

We received more than 70% filled questionnaires. The characteristic of the tested group is presented in Table 1.

The tested cohorts consisted mostly of females (91 women among the total of 102 participants), both in anaesthesiologist and nurse groups. Anaesthesiologists were older than 40 years (66%), in contrast to nurses group where 76% were younger than 40 years of age. Anaesthesiologists work experience in the PICU was higher (60% worked more than ten years)

than nurses (53% worked less than ten years). The ratio of married anaesthesiologists (74%) was higher than nurses (59%). Nearly 42% of nurses and 20% of anaesthesiologists did not have own children. The satisfaction with financial status among anaesthesiologists was better in comparison to nurses, where only half of them were satisfied with their salaries. In anaesthesiology group 75% declared as non-smokers similar to nurses (71%).

Both anaesthesiologists and nurses estimated the stressfulness of their job in the PICU as high or very high comparing to other jobs. These results are presented in the Figure 1.

In the next question we analyzed their feelings concerning the relationship between stress level and years of work and job experience. Among anaesthesiologists almost 40% wrote that job-related stress level was rising with the years of experience in the PICU. Similarly to the doctors' group, one-third of nurses assessed stress level as rising while the next one-third estimated its level as no changing in relation to the length of PICU practice.

Table 2. Estimated number of stress level by the anaesthesiologists in the PICU (n=35, D1=14, D2=21)*

PICU stress factors	Very high stress		High stress		Average stress		Low stress		Cannot assess	
	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
Decision on therapeutic method	1	2	3	4	10	12		3		
Decision on limitation of intensive therapy	9	10	5	7		3		1		
Closed relation with difficult clinical cases	3	3	7	11	3	6	1	1		
Giving information to parents about child's death	11	18	3	2				1		
Presence of parents in the PICU	1	2	3	3	4	11	6	5		
Conversation with the parents about the critically ill child	4	4	3	8	6	8	1	1		
Identification of treated child with the own child	3	8	4	7	4		2	2	1	4
Child's death at PICU	9	16	4	4	1			1		
Supervisor's comments realisation	1	1	2	1	2	7	9	12		
Need of accurate decisions	1	2	2	3	9	12	2	4		

*D1- anaesthesiologist with experience in the PICU less than 10 years

D2 - anaesthesiologist with experience in the PICU more than 10 years

The estimation of the most common real situations in the PICU made by anaesthesiologists and nurses is presented in Table 2 and Table 3.

The most stressful factors for anaesthesiologists were: decision on limitation of intensive therapy, giving information to parents about child's death and highly stressful-closed relation to challenging clinical cases. For nurses, the stressful-factors included witnessing the patient's parents' reaction to critical state of their child and/or child's death. Average and low stress factors for anaesthesiologists included decision on therapeutic method and presence of parents in the PICU, and for nurses daily nursing in the PICU and nursing the child with limited intensive therapy. Both groups estimated as highly or as very highly stressful the projection of treated child with the own child and child's death in the PICU. Conversation with the parents of critically ill child was assessed similarly as average or highly stressful in both the groups. The need of accurate decisions making was judged by nurses as highly or very highly stressful in contrast to physicians who estimated it at average and low stress level.

The assessment of the importance of acceptable behaviour of different health providers in the PICU on the stress level in anaesthesiologists and nurses is presented in Table 4.

For anaesthesiologists working less than ten years in the PICU, acceptance of supervisors and co-workers was considered very important but in group working more than ten years only half of them estimated their acceptance as important. They also estimated patients' and their parents or relatives acceptance as important.

For nurses the length of working in the PICU was not the determinant factor when they estimated supervisors and co-workers acceptance. They assessed it as very important. The acceptance of patients' and their parents or relatives was estimated as very important for the nurses working more than ten years and equally as very important and important for the group of nurses working less than ten years.

Finally we asked about the satisfaction of working in the PICU. Half of the participating anaesthesiologists were satisfied while two equal groups of 25% described their satisfaction as either very high or non-existent. Very high

Table 3. Estimated number of stress level by the nurses in the PICU (n=67, N1=39, N2=28)*

PICU stress factors	Very high stress		High stress		Average stress		Low stress		Cannot assess	
	N1	N2	N1	N2	N1	N2	N1	N2	N1	N2
Daily nursing in the PICU	2	2	6	6	20	11	10	8	1	1
Nursing the child with limited intensive therapy	2	2	7	4	17	10	12	10	1	2
Contact with the parents' reaction to critical state of their child	13	7	20	12	6	7		1		1
Contact with the parents' reactions to child's death	29	21	9	6	1					1
Conversation with the critically ill child	4	2	9	7	14	8	6	6	6	5
Conversation with the parents of critically ill child	6	6	15	8	11	9	6	4	1	1
Identification of treated child with the own child	27	18	6	8	4	1			2	1
Child's death in the PICU	28	18	10	9	1					1
Doctor's comments realisation	3	5	8	4	21	11	7	7		1
Need of accurate owns' decisions	11	7	16	8	10	9	1	2	1	2

*N1- nurses with experience in the PICU less than 10 years
 N2 - nurses with experience in the PICU more than 10 years

Table 4. Importance of acceptable behaviour of different people in the PICU estimated by anaesthesiologists (n=35, D1=14, D2=21) and nurses (n=67, N1=39, N2=28)*

	Very important		Important		Less important		Not important		Cannot assess	
	Doctors									
	D1	D2	D1	D2	D1	D2	D1	D2	D1	D2
Supervisors	13	11	1	10						
Co-workers	12	11	2	10						
Patients-children	5	7	9	12						1
Parents and/or relatives	7	8	7	13						
	Nurses									
	N1	N2	N1	N2	N1	N2	N1	N2	N1	N2
Supervisors	28	24	11	4						
Co-workers	30	24	9	4						
Patients-children	21	18	16	8	2					2
Parents and/or relatives	18	18	20	10	1					

*D1- anaesthesiologist with experience in the PICU less than 10 years
 D2 - anaesthesiologist with experience in the PICU more than 10 years
 N1- nurses with experience in the PICU less than 10 years
 N2 - nurses with experience in the PICU more than 10 years

satisfaction was noted among 25% of nurses, average level by 33% and no satisfaction also among 33%.

3. Discussion

Paediatric intensive care units (PICU) play a special role among wards in a hospital during the treatment of critically ill children. Paediatric patients are specific due to many factors such as: size, age, lack of own legal responsibility and need of parents' agreement for some medical procedures, which is in contrast to adult patients. Additionally, specific conditions in the environment in the PICU could be responsible for generation of other sources of stress factors. Nurses in the United Kingdom informed that working against the clock, excessive noise or undue quiet, unpleasant sights and sounds are equally stressful in critical care (14).

In our research the majority of physicians - anaesthesiologists and nurses working in the PICU estimated their work as highly or very highly stressful comparing to other jobs (11). Many authors reported (previously) very high stress level among paediatric nurses (15). When comparing the PICU-related stress factors with other medical professions, their assessment of stress was similar to our research. The same opinion was presented in the article coming from Hong Kong where intensive care nurses were more stressed than nurses working in other areas (16). Working in intensive care unit where dealing with stress is very common, reflected endocrine response. Fischer reported that paediatric intensive care physicians and nurses experienced endocrine reaction every second workday. This reaction was comparable to other stressful situations such as: first time skydives, tooth extractions or important academic examinations (17).

In our research we analyzed physicians' and nurses' feelings concerning the relationship between stress level and years of job experience. Ten years of working in the PICU was a border. Almost 40% of anaesthesiologists assessed that job-related stress level as rising with the years of experience in the PICU but one-third of nurses assessed stress level as rising while the next one-third estimated its level as no changing in relation to the length of PICU practice. Kawasaki et al. also used ten years of experience as significant factor of work stress among anaesthesiologists in Japan (18).

The most stressful factor in our research for both the paediatric intensivists (anaesthesiologists) and intensive care nurses in critical care units was child's death as reported

presented by 99% of doctors and by 97% of nurses. Similar findings were reported by many authors all over the world (19-21). We have distinguished the factors typical for physicians such as giving information to parents about child's death and for nurses like witnessing the parents' reaction to a child's death. These experiences were estimated similarly as very highly stressful by both groups. Not surprisingly, it seems to be a typical human psychological reaction and it is impossible to distance oneself to any death. Although working in ICU unit brings more experiences dealing with death than in any other hospital wards, patient's death remains a very stressful factor (15). For therapeutic team in the PICU closed emotional relations to patients are usually present continuously day by day. For most members of the intensive team, contact with the patient is not finished at the moment when they leave the hospital but is taken in their minds outside working place. It is difficult to forget about critically ill patients, even outside hospital. Nurses and physicians still think about them at home. They try to cope with the stress reaction home by trying to use the best method they know. Unfortunately most of them are deleterious for their health, e.g. smoking, taking drugs, drinking alcohol (22) or eating more (23). Surprisingly 70% of our respondents declared as non smokers which seemed to be false because based on the other data about 40% of doctors and 70% of nurses are smokers. The only explanation of this presumably inconsistent declaration was a suspected embarrassment because of the chosen method of coping with stress by smoking.

There more friendly coping strategies which include for example support from supervisors and co-workers. We have observed the same strategy in our research because all physicians and nurses assessed this type of support as important or very important factor. In contrast to our results, Callaghan found this strategy only in 38% nurses (15).

More than 50 % of our nurses were unsatisfied with their salaries, which is also stress factor identified among the others. Poor benefit and poor payment were distinguished very strongly by the nurses as reported by Lau (16).

All physicians and nurses working in the PICU who participated in our research were over-worked, similarly to many results presented by the authors not only from Western but also from Eastern Europe.

They authors concluded that long working hours and over-working are still the most important factors for job dissatisfaction and stress (9-18-24-27). Over-working influences the

quality of life not only at work but also outside the hospital and finally effects psychological and emotional long-lasting disturbances. One of the researches showed for example that physicians are chronically aroused (28). The other author presented the poor performance of stressful work by nurses and physicians reflected by lower self-esteem, feeling of inadequacy, irritability, depression, somatic disturbances, sleep disorders and burnout (29, 30).

Physicians and nurses working in the PICU have not enough time to relax at work and even if they can rest for a few minutes, the quality of resting is not adequate due to their continuous alert. The evidences demonstrated that worker who is expected to be often woken-up showed greater sleepiness the following day (31).

In Poland there is no separate specialty in intensive therapy. The anaesthesiologists work in Intensive Care Units mostly. Many of them rotate and work partially at operating theatre and intensive care unit, but the leaders spend full time in ICU as well as nurses. The full-time workers are under the highest risk factors. In our opinion this rotation seems to be one of the methods to decrease the stress level. If rotation is impossible we propose psychological support both for anaesthesiologists and nurses.

All presented job-relating factors influenced on rising of stress and decreased the quality of life among the physicians and nurses working in the PICU and cause higher stress in comparison to the other health workers (32).

4. Conclusion

The anaesthesiologists and nurses working in the PICU are very stressed and in their opinion work in intensive unit is much more stressful than other jobs. After very detailed analysis of the participants' answers the most stressful factors were: child's death and giving information about this to the parents. Even the stress job-related factors are well known the methods to cope with them seem to be insufficient. Based on our research we argue that the medical team in the PICU should develop and realize competences of stress management (33). Similarly to other stressful professions (e.g. firemen, policemen) this group of hospital workers need to undergo frequent psychological counseling.

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