Original Article Pol J Public Health 2016;126(4): 165-169

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Meta-analysis of pain and stress in emergency department patients

Abstract

Introduction. In Poland, among patients coming to hospital emergency departments (ED), one third require immediate surgical treatment. About one third are transferred to long-term intensive care. The remaining patients require a different type of care, e.g. consultation, healing wounds, observation in the emergency department. From there, they might either be referred to another hospital department or sent home after receiving outpatient help.

Aim. The aim of this study was to determine the prevalence of pain and stress in patients treated in the emergency department with particular emphasis on the factors that determine their level.

Material and methods. The study group consisted of 200 individuals treated in the emergency department of the Regional Hospital No. 2 in Rzeszów in 2013. The applied research method was a diagnostic survey that used a questionnaire as a research tool. The results were statistically analyzed using SPSS 20, whereas a statistically significant dependence was considered in those with level of significance $p \leq 0.05$.

Results. Most respondents reported pain and feelings of stress while staying in the ED. Women and the unemployed were significantly less likely to report pain. Factors like gender, age, education level, and the coexistence of chronic diseases significantly affected the degree of stress among patients in the ED.

Conclusion. Each patient treated at the emergency department should receive holistic care, so that the pain and stress of his injuries are reduced as soon as possible.

Keywords: emergency department, hospital, pain, pain management, stress, patient satisfaction, quality of health care.

DOI: 10.1515/pjph-2016-0034

INTRODUCTION

In Poland, The National Emergency Medical Services implemented tasks that ensure assistance to any person listed in the emergency health system. The EMS system provides benefits of health care to people in a medical emergency including the emergency department (ED). The ED is an organizational unit of a hospital meeting the requirements set in the national bill on the Emergency Medical Services and granting health care benefits consisting of the initial diagnosis and providing the treatment to the extent necessary for the stabilization of vital functions of people who are in an emergency resulting e.g. from trauma. Injury following trauma is one of the most serious challenges to modern medicine. In Poland, trauma is the third major cause of death (preceded by cardiovascular diseases and cancer). Most of these deaths happen as a consequence of traffic injuries but accidents also tend to happen at work and at school.

Excess mortality due to emergency reasons in Poland is four times higher than in Western countries. That concern is not only related to trauma statistic but also to the severe risks of cardiovascular, cerebrovascular strokes, etc. Among patients coming to the ED one third require immediate surgical treatment. About one third are transferred to long-term intensive care. The remaining patients require a different type of care, e.g. consultation, fixing wounds, observation in the emergency department. From there are either referred to other hospital departments or sent home after receiving outpatient help.

AIM

The aim of this study was to determine the prevalence of pain and stress in patients treated in the emergency department with a particular emphasis put on the factors that determine their level.

MATERIAL AND METHODS

The study was conducted at the emergency department of the Regional Hospital No. 2 in Rzeszow in February and March of 2013. The study involved 200 patients. The study excluded unconscious patients, aggressive patients under the influence of alcohol or drugs, severely injured patients

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and those under 18 years of age. An original questionnaire was used as a research instrument. It consisted of 23 multiple choice questions and the provision for own answers. The first part of the questionnaire included questions collecting participants' socio-demographic data i.e. age, sex, place of residence, education level, professional activity and marital status. The second part of the questionnaire contained questions about the reason for staying in the ED and the level of intensity of pain and stress for the patients. The results were subjected to statistical analysis using SPSS 20. A statistical significance was based on results with level of significance $p \leq 0.05$. The data was presented using basic descriptive statistics: the standard deviation and variance. In order to investigate whether there is a statistically significant relationship between the described characteristics, independence test Chi^2 and Ch^2 corrected for continuity were implemented.

RESULTS

Women (55%) and individuals aged 18-30 (38.5%) constituted the largest group of respondents. Most respondents had secondary education (37.5%) and were residents of the city of Rzeszow (40.5%). A majority of those surveyed (55.5%) worked professionally and were either married or had a partner (79.0%).

Among the respondents, 46.5% made their own way to the ED, 39% of respondents were brought to the emergency department by the emergency medical services (ZRM in Polish), while a local GP referred 14.5%. The majority of the respondents were accompanied to the ED (57.5%). The subjects were brought to SOR usually because of traumas (33%), and cardiac events (20.5%), surgeries (18%), pulmonary disorders (6.5%), and neurologic reasons (6%).

The remaining patients (16%) came to the emergency department for different reasons and therefore, were not assigned to any group.

The vast majority of respondents (87%) reported pain while in the ED; 40% identified it as strong on a five-point scale of intensity of pain (no pain, pain, light, moderate, strong, unbearable). When asked about the nature of the pain, usually it was defined as sharp and hard to describe. 68% of respondents did not feel that staying in the ED increased their pain, while almost one in five respondents (18.5%) felt an increased soreness.

86.5% of the respondents while in the ED expressed a feeling of stress, 28% of which identified it as light, when surveyed on a scale out of five for the intensity of experienced stress (no stress, stress, light, moderate, strong, numbing). When listing the most common symptoms of stress, an increased heart rate (22.7%), and sweating (18.1%) were the most frequently mentioned ones. Most respondents (55%) did not declare that the stay in the ED increased their stress levels, however, 36% of the respondents felt this intensify during the stay. The most commonly mentioned causes of stress worsening were the state of health (19%), diagnostic tests (16.9%), and stay in the ED (16.1%).

Studies have shown that 32% of respondents, during the stay in the ED felt the greatest support from the accompanying people, while close to one in four patients (24.5%) pointed to the medical staff. The respondents to the question concerning the changes which would see action in the ED, frequently pointed to reducing the waiting time (39%) and increasing the number of medical personnel (20.5%), while every third respondent (30.5%) saw no need for any changes.

The results of the statistical analysis according to the sensation of pain are presented in Table 1.

TABLE 1. The statistical relationship between the characteristics (pain perception n=200).

Relationship between the age and perception of pain			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	2.803	3	**0.423**
Relationship between the sex and perception of pain			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	11.031	1	0.001
Relationship between the place of residence and the perception of pain			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	0.923	2	**0.630**
Relationship between the level of education and the perception of pain			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	2.297	3	**0.513**
Relationship between the professional activity and the perception of pain			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	20.135	3	**0.000**
Relationship between the marital status and the perception of pain			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	6.993	3	**0.072**
Relationship between the presence of comorbid chronic disease and the perception of pain			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	3.785	1	0.052
Relationship between the the presence of an accompanying person and the perception of pain			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	1.618	1	0.203

*df (degrees of freedom)

The obtained statistical analysis showed that the age of the patients staying in the ED did not affect significantly the degree of pain sensation, similar to place of residence or education level. The gender of patients was a differentiating factor. The results showed that women were statistically less likely than men to report any pain. Statistically significant dependence was also obtained regarding the patients' activity. The unemployed, against other groups statistically, reported pain less frequently. An analysis revealed no statistically significant correlation between the perception of pain by the subjects during the stay in the emergency department and marital status, as well as the presence of accompanying persons or reported in a survey an underlying chronic disease.

The results of the analysis of the statistical dependence of stress, and studied characteristics are presented in Table 2.

TABLE 2. The statistical relationship between the characteristics (stress amplitude n=200).

Relationship between the age and feeling stress			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	16.979	3	**0.001**
Relationship between the sex and the feeling stress			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	5.074	1	0.024
Relationship between the place of residence and feeling stress			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	0.554	2	**0.758**
Relationship between the level of education and feeling stress			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	7.892	3	**0.048**
Relationship between the professional activity and feeling stress			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	5.198	3	**0.158**
Relationship between the marital status and feeling stress			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	7.463	3	**0.059**
Relationship between the presence of comorbid chronic disease and feeling stress			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	5.602	1	0.018
Relationship between the presence of an accompanying person and feeling stress			
Chi-square tests	Value	df*	Asymptotic significance (bilateral)
Pearson's Chi-square	0.168	1	0.682

*df (degrees of freedom)

The resulting statistical analysis showed that the age of the patients staying in the ED significantly affected their stress levels. Studies have shown that members of the 31-45 age group admitted feeling of stress much more often than other age groups. There were similar differences regarding gender. Statistical analysis showed that men were less likely to report stress than women. The study has not shown that either the patients' place of residence or the level of their professional activity levels significantly affected the feeling of stress. Statistical analysis showed no statistically significant correlation between the perception of stress during the stay in the emergency department, and marital status, and the presence of accompanying persons. Respondents who have not been diagnosed with any chronic disease expressed significantly more often, the feeling of stress during their stay in the emergency department than others.

DISCUSSION

As it is clear from the research, as well as the report issued by the Supreme Chamber of Control, up to 80% of patients arriving at emergency departments require no urgent life-saving treatment. Chronic diseases, pains persisting for some time or catarrhal infections are cases where assistance can be given within the framework of specialist clinics, primary night and bank holiday health care clinics. Feeling impatient about waiting in clinics, patients report to the emergency department seeking medical advice, or after the execution of tests, considering a visit to the emergency department as a faster way to get to a specialist. A part of the blame should also be put on primary care doctors. They suggest to patients that if they go to the emergency department, they can be provided with the essential diagnostic tests rather quickly [1]. This makes it difficult to access help for people who need immediate medical intervention. For each patient, taken to an emergency department, in accordance with current guidelines, it is decided whether the patient requires emergency diagnostics, hospitalization and surgery on an ad hoc basis or supply within the emergency department of further diagnosis and therapy [2-4].

The obtained results of the study confirmed these findings, because only 39% of respondents were brought to the emergency department by emergency teams. Our study showed that most patients in the ED were there as a result of trauma. Trauma patients admitted to the emergency department are a group requiring special treatment because of the high probability of loss of life and health [1,5,6]. Based on research conducted by Karavan [7] the injured patients are usually young people. Our study showed that the largest age group of trauma patients were people aged 18-30.

Pain is an unpleasant sensation accompanying both physical and mental illnesses. As far as the psychological pain is concerned, it is defined as an unpleasant sensory effect. Pain is a response to tissue damage and acts as a warning signal. Pain is inextricably linked to negative emotions: fear, anxiety, depression, anger, often accompanied by depression [2,4]. Pain is a subjective sensation and usually it is a primary symptom of a physical illness. Pain triggers defence mechanisms in parts of the body [8,9]. It is estimated that up to 80% of patients admitted to emergency departments feel pain of different severity [10]. This was confirmed by the results of our research, where the vast majority of respondents (87.0%) felt pain while in the ED; of which 40% described it in the questionnaire on the scale of intensity as strong. Research conducted by Kosinski and Siuduta [11] showed that 60% of respondents staying in the ED felt strong pain, with nearly 20% of them wanting to stay in the ED. Similar results were obtained in our studies, because almost every fifth respondent (18.5%) felt during his stay in the ED an increase of pain. This data is similar to the results of studies conducted in other countries [12,13].

The individual factors regarding the way of feeling pain for patients and the preferences might also be of great importance [14-16]. Our findings have shown that women are statistically less frequent to report pain. The perception of pain, except for memory and comparison of experience, also affects emotions. The patient perceives pain when expecting a stimulus (e.g. insertion of needles when drawing blood), and differently when it is unexpected. Assessment of differences in pain sensitivity in men and women is extremely complex due to the variety of factors affecting the sensation of patients. Sociological

and psychological factors are essential to the perception of pain and its expression. There is a theory that men, even though their bodies were biologically designed to face dangers, are stronger and more endurable, did not really have the ability to withstand pain in the same way as a woman, and therefore much more likely to experience it [17]. Increased pain in men can be explained also by their state of health at the moment of arrival at the ED. Men less frequently use health services than women. Lack of previous periodic outpatient medical care in case of deterioration of their health condition results in hospitalization. This suggests that men report to the doctor in a more advanced stage of the disease. Additionally, doctors are more likely to direct men to the hospital suffering from pain than women. This might be due to the belief that men cannot cope with the disease at home and do not abide by these diagnostic and therapeutic rules [18-20]. When analyzing the phenomenon of the perception of pain from the psychological side, it is determined by two parameters: the threshold of sensation of the pain and the threshold of pain tolerance. The threshold of pain sensation is a sensory stimulus intensity that a person experiences as pain. This value is relatively constant and characteristic for every person. Clinical observations show that the lower threshold of pain sensation usually occurs in women and in the elderly. The threshold of pain tolerance is the maximum rate that a person is able to bear. The value of this parameter is variable and dependent on a number of psychological factors. Pain limits humans to focusing on sensations of pain. Concentration on the pain itself affects the subjective sensation of pain by increasing its intensity [21,22].

Our results showed that in the case of women, feelings of stress was expressed statistically more frequently than men. This fact can be explained by the difference of genders' desire to express their own emotions, including the admission of negative emotions. In addition, men have a higher psychological adaptation characterized by the ability to avoid negative emotions, as stress and mental tension [23]. Thoits proved that in a stressful situation women are more likely than men to express their emotions in an open way. According to a common belief, women are more emotional than men – more often and more intensely experiencing emotions and their expression is richer and more readable to the environment [24]. The study also showed that the age group 31-45 years, significantly more often were accompanied by stress. The fact that an emotional approach to the problem can be justified by the lack of previous experience, the new situation that was staying in the ED, or lack of development on how to respond in difficult situations, causes the feeling of stress. On the other hand, sufficient maturity in life, fully realizing the consequences of the loss of health.

Many authors emphasize that coping with stress exponents is a continuous interaction between the individual and the situation [25,26]. This process is largely determined or created by the patient's subjective assessment of the situation, which is influenced by changes in health (clinical course of the disease, the incidence of possible complications), as well as the following changes in the consciousness of the patient in contact with the medical staff, other patients and family. The implemented study showed that feelings of stress are statistically less likely to accompany a person with primary education, which can be explained by a lower level of understanding the situation. Nor can we exclude the possibility that doctors establish better and more effective relationships with patients with a higher education. Studies by other authors show that the implementation of a doctor's duty to inform the patient is better judged by people with higher and secondary education [27,28]. Our study also showed that patients of the ED with previously diagnosed chronic diseases were statistically less likely to feel stress than others. There is a suspicion that people suffering from chronic diseases and people not-suffering from chronic diseases differ in terms of acceptance of the disease [29]. People with chronic diseases are characterized by phases regarding coping with the disease. Normally at the beginning of the disease individuals experience, disorganization of typical physical, mental and social reaction. The crisis is a state of transition if the unit finds effective methods of coping with the disease reaches an adaptive balance and adapt to the situation [30-34]. The acceptance of the disease increases with the time of its duration, and the people who suffer more have a higher rate of acceptance [35-36]. Dealing with stress accompanying the diseases is therefore the result of intricate relationships between these variables, which is also affected by certain features of the psyche of the patient, as well as other factors such as age and sex of the patient, his family situation and economic and professional status and social [37].

As shown in other studies, pain perception is influenced by gender. This is confirmed by, inter alia: Golec et al., Kostarczyk, Krzyżak-Jankowicz et al. by quoting studies that found greater resistance to pain in men. While in women, an increased emotional intensity intensifies pain localized in different parts of the body. Research conducted by Golec et al. [38] on how to cope with chronic pain has shown the critical importance of the demographic factor of gender. Women are more likely than men to exaggerate the problem.

The biggest problem to the functioning of the ED, as reported by the respondents, was the prolonged wait for medical assistance. Many a time, it is fault of the patients themselves. Instead of going to their family doctors or clinic, the come to the ED without any tests results or referrals [39]. It needs emphasizing, though, that the level of patients' satisfaction with the care provided is a very important indicator of its effectiveness. In place of the provision of medical assistance recognized and fulfilled the requirements and expectations of patients, are the main determinants of the assessment of its quality.

CONCLUSIONS

1. The vast majority of respondents while in the ED reported pain and feelings of stress.
2. The age of patients staying at the ED does not affect significantly the degree of pain sensation, neither the place of residence, education level, marital status, presence of accompanying persons or concomitant chronic disease. Women and the unemployed had statistically significantly lower incidence of reported pain.
3. Gender, age, education level, and the coexistence of chronic disease affect significantly the degree of stress among patients in the ED. The study did not show that residence, economic activity, marital status, or the companionship of other people had a statistically significant influence on the perception of stress.
4. Each patient treated at the ED should be included in holistic care, so that the pain and stress of their injuries is reduced as soon as possible. Reducing these negative factors could

have a significant impact on the further course of the disease and the patient's attitude to the treatment itself.
5. There are too many patients not eligible to be considered as "urgent" waiting at the EDs, which prolongs waiting for pain relief for other patients and threatens those who require immediate help.

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