

Stress, anxiety, depression and basic hope in family members of patients hospitalised in intensive care units – preliminary report

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Abstract

Background: The family response to intensive care unit (ICU) hospitalisation includes development of adverse psychological outcomes such as stress, anxiety or depression. These complications from exposure to critical care are termed post-intensive care syndrome-family (PICS-f). Psychological repercussions of critical illness affect the family member's ability to perform care functions after hospitalisation.

Methods: A total of 37 family members of patients hospitalised in an ICU were included. To evaluate the level stress, anxiety, depression and basic hope the standardized questionnaires the Perceived Stress Scale (PSS-10), the Hospital Anxiety and Depression Scale (HADS) and the Basic Hope Inventory (BHI-12) respectively were used.

Results: In 33 respondents (89.19%) a high level of stress was identified, and 14 (37.84%) and 12 (32.43%) respondents had severe anxiety and depression, respectively. Higher levels of stress, anxiety and depression were found in spouses and family members living with the patient. Female subjects had a higher level of basic hope ($P = 0.026$). It was found that perceived stress correlated with anxiety ($r = 0.456$, $P = 0.005$) and depression ($r = 0.481$, $P = 0.003$).

Conclusions: Most relatives of the patients reported stress, anxiety, depression and low basic hope. Preventive family-centred interventions are needed to minimize the risk of adverse psychological repercussions, including post-intensive care syndrome family.

Key words: depression, anxiety, stress, intensive care unit, basic hope, patient's family.

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Family members of patients in a critical condition who are treated in an intensive care unit (ICU) are at a high risk of developing anxiety, depression, acute stress disorder (ASD) or post-traumatic stress disorder (PTSD). This may be a result of a direct threat to a loved one's life, sudden onset and type of a disease, the patient's condition and the emotional bond between the relatives [1, 2]. While adjusting to the ICU environment, families have to deal not only with problems related to the patient's current situation, fear of death or potential disability, but also with the stress related to the functioning of the family up to this time and concerns about its future [2, 3].

Studies assessing the risk of relatives developing mental health disorders in the first few months following hospitalisation of a loved one in an ICU have been reported around the world. Up to 50% of relatives of the treated patients were diagnosed with PTSD symptoms, up to 75% with anxiety symptoms

and up to 40% with depression symptoms [4–7]. Moreover, 69% of subjects showed anxiety disorders already in the early period of the patient's stay in the ICU, while as many as 73% exhibited them on the day preceding discharge [4]. In psychological and medical jargon, one may come across a phrase describing them as "second-order patients".

In view of the above, in 2010, the Society of Critical Care Medicine, after examining the family reactions to a critical illness of a loved one, proposed a new term – post-intensive care syndrome family (PICS-f) [8, 9]. The consequences of PICS-f include physical, cognitive and psychosocial dysfunctions that can last from months to a dozen or more years, which might significantly affect everyday functioning or cause difficulties in fulfilling the role of a family caregiver [8].

Thus, it seems that the assessment of diagnostic activities related to the patient's serious condition and their impact on the emotions and reactions

of ICU patients' family members is remarkably important. As Basińska [10] notes, another intriguing question might be whether the decisions made during treatment could change if doctors knew more about the mental health condition of the treated patients and their relatives. Despite the fact that in recent years the number of such analyses has increased around the world, only a few works on this subject exist in the Polish literature. The studies initiated by Płaszewska-Żywko and Gazda [1] as well as Łopacińska [11], which assessed the emotional responses and needs of families of patients treated in ICUs, have not been continued in other centres in the country. Hence, the aim of this study was to determine the level of stress, anxiety, depression, as well as the sense of hope in family members of ICU patients.

METHODS

The Bioethics Committee of the Jan Kochanowski University approved the study and all participants gave their written consent.

The research was conducted among family members of patients treated in the Cardiac Intensive Care Unit and the Department of Anaesthesiology and Intensive Care of the Provincial Hospital in Kielce in the period between November 2019 and February 2020. The diagnostic services and treatment in the above-mentioned wards are focused on diseases of the heart, circulatory system and respiratory system. All patients were admitted urgently and were in a life and health-threatening condition.

Participation in the study was voluntary. All of the distributed questionnaires were returned to the authors. Due to the announcement of the SARS-CoV-2 pandemic and the introduction of the visit ban, the study was conducted on only 37 people.

In the conducted study, the authors used standardised measurement tools and their own demographic data questionnaire, which included single-choice questions about gender, age, education, marital status, degree of kinship, number of ICU hospitalisations in the family, day of hospitalisation and distance from the place of residence to the hospital.

The level of perceived stress was assessed using the Perceived Stress Scale (PSS-10) by S. Cohen, T. Kamarck, R. Mermelstein [12] in the Polish adaptation [13]. The PSS-10 scale is used to assess the intensity of stress related to one's own life situation over the last month. It contains 10 questions, of which six are constructed negatively (1, 2, 3, 6, 9 and 10), and four are constructed positively (4, 5, 7 and 8). Each question began with the phrase "In the last month, how often...", where 0 meant never, 1 – almost never, 2 – sometimes, 3 – quite often, 4 – very often. The score for each question ranged from 0 to

4 points. Individual scores on the PSS can range from 0 to 40 with higher scores indicating higher perceived stress. Scores in the range 0-13 would be considered low stress, scores in the range 14-26 would be considered moderate stress and scores in the range 27-40 would be considered high perceived stress. The higher the score, the higher the stress level in the family members of the ICU patients.

The level of anxiety and depression was assessed using the Hospital Anxiety and Depression Scale (HADS) designed by R.P. Snaith and A.S. Zigmond [14] in the Polish version prepared by Majkovicz, de Walden-Gałuszek and Chojnacka-Szałowska [15]. Two independent subscales, each containing seven statements, individually referred to anxiety and depression, and for each of the statements the participant could score from 0 to 3 points. According to the authors of the scale, the following standards were adopted for the analysis of symptoms: 0–7 points – no disorders, 8–10 points – borderline states, over 10 points – symptoms disorders are found. The individual maximum score for anxiety and depression was 21 points. The higher the score, the greater was the incidence of anxiety and depression symptoms.

The BHI-12 questionnaire by Trzebiński and Zięba [16] was used to assess the level of basic hope, understood as the individual's conviction about the order and meaningfulness of the world and its favourability to people. This conviction constitutes a factor determining a person's constructive response to changes and breakthrough events. According to the questionnaire, basic hope determines the individual's response to two types of situations: a) novelty – by increasing readiness to take on new challenges and build a new order; b) disintegration of the current order and irreversible loss. The questionnaire is appropriate for diagnosing the way that a person reacts to stress and trauma, as well as the speed and constructiveness of adaptation to new situations. It consists of 12 statements. The participant states the degree to which they agree with each statement, using a scale from 1 ("I strongly disagree") to 5 ("I strongly agree"). The total score is the result of one's overall level of basic hope. The maximum score on the scale is 45 points. The higher it is, the greater is the basic hope.

Statistical analysis

The analysis of quantitative variables was performed by calculating the mean, standard deviation, median, quartiles, minimum and maximum. The analysis of qualitative variables was performed by calculating the number and percentage of occurrences of each value. The comparison of the values of qualitative variables in the groups was conducted

using the chi-squared test (with Yates's correction for 2×2 tables) or in cases of low expected frequencies in the tables, Fisher's exact test. The comparison of the values of quantitative variables in two groups was performed using the Mann-Whitney test, while the values of quantitative variables in three or more groups were compared employing the Kruskal-Wallis test. After detecting statistically significant differences, post-hoc analysis with Dunn's test was conducted to identify statistically significantly different groups. Correlations between quantitative variables were analysed using the Spearman correlation coefficient. A P value < 0.05 was adopted as significant. All analyses were performed in the R program, version 4.0.2. [17].

RESULTS

Completed questionnaires were obtained from 37 family members of patients treated in the ICU, including 23 women (62.16%) and 14 men (37.84%) aged 19 to 65 (SD = 11.93%). The study group was dominated by people with secondary education ($n = 17$), 14 people had higher education ($n = 37.84\%$), and the rest had less than secondary education. 34 out of the 37 relatives of treated patients (91.81%) were married and/or in an informal partnership, while 3 respondents (8.11%) were not in a relationship. Among the patients treated in the ward, the largest group included mothers or fathers of the examined relatives ($n = 22$), followed by spouses and/or partners (27.03%), grandmothers or grandfathers (8.11%), siblings (2.70%) and other persons (2.70%). The average age of patients was 69.05 years (SD = 11.06) and ranged from 43 to 87 years. The majority (54.05%) of the respondents did not live with the patient. Considering the number of hospitalisations of the ICU patient, most respondents answered that it was the first hospitalisation (62.16%), 4 the second one (10.81%), 7 the third one (18.92%), and 2 the fourth one (5.41%). In one case, the patient was hospitalised 5 times (2.70%). The research was conducted after an average of 4.35 days of hospitalisation (SD = 4.53). This period ranged from 1 to 23 days in the ICU. Most of the surveyed relatives lived in the city of the patient's hospitalisation ($n = 17$), 7 lived within a distance of 20 km (18.92%) and the rest of the respondents lived more than 20 km away.

Among 37 relatives of the ICU patients, 33 (89.19%) had a high level of stress, 3 respondents (8.11%) had an average level of stress, and 1 (2.70%) had a low level of stress.

It was noted that the level of stress was significantly higher in people whose spouse or partner was hospitalised than in the remaining respondents (29.2 ± 3.29 ; $P = 0.009$). A higher level of stress was also reported by people living with the patient

TABLE 1. Degree of relationship and residence in relation to PSS-10

PSS-10 [points]	The person hospitalized is for me			P-value
	Parent – A ($n = 22$)	Spouse, partner – B ($n = 10$)	Other – C ($n = 5$)	
Mean \pm SD	23.64 \pm 5.63	29.20 \pm 3.29	22.40 \pm 3.91	0.009
Median	25.0	30.5	20.0	–
Quartiles	22.25–26.00	28.25–31.75	20.00–25.00	B > A, C
	Living with the patient		P-value	
	Yes ($n = 17$)	No ($n = 20$)		
Mean \pm SD	27.24 \pm 4.10	23.05 \pm 5.83	0.024	
Median	27.0	24.5	–	
Quartiles	24.00–31.00	20.00–25.25	–	

P – Kruskal-Wallis test + post-hoc analysis (Dunn test); P – Mann-Whitney test. PSS-10 – Perceived Stress Scale

(27.24 ± 4.1 ; $P = 0.024$). The above values are presented in Table 1. Gender, age, education, marital status of the surveyed relatives, number and day of hospitalisation, and age of the patient were not related to the level of stress intensity.

It was found that 14 of the surveyed relatives (37.84%) obtained a score of 10 or more, which indicates that the symptoms of anxiety were severe, 14 (37.84%) had a borderline state (i.e., the present symptoms of anxiety were higher than the standard accepted in the questionnaire), while 9 respondents (24.32%) obtained a score below 7 points, which implies an inconsiderable level of anxiety symptoms. Furthermore, when analysing the level of depression, 11 out of 37 relatives (29.73%) obtained a score below 7, 14 respondents (37.84%) exhibited a borderline status, and 12 respondents (32.43%) obtained a result of 11 or more, which indicates a high level of depressive symptoms.

It was found that the symptoms of anxiety (13.3 ± 4.3 ; $P = 0.004$) and depression (13.8 ± 3.97 ; $P = 0.001$) were more severe in people whose spouse or partner was hospitalised than in other relationships (Table 2). Statistically significant values

TABLE 2. Degree of relationship in relation to HADS

HADS	The person hospitalized is for me			P-value
	Parent – A ($n = 22$)	Spouse, partner – B ($n = 10$)	Other – C ($n = 5$)	
Anxiety				
Mean \pm SD	8.82 \pm 2.46	13.30 \pm 4.30	8.20 \pm 1.92	0.004*
Median	8.5	14.5	8.0	–
Quartiles	7.25–10.00	12.25–16.00	7–9	B > A, C
Depression				
Mean \pm SD	8.55 \pm 2.46	13.80 \pm 3.97	7.00 \pm 1.22	0.001*
Median	8	14	7	
Quartiles	7.00–10.00	13.00–16.50	7.00–8.00	B > A, C

P – Kruskal-Wallis test + post-hoc analysis (Dunn test). *Statistically significant relationship ($P < 0.05$). HADS – Hospital Anxiety and Depression Scale

TABLE 3. Living with the patient in relations to HADS

HADS	Living with the patient		P-value
	Yes (n = 17)	No (n = 20)	
Anxiety			
Mean ± SD	11.88 ± 3.46	8.30 ± 2.85	0.003*
Median	11	8	
Quartiles	9.00–15.00	6.75–10.00	
Depression			
Mean ± SD	11.94 ± 3.85	7.90 ± 2.53	0.001*
Median	11	8	
Quartiles	9.00–14.00	6.00–8.00	

P – Mann-Whitney test. *Statistically significant relationship ($P < 0.05$). HADS – Hospital Anxiety and Depression Scale

were also noted among family members living with the patient. It was established that anxiety (11.88 ± 3.46 ; $P = 0.003$) and depression (11.94 ± 3.85 ; $P = 0.001$) were significantly more intense in this group (Table 3). On the other hand, taking into account the distance between the hospital and the place of residence of the surveyed relatives, it was found that the anxiety was significantly more severe in those who lived in the same city where the hospital of the patient's stay was located than in those who lived up to 20 km from the place of hospitalisation ($P = 0.048$). The age of the patient correlates significantly ($P = 0.025$) and negatively ($r = -0.368$) with the severity of depression; therefore, the older the patient was, the lower was the severity of depressive disorders in the surveyed relative.

There was no significant relationship between depression, anxiety and gender, age, education level and marital status in the study group.

The analysis of the level of hope of the family members of patients treated in the ICU showed that 18 out of 37 relatives (48.65%) had an average level

of hope, 14 (37.84%) exhibited a low level of hope, and only 5 (13.51%) declared a high level of hope. The analysis of the individual questionnaire scores revealed that the surveyed relatives most often stated that the reality around them is inexplicable and unpredictable (4.16 ± 0.93), the important events they encounter are accidental and are at the mercy of fate (4.05 ± 0.97); however, there will always be some people who will help them in difficult moments (4.05 ± 0.88). The statement "Fate is unfavourable to me" obtained the lowest score (3.27 ± 0.96), which indicates that the surveyed relatives have the lowest sense of hope in this particular aspect. The values describing the individual items of the questionnaire are presented in Table 4.

It was noted that the level of hope was significantly higher in women ($P = 0.026$). The remaining variables, i.e. age, education, marital status, degree of kinship, living with the patient, day of hospitalisation, distance from the hospital and age of the patient, did not show statistical significance.

It was found that perceived stress correlated significantly ($P < 0.05$) and positively ($r < 0$) with anxiety ($r = 0.456$, $P = 0.005$) and depression ($r = 0.481$, $P = 0.003$); therefore, the more intense the stress, the more severe are the anxiety and depression symptoms. Conversely, the greater the severity of anxiety and depression disorders, the greater is the level of experienced stress. The above results are presented in Table 5. No significant relationships were determined between HADS and BHI-12 or between PSS-10 and BHI-12 ($P > 0.05$).

DISCUSSION

The results of the present work reveal that hospitalisation in the ICU causes severe stress reactions in family members of the treated patients. During

TABLE 4. Basic hope in family members of intensive care unit patients. Item analysis

Item	Mean	SD
People have more good childhood memories than bad	3.65	0.79
The world is equal and everyone will get what they deserve sooner or later	3.65	0.92
There is actually no objective good and bad	3.43	0.77
Most people are satisfied with their lives	3.62	0.89
Reality is inexplicable and unpredictable	4.16	0.93
The world is actually good, even when we feel bad	3.46	0.99
It is worth allowing yourself to fantasize and dream about how to achieve your most important goals	3.49	0.8
There will always be some people to help us in difficult times	4.05	0.88
Important events that happen to us are accidental and we are at the mercy of fate	4.05	0.97
Fate is unfavourable for me	3.27	0.96
The world actually makes sense, even when we feel lost at times	3.46	1.04
Which statement is nearer to your experiences: <ul style="list-style-type: none"> • There is no bad that would not turn out for good • There is no bad that would not turn out to be worse 	3.54	1.57

the stay of a close relative in the ICU, nearly 90% of relatives reported a very high level of stress and about 38% and 33% experienced high levels of anxiety and depression, respectively. This is consistent with numerous international studies, which estimated a high level of stress in family members of patients treated in the ICU from 40% to 55% [2–7, 18], anxiety from 30% to 80%, and depression from 30 to 94% [2–7, 19, 20]. Such strong reactions might increase the risk of disorders defined as ACD and PTSD. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) the symptoms that define ASD and PTSD overlap [21]. One difference, though, is that acute stress disorder refers to the initial traumatic symptoms that arise immediately after a traumatic event and PTSD refers to the long-term aftermath of trauma, and a PTSD diagnosis cannot be given until symptoms have lasted for one month. Moreover, the incidence of ACD in the relatives of patients treated in the ICU is approximately 33%. In the case of PTSD, the incidence is 30% to 42% at 3 months following the discharge from the ICU and 35% to 57% at 6 months [20, 22]. Factors related to higher stress levels are female gender, length of stay in the ICU and lower level of education [20, 23]. Nonetheless, none of these factors were confirmed in the present study. The degree of kinship (marriage) and the fact of living with the patient proved to be important. It seems that this might be strongly related to the considerable concern for the future of the family and how it will function after hospitalisation.

Intuitively, it appears that a short stay in the unit is less likely to increase the risk of severe stress symptoms as well as anxiety and depression in the relatives, compared to those families who experience a long and difficult treatment process. However, some studies emphasised that family members of patients with shorter stays (2 days) exhibited a similar frequency of anxiety and depression at discharge as in the case of longer stays [8]. In turn, others demonstrated that the intensity of nearly all of these emotions decreased on the 2nd or 3rd day of an ICU patient's stay [1, 24]. However, in this study, the day of hospitalisation was not related to the level of stress, anxiety and depression. Hence, no evidence was found that stress, anxiety and depression pass during the patient's hospitalisation. Davis-Martin's [6] considerations followed a similar direction. She noted that the family presented the above psychological complications from 3 to 5 days to even 2 weeks. These results suggest that the family's negative emotions can therefore be stable and lasting, regardless of the time spent by the patient in the ICU, taking into account even those whose relatives survived.

TABLE 5. Correlation between PSS-10 and HADS

HADS	PSS-10
	Spearman's correlation coefficient
Anxiety	$r = 0.456, P = 0.005^*$
Depression	$r = 0.481, P = 0.003^*$

*Statistically significant relationship ($P < 0.05$). PSS-10 – Perceived Stress Scale, HADS – Hospital Anxiety and Depression Scale

It seems that the number of hospitalisations as well as previous experiences and knowledge regarding the specific nature of the ICU functioning could potentially serve as factors in alleviating anxiety, depression or acute symptoms of stress experienced by family members of ICU patients. However, the present study did not confirm this relationship and is inconsistent with the data of other studies, which demonstrated that the number of hospitalisations might increase the risk of negative psychological reactions in the patients' relatives [25]. Furthermore, those who experienced a family member's readmission to hospital in the last two years might have significantly higher incidence of anxiety, depression and stress than those whose relatives have not previously been hospitalised [26]. Accordingly, it can be assumed that the stay of a patient suffering from an illness in the ICU is such a stressful event in the family's life that it cannot be included in any framework or pattern of reacting to this experience, thus subordinating and entrusting the care for the patient to doctors as professionals and people with authority.

The level of stress, anxiety and depression was considerably more intense in the spouses or partners of the ICU patients than in other relatives. This is confirmed by the research by Pochard *et al.* [4], which showed that these symptoms affected as many as 84% of the respondents. In addition, research by other authors demonstrated an almost fourfold increase in the risk of PTSD among wives and an almost threefold increase among husbands. The frequency of incidence of PTSD was not related to whether the spouse survived. However, the occurrence of depression symptoms was more likely when the patient was at risk of permanent disability [5]. It seems that the high intensity of these symptoms may be a result of anxiety about the upcoming changes in the structure and functioning of the family outside the hospital environment, and above all, a result of the concerns related to the need to adapt and subordinate to the system of further health care [24].

According to the literature, women reported a stronger feeling of negative emotions. At the time of admission of a family member to the ICU, they showed a more intense feeling of depression and nervousness than men, and on the second or third day of stay, more intense fear [1]. Also in the studies

by Paparrigopoulos [23] and Chartier *et al.* [27] women exhibited greater anxiety and depression symptoms as well as more intense and long-lasting stress reactions. In the present study, however, gender did not affect the level of perceived stress, fear and anxiety, which indicates that both men and women experienced the stay of a loved one in the ICU as difficult and stressful. Intriguingly, women reported a higher level of basic hope, which might mean that the sense of rationality and understanding of hospitalisation in the ICU is an important element in undertaking remedial strategies for coping with a disease of a loved one.

The authors of the present study assumed that the age of the patient might be significant in terms of the intensity of emotions during hospitalisation in the ICU. Indeed, it was noted that the older the patient was, the lesser were the symptoms of depression in the person visiting them. A significant link between the patient's age and symptoms of stress has also been found in studies by other authors [28, 29]. The families of older patients reported fewer symptoms of stress and anxiety. Conversely, hospitalisation and/or death of younger people put the relatives at greater risk of developing PTSD. However, the highest level of stress was recorded by those relatives who were present at the time of death of a loved one. This indicates that the younger the patient's age, the greater is the severity of stress, anxiety and depression, and the lower is the family adaptation to illness and hospitalisation in the ICU.

The ICU is also probably the only place where the relatives of patients seem to be suffering not only because of their illness, but also because of the fact that in some cases they have to become a substitute decision-maker during discussions about options for supportive or life-saving treatment. According to the literature, the level of anxiety is higher precisely among people who took part in making decisions concerning the end of life [30]. Family members involved in the decision-making process are also more likely to develop PTSD [31]. The available literature also reports that the death of a patient during ICU stay or the presence of family members at the time of their death significantly increases the level of stress, anxiety and depression and might be the reason for a greater risk of PICS-f in the future [4, 7]. This is certainly a part of this research that requires further evaluation. Due to the fact that all patients were alive during the study, the authors had no possibility to compare the levels of stress, anxiety and depression or to differentiate them in this context.

In summary, hospitalisation of a loved one in the ICU exposes the family to many difficult and unknown situations, particularly those related to

a direct threat to the life and health of a loved one. From a psychological point of view, hope may be important in this situation. It plays an adaptive role and is essential in constructing the ability to cope with difficult situations [16]. The research conducted so far reveals that in the case of various types of traumatic events, including life-threatening conditions and coping with the disease, basic hope is a good and better predictor of post-traumatic growth than optimism [32]. People with a high level of basic hope experience the process of accepting loss faster. Hence, hope is treated as an ability that shapes the behaviour of an individual in confrontation with radical life changes. Nevertheless, this study showed moderate or low levels of basic hope in the majority of the relatives. Therefore, it appears that hospitalisation of a relative in the ICU and contact with the ward's environment are such a difficult experience that they can reduce the willingness to understand and accept the situation, thus making adaptation and undertaking constructive coping strategies difficult.

Hence, provision of support to the family by medical personnel is remarkably important, as is the knowledge about the needs of the patient's relatives. Significant dimensions are also empathy, understanding of the emotions experienced by the relatives, as well as the manner of communicating information about the patient's condition and the course of the therapeutic process [1].

This study has several limitations. First of all, the small sample of 37 relatives limits the representativeness of the results and the statistical power of the obtained analysis. No trend should be extrapolated to the wider population based on such a small sample size. Consequently, the results should be interpreted with caution. Another limitation relates to the fact that the data verification was carried out in a relatively short time.

In Poland, there is very little research on stress, anxiety and depression in family members of ICU patients. There are also no studies analysing the hope level of the surveyed relatives. Moreover, a 100% response rate was achieved and no questionnaire was missing any information or contained unchecked responses.

CONCLUSIONS

Our research revealed that almost 90% of the patient's relatives reported high levels of perceived stress. The level of stress was significantly higher in people whose spouse or partner was hospitalised than in other family members. Compared to other respondents, the symptoms of anxiety and depression were more intense in people whose spouse or partner was hospitalised and in those who lived

with the patient on a daily basis. The older the patient, the lower was the severity of depressive disorders in the family member. Women had a significantly higher level of hope. The stronger the stress, the greater was the severity of anxiety and depression disorders. Accordingly, the greater the severity of anxiety and depression disorders, the greater was the stress.

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