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PTSD symptoms and coping mechanism of nurses in Poland before the COVID-19 pandemic. A cross-sectional study

Abstract

Introduction. Secondary traumatic stress (STS) is a consequence of the indirect experience of trauma. The symptoms of STS are similar to those experienced by people who directly experience traumatic events in the form of posttraumatic stress disorder (PTSD).

Aim. The aim of the study was to determine the frequency of the symptoms of PTSD and to establish the role of coping strategies in the development of PTSD symptoms among Polish nurses. The study was conducted before the COVID-19 pandemic.

Material and methods. The study was conducted in the Podkarpackie Province (Poland) in clinical hospitals and hospital outpatient clinics. The results of studies conducted among 509 nurses were analyzed. The mean age of the respondents was 35 years, and the mean work seniority was 11 years. The IES-R scale and Mini-COPE were used in the study.

Results. At least moderate PTSD symptoms were found in 42.4% of the surveyed nurses. The results showed that maladaptive stress coping strategies played a major role in the development of PTSD symptoms in the group of nurses.

Conclusion. Nurses are a professional group exposed to a high risk of traumatic encounters that may result in PTSD/STS, therefore this professional group should be targeted at prophylactic programs and training in dealing with traumatic stress. The COVID pandemic and the related restrictions, organizational chaos, constant fear and a sense of danger are serious traumatizing factors and can seriously contribute to the increase in stress disorders among nurses and other medical professionals.

Keywords: posttraumatic stress disorder (PTSD), secondary traumatic stress (STS), nurse, coping, COVID-19, pandemic.

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INTRODUCTION

Nursing profession is undoubtedly associated with a high level of occupational stress and an increased risk of burnout. Another negative consequence of stress experienced at work is the so-called secondary traumatic stress (STS; STSD – secondary traumatic stress disorder). This term refers to a set of symptoms occurring in those who have had contact with people who have directly experienced trauma or suffering. The symptoms of STS are similar to those experienced by people who directly experience traumatic events, in the form of posttraumatic stress disorder (PTSD). They include, first of all, intrusive persistent thoughts related to the event (intrusion), avoidance of stimuli related to trauma and symptoms of increased psychophysiological hyperarousal manifested by difficulty falling asleep, outbursts of anger, or increased alertness. STS can be detrimental not only to the mental and physical health of medical personnel, but also negatively affect the efficiency and quality of patient care [1,2].

AIM

The aim of the study was to determine the frequency of the symptoms of post-traumatic stress disorder and to determine the role of coping strategies in the development of PTSD symptoms among Polish nurses. The study began when the first cases of infection with SARS-COV2 virus appeared in Europe. At that time, the medical staff in Poland was not aware of the threat that they would face soon after. Since then, medical staff, including nurses, experienced unprecedented levels of workload and pressure [3]. The COVID-19 pandemic is an extraordinary and unpredictable situation for Polish nurses, highly stressful, requiring even greater involvement of resources and coping strategies than usual. The Polish health care system was not sufficiently prepared for the pandemic, shortage of procedures, systemic and organizational solutions, necessary specialist equipment, even personal protection equipment was observed. The change of the current organization and working conditions was a highly stressful factor for nurses and other medical personnel. In addition, fear of an unknown pathogen, lack of knowledge about transmission of infection, fear for the health of oneself and the loved ones, as well as misunderstanding

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on the part of patients and intensification of aggressive behaviour towards medical personnel were observed. Nurses had to deal with a very serious, highly traumatizing situation, which, according to the authors, may increase the likelihood of negative psychological consequences, including PTSD or the burnout syndrome, to which, generally, these professionals are already vulnerable [4].

MATERIAL AND METHODS

Participants

The survey included professionally active nurses working in randomly selected hospital wards and outpatient clinics in clinical hospitals in the Podkarpackie Province. The inclusion criteria was a minimum of 4 weeks of work experience. The study was conducted in January and February 2020. Initially, 600 questionnaires were distributed. Finally, 509 correctly completed questionnaires were qualified for the study. The number of 91 questionnaires was rejected due to an incorrectly completed ones, missing answers in the questionnaire or withdrawing consent to participate in the study. The allocation to the group is presented in the Flow Chart diagram (Figure 1).

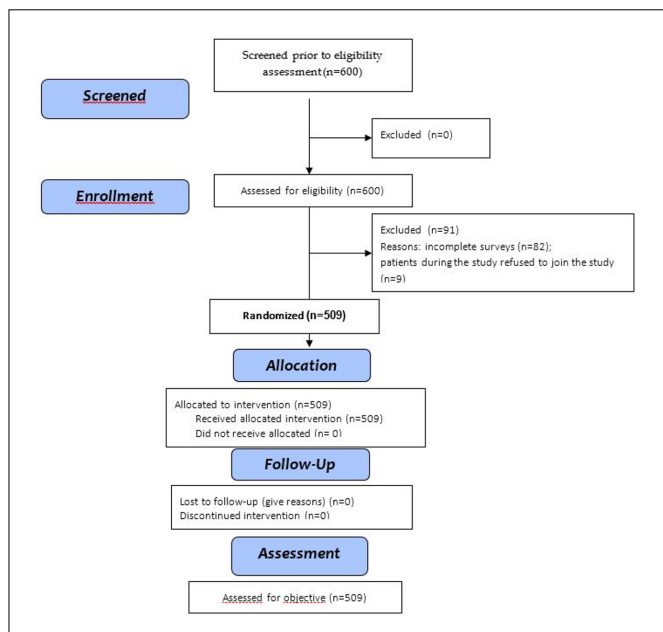


FIGURE 1. Flow Chart diagram.

The survey was anonymous. The respondents were informed about the purpose of the study and the possibility of withdrawing from participation at any time. Correct completing the questionnaire and returning it to the investigator was tantamount to consenting to participate in the study. The mean time of completing the questionnaire was approx. 15 minutes.

A calculator was used to calculate the minimum (required) number of people in the sample. The sample size for the finite population is: 384 (maximum error 5%, significance level (α) 0.05). The size of the population was estimated based on the data of the Supreme Chamber of Nurses and Midwives, as of December 31, 2019 on 257.833 employed nurses and midwives [5].

Methods

The study used The Impact of Event Scale-Revised (IES-R) and the Inventory of Coping Orientation to Problems Experienced (Mini-COPE). A socio-demographic questionnaire was also

used, containing questions about socio-demographic data (gender, age, marital status, the fact of having children, education, work seniority and place of work).

The Impact of Event Scale (IES), developed by Weiss and Marmar, consists of 22 statements that describe various experiences related to a traumatic event. The intensity and frequency of experiences and symptoms were defined on a scale from 0 (not present at all) to 4 (definitely present). The scale takes into account three dimensions of PTSD: intrusion, hyperarousal and avoidance. The Polish version of the scale has satisfactory psychometric parameters – Cronbach's alpha index for the entire scale is 0.92 [6].

The Mini-COPE Inventory is an abbreviated version of the Multidimensional Coping Inventory – COPE. The questionnaire consists of 28 statements included in 14 strategies of coping with stress, including: active coping, planning, positive re-evaluation, acceptance, sense of humor, turning to religion, seeking emotional support, seeking instrumental support, self-distraction, denial, venting, substance use, behavioural disengagement and self-blame. A subject responds to each statement on a scale from 0 (I almost never do so) to 3 (I almost always do so). Each of the 14 coping strategies is assessed separately. The higher the score, the more often the subject uses the given strategy. The obtained parameters are satisfactory, the half-time reliability for 14 scales is 0.86 [7].

Ethics statement

The study was approved by the institutional Bioethics Committee (Resolution No. 6/04/2012) and by all appropriate administrative bodies. The study was conducted in accordance with ethical standards laid down in the Declaration of Helsinki and in Polish national regulations. The study was conducted according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) criteria (Supplementary material 1).

Statistical methods

The collected research material was statistically elaborated using the IBM SPSS Statistics (v.25) statistical package.

Quantitative variables are described by means of the mean, standard deviation, median, upper and lower quartile as well as minimum and maximum values. In the case of qualitative variables, the number and percentage of the indicated categories were given. Appropriate statistical procedures were used to verify the hypotheses. The normality of the data distributions was checked using the Shapiro-Wilk test. Two groups were compared with the Mann-Whitney U test also referred to as the Wilcoxon-Mann-Whitney test. Kruskal-Wallis one-way analysis of variance by ranks was used to compare more than two independent groups. Pearson product-moment correlation coefficient or Spearman's rank-order correlation coefficient were used to determine the correlation between the variables. The obtained results of the analysis were considered statistically significant at the level of $p < 0.05$.

RESULTS

The study enrolled 509 nurses (493 female and 16 man), aged from 22 to 59 (average age 35), with work seniority from half a year to 40 years (average work seniority 11 years).

Most of the surveyed nurses graduated from post-secondary medical school (56.8%), 26.3% completed higher education at BSc level (36%), and 16.9% graduated from MSc studies.

More than half of the nurses were married at the time of participation in the study (58.9%). One-third of the respondents were single persons. Half of the respondents had children (50.1%).

The study was conducted among nurses working at the intensive care unit (18.5%), cardiac surgery (13.2%), psychiatry (6.9%), internal diseases (8.4%), paediatrics and hospital emergency department (9, 6%) and among nurses employed in hospital outpatient clinics for adults (29.1%) and children (14.3%). For statistical purposes, at a later stage of the analysis, the respondents were divided into two groups according to the place of employment: hospital departments (56.6%) and hospital outpatient clinics (43.4%). Table 1 shows socio-demographic characteristics of the 509 participants.

TABLE 1. Characteristics of nurses (N=509)

Characteristics	Count	%
Age, years	34,65 mean (10,18) SD	
Gender		
Male	493	96.9
Female	16	3.1
Place of residence		
City	297	58.3
Village	212	41.7
Marital status		
Married	300	58.9
Single	181	35.6
Divorced	13	2.6
Widowed	15	2.9
Having children		
Yes	255	50.1
No	254	49.9
Education		
Post-secondary school	289	56.8
Bachelor's degree	134	26.3
Master's degree	86	16.9
Average professional seniority in yrs	11,24 mean (10,44) SD	
Workplace		
Hospital departments	288	56.6
ICU	94	18.5
Cardiac surgery	67	13.2
Psychiatry	18	3.6
Internal diseases	43	8.4
Paediatrics	17	3.3
Emergency department	49	9.6
Hospital outpatient clinics	221	43.4
Adults	148	29.1
Children	73	14.3

One-fourth of the surveyed nurses declared that they had experienced one traumatic event (36.5%) connected with their professional work. Half of them declared that there were several or a dozen such events (50.3%). The remaining 21.2% of the respondents claimed that there was no such event in their professional work.

The subjects were asked for an answer on factors related to traumatic events (a multiple choice question). The most common factors related to traumatic events mentioned by the respondents were: patient's death, cardiopulmonary resuscitation and the threat to life or health of other people.

Assessment of the intensity of PTSD symptoms in the group of surveyed nurses

At first, the distribution of numerical values of the measures determined on the basis of the questionnaire was determined using selected descriptive statistics for this purpose. On the basis of numerical measures, people with at least moderate

form of a given behaviour were identified – in accordance with the recommendations from the literature - the numerical value exceeded 1.5 points in them [6]. The number and percentage share of these people in the entire group were given. Then, the results of the comparative analysis of the IES-R questionnaire data were presented depending on the selected sociodemographic variables.

The mean score for the PTSD scale in the professional group of nurses was 1.33.

A similar intensity of the results in each of three dimensions of the scale makes the diagnosis more reliable (Table 2).

TABLE 2. Means and standard deviations of the IES-R results in the study group PTSD

PTSD	N	M	SD	Min	Max	Q1	Me	Q3
Intrusion	509	1.34	1.05	0.00	3.88	0.25	1.25	2.13
Hyperarousal	509	1.29	1.03	0.00	3.86	0.21	1.29	2.00
Avoidance	509	1.36	1.02	0.00	3.86	0.29	1.43	2.14
Global score	509	1.33	0.99	0.00	3.82	0.39	1.36	2.09

M-mean, SD – standard deviation, Min – minimum value, Max – maximum value, Q1 – lower quartile, Me –Median, Q3 – upper quartile

When assessing the results of the IES-R scale, it is advisable to adopt a cut-off value from which the results of the examined person can be considered indicative of the presence of PTSD. The authors of the IES-R scale assumed the average score of 1.5 for the general scale index as the borderline value, the result above this point can be indicative of PTSD. The value of 1.5 points for the overall PTSD scale was exceeded in every third person, i.e. moderate or high intensity of PTSD symptoms was found in 42.4% of the surveyed nurses. On the basis of the point values of the measures calculated from the PTSD questionnaire, people with at least a moderate level of individual symptoms were distinguished: over 42.8% of the respondents were characterized by avoidance, 40.3% by intrusion, and 38.7% by hyperarousal (Table 3).

TABLE 3. PTSD symptoms intensity in the study group

PTSD	Low symptoms severity		Moderate to high symptoms severity	
	N	%	N	%
Intrusion	304	59.7	205	40.3
Hyperarousal	312	61.3	197	38.7
Avoidance	291	57.2	218	42.8
Global score	293	57.6	216	42.4

The assessment of the influence of such socio-demographic factors such as gender, place of residence, marital status, did not show any relationship between the above-mentioned variables and the intensity of PTSD symptoms. However, a statistically significant relationship between the fact of having children and the severity of PTSD symptoms was observed – people who have children show a higher level of PTSD symptoms severity ($p < 0.001$). A relationship was also found in the case of the level of education – people with higher education have a higher intensity of PTSD symptoms than people with post-secondary education ($p < 0.1$). There was also a correlation between age, work seniority and the overall PTSD score in the study group ($p < 0.001$).

Taking into account the work place of the surveyed nurses, a statistically significant difference was found in the intensity of PTSD symptoms between nurses working in hospital departments and those employed in outpatient clinics. In the group of hospital ward nurses, higher level of PTSD symptoms severity was found, both in the overall score ($p < 0.05$) and in its individual dimensions (Table 4).

TABLE 4. Means and standard deviations of the IES-R results in the study group depending on the place of employment

PTSD	hospital wards			outpatient clinics			Statistics	
	M	Me	SD	M	Me	SD	Z	p
Intrusion	1.38	1.50	1.02	1.27	1.13	1.08	-1.387	0.045
Hyperarousal	1.32	1.29	1.01	1.25	1.14	1.06	-1.034	0.029
Avoidance	1.42	1.57	0.98	1.28	1.29	1.06	-1.505	0.031
Global score	1.38	1.48	0.96	1.27	1.23	1.03	-1.301	0.044

The respondents prefer positive ways of coping with stress, i.e. active coping, planning, acceptance and seeking instrumental and emotional support. They use avoidance strategies less often, e.g. denial, venting, behavioural disengagement. The least common are the strategies of coping with stress based on substance use and sense of humour.

Assessment of the impact of the stress coping strategies used on the occurrence of PTSD symptoms in the study group

All stress coping strategies used by nurses, except for the one based on a sense of humour, correlate positively with the occurrence of PTSD symptoms. The higher the intensity of symptoms, the greater the preference for using selected methods of coping with stress. A higher severity of PTSD occurs in people who, in a difficult situation, use the strategies of denial, behavioural disengagement or self-distraction i.e. maladaptive ways of coping with stress. This dependence may indicate the ineffectiveness of these strategies in the process of dealing with trauma. Of the adaptive strategies of coping with stress, positive reframing correlates most strongly with the severity of PTSD symptoms (Table 5).

TABLE 5. Correlation coefficients between coping strategies and posttraumatic stress disorder

MINI-COPE	PTSD							
	Intrusion		Hyperarousal		Avoidance		Total	
	r	p	r	p	r	p	r	p
Active coping	0.127	0.004	0.126	0.004	0.166	<0.001	0.145	0.001
Planning	0.134	0.002	0.166	<0.001	0.180	<0.001	0.166	<0.001
Positive reframing	0.184	<0.001	0.229	<0.001	0.275	<0.001	0.237	<0.001
Acceptance	0.169	<0.001	0.170	<0.001	0.198	<0.001	0.186	<0.001
Sense of humor	0.081	0.066	0.078	0.079	0.079	0.074	0.083	0.061
Turning to religion	0.120	0.007	0.169	<0.001	0.157	<0.001	0.153	0.001
Seeking of emotional support	0.084	0.059	0.105	0.017	0.134	0.002	0.111	0.012
Seeking of instrumental support	0.060	0.178	0.099	0.025	0.122	0.006	0.096	0.031
Self-distraction	0.239	<0.001	0.224	<0.001	0.264	<0.001	0.252	<0.001
Denial	0.259	<0.001	0.271	<0.001	0.265	<0.001	0.276	<0.001
Venting	0.180	<0.001	0.203	<0.001	0.217	<0.001	0.208	<0.001
Substance use	0.151	0.001	0.157	<0.001	0.121	0.006	0.149	0.001
Behavioral disengagement	0.236	<0.001	0.223	<0.001	0.201	<0.001	0.230	<0.001
Self-blame	0.212	<0.001	0.213	<0.001	0.190	<0.001	0.214	<0.001

DISCUSSION

The discussed cross-sectional study showed that nurses in Poland are exposed to a high risk of developing posttraumatic disorders in the form of PTSD. PTSD symptoms were found to be at least moderate in 42.4% of the surveyed nurses. The conducted research has shown that the severity of PTSD symptoms is positively correlated with the strategies of denial, self-distraction and behavioural disengagement. This means that when faced with stress, the more often nurses take steps to avoid a stressful situation, deny it, deal with something else to avoid thinking about the stressful event or give up and discontinue action, the greater the likelihood of symptoms of post-traumatic stress disorder.

Nurses around the world are a professional group highly exposed to the symptoms of post-traumatic stress disorder, secondary trauma disorder and compassion fatigue, as already demonstrated by the results of studies and meta-analyses conducted before the COVID-19 pandemics. Due to the COVID-19 pandemic, the risk of post-traumatic stress disorder and other stress disorders is predicted to increase [4]. First reports from China [3,8,9], Singapore [10,11], Italy [12] and the USA [13] are alarming that both in the general population and in the group of medical staff there has been an increase in e.g. levels of depression, anxiety, general stress, and high levels of PTSD symptoms.

The problem of stress, both occupational and traumatic, and its negative consequences concern nurses working in all hospital wards, including specialist and primary health care [14]. A high level of secondary post-traumatic stress in nurses of emergency departments, oncology, paediatric and hospice nurses was noted i.e. in a meta-analysis by Beck [15]. A study of psychiatric nurses in Iran found that they experienced moderate PTSD symptoms [16]. According to Jacobowitz, most studies define the prevalence of PTSD in the population of psychiatric nurses at the level of 9-10% [17]. In a study by Beck and Gable, 35% of nurses who worked in maternity units

showed moderate to high levels of secondary post-traumatic stress [18]. According to Kellogg, secondary post-traumatic stress disorder affected more than half of the nurses surveyed. Paediatric nurses, who most commonly used coping with stress related to emotional and instrumental support, showed higher scores in terms of secondary post-traumatic stress. The denial and behavioural disengagement strategies were also associated with higher levels of PTSD symptoms [19].

Intensive care nurses are a group particularly exposed to PTSD/STS. Working in these departments is especially physically and emotionally demanding. The results of many studies conducted indicate that intensive care nurses are at an increased risk of developing PTSD compared to nurses with other specialties [20]. In the group of 175 ICU nurses studied by Beck et al., as many as 49% of nurses showed moderate to severe secondary post-traumatic

stress [16]. When it comes to 20.1% of Spanish ICU staff, they experienced symptoms of PTSD. There were no differences in PTSD results between ICU staff and staff in other paediatric wards. Higher rates of burnout and PTSD developed after the child died and/or conflicts with patients/families or colleagues. About 30% of the variance in PTSD is predicted by frequent use of the emotion-focused coping style and infrequent use of the problem-focused coping style [21]. Mealer also indicated high exposure of intensive care nurses to PTSD, and nurses with a master's degree in nursing were 18% more likely to develop PTSD than those with a bachelor's degree [22].

Another group that is particularly at risk of developing PTSD symptoms are emergency department nurses [23]. In a study conducted among Irish emergency department nurses, 67% met the criteria for secondary post-traumatic stress disorder [24]. Morrison and Joy found that 75% of selected emergency nurses in Scotland reported at least one PTSD symptom in the past week. Participants found that the factors contributing to this were acute occupational stressors such as CPR and death. Strategies such as positive reframing and social support have been mentioned as beneficial tools for managing secondary post-traumatic stress. However, barriers such as time and experience have been found to hinder their widespread use [25].

The results of the studies and meta-analyses presented in the literature on the relationship between the applied coping strategies and the severity of PTSD symptoms in the group of health care workers are ambiguous [26]. The results of the study conducted among Polish paramedics showed that people with high intensity of PTSD symptoms significantly more often used avoidance strategies of coping with stress [27]. The results of other studies conducted in a group of medical personnel confirm that people who use maladaptive coping strategies have greater difficulties in processing information related to trauma, which may aggravate PTSD symptoms [26].

The conducted research is associated with certain limitations. This mainly concerns the cross-sectional nature of the research. The studies did not analyze whether the studied nurses had experienced any traumatic events, including those of a personal nature. According to the literature data, such events may have an impact on the level of negative effects resulting from experienced stress at work. Due to the multifactorial conditions of the PTSD phenomenon, more extensive research would be advisable, taking into account the simultaneous influence of both external and subjective factors. The study did not include post-traumatic growth (PTG), i.e. positive changes in connection with trauma [28]. This creates opportunities for the preparation of new research projects.

Regardless of the formulated limitations, the obtained results bring new content in terms of the negative consequences of experienced stress in the group of nurses. Moreover, they can be useful for practitioners, especially those working in crisis intervention. The discussed study, conducted before the COVID-19 pandemic, showed that Polish nurses are a professional group particularly exposed to the development of PTSD. Representatives of other medical professions are also at risk, including paramedics [27,29].

The current situation of COVID-19 pandemics suggests that the severity of PTSD symptoms among health care workers in Poland will increase. Polish nurses, like doctors, paramedics and other medical workers who struggle with the Coronavirus disease, do not have sufficient prevention of stress and stress disorders. Also in the pre-COVID-19 pandemic days,

training of coping with stress and work-related stress management skills for healthcare professionals were a rare practice. Although the content related to coping with stress, stress disorders and burnout is implemented in the education of medical students, there is no obligatory stress disorder prevention program for medical personnel, which is the same nationwide. Such a program should include education on the etiology and symptoms of stress disorders, mindfulness-based stress reduction, strengthening mental resilience, training in developing emotional intelligence and coping with stress, as well as early detection of people at risk of developing stress disorders. Screening for adverse psychological outcomes and developing corresponding preventive measures would be beneficial in decreasing negative psychological outcomes. The availability of psychological help and the possibility of contacting a psychologist are also necessary. The recommendations published by the World Health Organization (WHO, 2020) include a section dedicated exclusively to healthcare professionals with suggestions for reducing the mental health impact of the pandemic. The WHO also draws attention to the problem of social isolation and quarantine as a factor that may aggravate negative stress symptoms also in the group of medical workers. However, these recommendations are general in nature and the role of individual states is to develop appropriate conditions for their implementation. In the field of psychological assistance for medical personnel in Poland, an Internet program for counteracting stress among medical personnel in difficult and crisis conditions (Med-Stres SOS) was launched at the Faculty of Psychology at the University of Social Sciences and Humanities. The authors of this program hope that its form will help overcome the resistance to participate in such programs and the use of psychological assistance among healthcare professionals.

Due to the high exposure of medical personnel to the development of stress disorders, we appeal to the Ministry of Health, decision makers of the health care system, trade unions of health care workers in Poland and other interested entities to create and immediately implement a national stress disorder prevention program for medical personnel and to provide psychological assistance for medical personnel of all specializations, taking into account the specifics of work and the degree of exposure. Regular screening of healthcare professionals for the severity of stress, depression and anxiety and other mental health disorders is also essential. It is important to maintain the mental health of medical staff to help control the epidemic of COVID-19. Multidisciplinary support is needed, including systemic, organizational, educational, psychological for healthcare workers in such a difficult and highly stressful time. In the light of the publicly available knowledge in the field of the etiology of stress disorders, although not everyone confronted with trauma will reveal psychiatric post-traumatic symptoms and will need psychological help and support from others, they will often cope on their own, using their own resources for coping with difficult situations [6]. However, psychological skills training should be strengthened to better regulate the psychological status of medical staff as well as to mitigate the psychological problems of patients. Targeted psychological interventions to promote the mental health of medical staff need to be immediately implemented. This will allow the personnel to better prepare for the confrontation with a strong traumatic stressor and reduce the risk of a clinical diagnosis of PTSD and other mental disorders.

Research on the impact of the SARS-COV2 virus pandemic on the mental state of Polish nurses is underway, but it is too early to report the results because the situation in Poland is very dynamic and the increase in new cases is still high. Future studies will also look at other healthcare professionals and emergency services who are helping to contain the coronavirus pandemic.

CONCLUSIONS

The obtained research results allow to formulate the following conclusions.

1. Polish nurses strongly experience the negative consequences of stress at work in the form of secondary traumatic stress. The severity of PTSD symptoms is very high in this professional group and will increase in the near future as a result of the COVID-19 pandemic.
2. Nurses should obligatorily participate in preventive programs, trainings, training in coping with stress and traumatic situations, also in connection with the COVID-19 pandemic.
3. Shaping the ability to cope with stress at work and developing personal and social resources is particularly important and may contribute to reducing the negative consequences of stress at work.

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Conflict of interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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