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Fear of COVID-19, Risk Perception and Stress Level in Polish Nurses During COVID-19 Outbreak

Strach przed COVID-19, percepcja ryzyka i zagrożenia a poziom stresu u polskich pielęgniarek w czasie pandemii COVID-19

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Abstract

Introduction. The outbreak of COVID-19 disease causes severe stress in health care workers, especially nurses. Nurses are at high risk of contracting the disease, as well as an increased risk of developing mental health symptoms such as fear, anxiety and work-related stress.
Aim. The aim of the study was to determine the relationship between fear of COVID-19, risk perception, perceived threat and stress in Polish nurses during COVID-19 outbreak.
Material and Methods. 106 nurses participated in the study. Perceived Stress Scale (PSS-10), Fear of COVID-19 Scale (FOC-6), Risk of Contracting COVID-19 Scale and Perceived Threat of COVID-19 Scale were used in the study.
Results. It has been shown that perceived stress, fear of COVID-19, perceived risk and threat are at high level. All the variables related to the perception of COVID-19 threat were significantly correlated with the perceived stress. The strongest relationship was between the risk of infection and perceived stress. Risk perception was statistically significant predictor of perceived stress.
Conclusions. Polish nurses experience severe stress and perceive COVID-19 as a significant threat for their health and safety. In addition to protecting medical personnel from infection, nurses experiencing the highest levels of stress should be given psychological care and support, which could prevent the negative impact of the COVID-19 pandemic on their mental health. **(JNNN 2021;10(1):3–9)**
Key Words: COVID-19, fear of COVID-19, perceived stress, perceived threat, risk perception

Streszczenie

Wstęp. Pandemia COVID-19 powoduje silny stres u pracowników ochrony zdrowia, zwłaszcza u pielęgniarek. Pielęgniarki są w grupie osób szczególnie narażonych na zarażenie wirusem. Są również narażone na odczuwanie psychologicznych negatywnych skutków pandemii, takich jak strach, lęk i stres związany z pracą.
Cel. Celem badań było określenie związku między strachem przed COVID-19, postrzeganiem ryzyka i zagrożenia a stresem u polskich pielęgniarek podczas pandemii COVID-19.
Materiał i metody. W badaniu wzięło udział 106 pielęgniarek. W badaniu wykorzystano Skalę Odczuwanego Stresu (PSS-10), Skalę Strachu przed COVID-19 (FOC-6), Skalę Postrzeganego Ryzyka Zachorowania na COVID-19 oraz Skalę Postrzeganego Zagrożenia COVID-19.
Wyniki. Wykazano, że postrzegany przez pielęgniarki stres i strach przed COVID-19, postrzegane ryzyko i zagrożenie są na wysokim poziomie. Wszystkie zmienne związane z postrzeganiem zagrożenia związanego z COVID-19 były istotnie statystycznie skorelowane z odczuwanym stresem. Najsilniejszy związek występował między postrzeganym ryzykiem a odczuwanym stresem. Postrzeganie ryzyka było statystycznie istotnym predyktorem odczuwanego stresu.
Wnioski. Pielęgniarki doświadczają silnego stresu i postrzegają COVID-19 jako istotne zagrożenie dla ich zdrowia i bezpieczeństwa. Oprócz zabezpieczania pracowników ochrony zdrowia przed zakażeniem należałoby pielęgniarkom doświadczającym najwyższego poziomu stresu zapewnić pomoc psychologiczną i wsparcie, co mogłoby zapobiec negatywnemu wpływowi pandemii COVID-19 na ich zdrowie psychiczne. **(PNN 2021;10(1):3–9)**
Słowa kluczowe: COVID-19, strach przed COVID-19, stres, postrzeganie zagrożenia, postrzeganie ryzyka

Introduction

For about a year, the entire world has been struggling with one of the greatest threats to public health in the twenty-first century. This threat was caused by the SARS-CoV-2 coronavirus pandemic, which causes the COVID-19 disease. The clinical course of the disease varies from mild or even asymptomatic to severe respiratory failure and death [1]. COVID-19 is severe in about 20% of patients and the mortality rate is approximately 2.5% [2]. The prognosis is worse in the elderly and in patients with comorbidities. Since the beginning of 2020, the disease has spread from China to the whole world, and Europe, including Poland, has become important point on the infection map. According to WHO [2], more than 79 million people in the world have been infected and 1.7 million have died. The first case of COVID-19 in Poland was recorded on March 4, and by December 31, almost 1.3 million people had been infected, and more than 28.5 thousand had died. Of the confirmed cases worldwide, 6% were in health care workers [3].

The outbreak of contagious disease causes severe stress in society, with health care professionals being one of the most affected groups. Health care workers have been on the front lines in the fight against COVID-19, working with increased workloads in terms of working hours and patient numbers, and putting themselves at the highest risk of infection [4]. From the beginning of the pandemic several hundred thousand health care workers around the world have been infected with COVID-19 and many of them have died. The number of infected medical workers is unique in modern history. In such a dramatic condition, health care workers are facing a high risk of contracting the disease, as well as an increased risk of developing mental health symptoms such as stress, anxiety and depression [5,6]. The risk of infection, endangering their own and their relatives' lives, and working in excessive dignities may lead to severe stress, the consequences of which may be both immediate and long-term [4]. This has already been proven during previous SARS and Ebola pandemics [7,8]. Previous studies have shown that SARS causes far more stress for nurses than for doctors [9]. Because nurses are the closest to COVID-19 patients, they are particularly susceptible to infection and spread virus among friends and family members.

Increased levels of nurses stress may be a result of fear of COVID-19 as well as perceived threat and risk perception. Outbreaks of contagious diseases such as COVID-19 lead to fear, which can be defined as a state of uneasiness or apprehension that results from the anticipation of a real or perceived threatening event or situation. Fear during the current pandemic is common among health care professionals who are directly involved in the care of COVID-19 patients. Moreover, due to the direct contact with COVID-19 patients, health care professionals are more likely to experience traumatic events such as patients' suffering and deaths, which may further exacerbate their fears [3]. During previous global pandemics, like SARS, MERS and H1N1 flu the relationship between pandemic fear and stress has been shown [10–12].

In addition to the fear of COVID-19, the risk perception and perceived threat are also associated with the increase in stress level in nurses. Risk perception is the perception of personal vulnerability or the likelihood of getting infected and being at risk of health. Perception of risk is most often associated with perception of disease severity and perception of threat [13]. The perceived threat is the person's assessment of how harmful the consequences of the threat would be to the valued objects, if the threat actually occurred. For example a judgment that COVID-19 infection would harm valuable objects like personal health or the health of the loved ones. Research indicated that the perceived risk was negatively associated with well-being during contagious disease outbreaks [4].

Despite the fact that the COVID-19 pandemic started at the beginning of this year, there are already some studies of its effects on the mental health of health care workers. These results show that doctors, nurses, and other staff began to exhibit moderate to severe stress and psychological problems [6,14,15]. Research conducted among Chinese public revealed that the perceived threat was associated with increased level of negative emotions. It has been shown that the perceived threat of COVID-19 can negatively impact mental health outcomes [4,5]. It has also been found that fear of COVID-19 may increase the level of stress [16]. During a pandemic, people fear for their own health and life. They are afraid of infection, death and complications [17].

Distress felt by health care professionals is mainly related to the risk perception, countless deaths, perceived uncontrolled emergency situations, long job shifts, and working directly with COVID-19 patients. Since there is a large literature showing the dramatic psychological impact of previous epidemics (i.e. the SARS outbreak) [18] and literature indicating the psychological burden of health-care workers, especially nurses, more research is needed to analyze the factors that are associated with stress of the front lines nurses exposed to COVID-19. Therefore, the aim of the current research was to analyze the relationship between the fear of COVID-19, risk perception, perceived threat and stress experienced by Polish nurses. Based on the data from the available research, we can predict that:

H1: The fear of COVID-19, risk perception and perceived threat positively correlate with the perceived stress during a pandemic.

H2: Socio-demographic and occupational hygiene factors influence the perceived stress during a pandemic.

Material and Methods

Characteristics of the Study Group

106 nurses participated in the study. The group of respondents was dominated by women (N_{women}=104; N_{men}=2). Majority of research participants was in the age range from 41 to 50 (N=35), came from small towns (N=50) and worked in hospitals in departments other than infectious diseases ward (N=57). Most of them have completed higher education (N=61). Large number of the respondents declared the fear of being infected while performing professional activities (N=101), and also of infecting their family (N=104). Most respondents assessed the availability of personal protective equipment as moderate (N=48), but it is worth notice, that the second most numerous group was the group considering the availability of them as bad (N=33). Characteristics of the study group is shown in Table 1.

Table 1. Characteristics of the study group

Variable	N	%
1	2	3
Gender		
Women	104	98.11
Men	2	1.89
Age		
30 and below	18	16.98
31–40 years	28	26.42
41–50 years	35	33.02
51–60 years	22	20.75
60 years and more	3	2.83
Place of residence		
Village	31	29.25
Small city	50	47.17
Provincial city	25	23.58
Workplace		
Hospital — other ward	57	53.77
Health center	28	26.42
Hospital — infectious diseases ward	7	6.60
Hospice	6	5.66
E.R.	5	4.72
O.R.	2	1.89
Dialysis center	1	0.94
Education		
Higher	65	61.32
Secondary	41	38.68
Fear of being infected while performing professional activities		
Yes	101	95.28
No	5	4.72
Availability of personal protective equipment		
Very poor	5	4.72
Poor	33	31.13
Mediocre	48	45.28
Good	16	15.09
Very good	4	3.77

Research Methods

Four questionnaires were used in this study. The perceived level of stress was measured with the Perceived Stress Scale (PSS-10) [19]. It is a 10-item questionnaire with 0–4 answer scale (0 — "never"; 4 — "very often"). It showed good psychometric properties in the current study (Cronbach's α=.82).

Fear of the coronavirus was measured with Fear of COVID-19 Scale (FOC-6) [20] — 6-item questionnaire with 1 (strongly disagree) to 5 (strongly agree) scale The sample items are: "I'm afraid of losing my life due to coronavirus infection" and "I am afraid of serious health complications due to coronavirus infection". They represent emotional reactions of fear caused by the coronavirus pandemic. It presented good psychometric properties (Cronbach's α=.855).

Risk perception was measured by the Risk of Contracting COVID-19 scale [4]. The scale comprises 11 items rated from 1 (strongly disagree) to 5 (strongly agree). The sample items are: "Getting infected with coronavirus threatens my health" and "I am worried that I may become infected with coronavirus". A high score reflects a stronger perceived probability of contracting coronavirus. It had good reliability in the current study (Cronbach's α=.91).

Perceived threat was measured by the Perceived Threat of COVID-19 scale [4], which includes 7 items rated from 1 (strongly disagree) to 5 (strongly agree). The scale measures perceived threat severity of coronavirus that pertains to the negative personal, societal, and economic consequences of the pandemic. The sample items include: "Coronavirus is a serious threat to people" and "The coronavirus pandemic has a damaging impact

on the economic situation of our country". The Cronbach's α reliability for the sample was 0.70.

Procedure

The study was conducted at the beginning of the COVID-19 pandemic in Poland. It was attended by nurses from Provincial Specialist Hospital in Częstochowa and Hospice Care in Częstochowa. Due to the epidemiological threat, the surveyed nurses received a questionnaire in an electronic form. They were informed about the anonymity of the study and that they could stop filling the survey at any time and without giving any reason. All nurses gave their informed consent to participate in this study. Presented study was in accordance with the guidelines of the Bioethics Committee of the University of Opole.

Results

The mean scores of used scales were: perceived stress (M=26.264); fear of COVID (M=24.443); risk perception (M=32.198) and risk of infection (M=50.075). In order to verify the relationships between the various indicators of the psychological response to a pandemic situation (risk perception, fear of COVID and perceived threat) and selected sociodemographic and occupational hygiene factors to perceived stress, it was decided to first perform Pearson's r correlation analysis for variables expressed on numerical scales to check the potential linear relations between them. As it turned out, all the variables related to the perception of the dangers associated with the coronavirus pandemic were statistically significantly correlated with the perceived stress. The strongest relationship was between the risk of infection and perceived stress (r=.378; p<.001), and the weakest between fear of COVID and perceived stress (r=.294; p<.001). Additionally, it turned out that other variables were also correlated, especially the fear of COVID with the risk of infection (r=.785; p<.001). Detailed data is shown in Table 2.

Table 2. Pearson's r correlation coefficients for variables related to the perception of a pandemic situation and perceived stress

Variable	1	2	3	4
Perceived stress		.355*	.214*	.223*
Risk of infection	.355*		.401*	.785*
Threat perception	.214*	.401*		.380
Fear of COVID	.223*	.785*	.380*	

* Pearson's r for p<.05

To additionally determine to what extent the variables related to the perception of the pandemic situation explain the variance of the perceived stress and to partially reduce the covariance effect of independent variables, it was decided to use the multiple regression analysis. It turned out that the model consisted of the risk of infection, the perception of threat and fear of COVID as predictors and perceived stress as the explained variable was statistically significant and explains 14% of the variability (R^2=0.42; F=5.625; p<.001; f^2=0.70). In this model, only one predictor was statistically significant — the risk of infection (β=.441; t=2.935; p<.01).

For the purpose of checking the influence of sociodemographic factors on the perceived stress during a pandemic and due to non-numeric scale of these variables, it was decided to use the ANOVA method. The level of stress turned out to be differentiated by the fear of being infected while performing professional duties (M_{yes}=26.65; M_{no}=18.40; F=9.068; p=.003; η^2=.08) and the assessment of the availability of self-protection measures ($M_{very\ bad}$=23.600; M_{bad}=26.69; $M_{moderate}$=27.91; M_{good}=22.437; $M_{very\ good}$=21.500; F=3.542; p=.01; η^2=.03). The following relationships turned out to be statistically insignificant: education (F=1.207; p=.27); age (F=.577; p=.68), size of the city of residence (F=.258; p=.77) and workplace (F=1.507; p=.18).

Discussion

The spread of COVID-19 is actually causing unprecedented psychological stress in people around the world, especially in the health care workers. Nurses are on the front lines of the fight against one of the worst disasters in history in terms of hospitalization and deaths. In such a dramatic state, they are at high risk of contracting the disease [21] as well as an increased risk of developing mental health symptoms such as fear, anxiety, depression, insomnia, work-related stress, and post-traumatic stress disorder [5,6].

The current study has shown that nurses experience a high level of fear of COVID-19 (24,4), higher than general population (21,4), where the level of fear of COVID-19 was measured by the same questionnaire [20]. Research suggest that the prevalence of fear of COVID-19 among health care workers during current pandemic ranged from 22.6% to 36.3% [22]. It is significantly higher than those observed in the population overall. Among health care professionals, it is nurses who feel the highest fear of COVID-19 [23,24]. The main source of concern for nurses during the COVID-19 pandemic was the fear of being infected or unknowingly infecting others [25]. Shanafelt, Ripp, and Trockel [26] identified other sources of fear of COVID-19 in nurses,

including a lack of personal protective equipment, no access to COVID-19 testing, fear of transmitting coronavirus at work. Nurses fear that they will not receive adequate support from their workplace and the government if they become infected. They are also afraid of working in an infectious diseases ward unfamiliar to them and lack of accurate information about COVID-19 [3].

The present study also showed that Polish nurses perceived the risk of COVID-19 infection and perceived threat as high. This has also been shown in other studies [6] where health care workers believed they were more likely to contract the virus than their family members, which is associated with many hours of work in the hospital. Italian study also found that health care workers were more worried about their family members than themselves. It can be assumed suggesting that an important concern for healthcare professionals about COVID-19 is the possibility of transmitting the infection to their family members.

In addition, studies show that among health care workers it was nurses who assessed a greater risk of infection compared to doctors and other health care professionals. Nurses were also more concerned about the possibility of infection and transferring that intention to their family members. This may be because nurses work closer to patients than doctors and other staff, carrying out activities that often require repeated and prolonged contact with patients. This coexists with the fact that nurses are tested less frequently compared to doctors, objectively increases their likelihood of becoming infected and becoming a potential carrier of the virus, possibly asymptomatic, causing transmission among family members [14].

In the current study it was shown that, fear of COVID-19, risk perception and perceived threat are related to perceived stress. Among the examined variables, the perception of risk was the most significant for the perceived stress. The level of stress experienced by nurses found in the study is very high. Current study's mean result in the PSS-10 questionnaire (26.3) is higher compared to the result recorded for the general Polish population during current pandemic (20.6) [20] using the same questionnaire. It is also higher than the population average (<13 according to Cohen [27]; 16.6 for the Polish population according to Juczyński [28]. It can therefore be concluded that health care workers, and above all nurses, experienced particularly high level of stress during the COVID-19 pandemic. Crisis caused by COVID-19 is putting enormous pressure on nursing services. When nurses are exposed to a work with high work demands and low resources, this may lead to higher work stress and greater symptoms of physical and mental distress. Psychological stress, as well as other variables related to COVID-19 risk perception, is higher in nurses than in other medical workers [29]. It was also confirmed during the previous SARS pandemic [30]. This may be due to the fact that nurses are in close contact with patients.

The high prevalence of COVID-19, its novelty and highly contagious nature, and the associated morbidity and mortality rates is related to unprecedented demand for health and social services worldwide. In addition to admitting to hospital large numbers of critically ill patients, the care requirements for nurses in the community, nursing homes, and social welfare homes also increased. These demands must be met by an already exhausted workforce and even more depleted at that time due to infection, self-isolation and family responsibilities in the face of the crisis. The nature of care itself and new ways of working are also potentially very stressful for nurses. They don't only experience an increase in intensity of their work, but have to adapt to new protocols. Nurses more and more often witness deaths of patients due to COVID and accompany them in the last hours of their lives because due to the principles of isolation, having a family by the bed is not possible. Therefore, nurses often replace family members and facilitate remote access for loved ones [31].

Research indicates that global pandemic lead to high nurses' concern for personal or family health in relation with direct exposure to a potentially deadly virus [32]. Other stressors seen in research include concerns about shortages in personal protective equipment (PPE), working in an unfamiliar environment or care system, and a lack of organizational support. Additionally, psychological conflicts have been reported between health professionals' responsibility to care for patients and medical workers right to be protected from the potentially deadly virus [25,29,31].

British research [31] point to other sources of stress for nurses during the COVID pandemic such as insufficient number of tests for most frontline workers, discomfort and fatigue resulting from long shifts spent wearing full personal protective equipment, sore faces after so many hours wearing masks, communication barriers with co-workers and patients when wearing full PPE and moral suffering resulting from resource-limited therapeutic decisions. The cause of stress among nurses is also related to the experiencing stigma due to the working in hospital. By their local community and their neighbours they can be treated as plague spreaders. At the beginning of the pandemic in Poland, media reported attacks on health care workers and, for example, not allowing them to enter stores or public places. Furthermore, due to the growing number of cases of the disease, medical personnel will have to make very difficult moral choices regarding, for example, who to connect to the ventilator. Nurses may experience a moral and ethical conflict with the possibility of moral trauma. Some nurses may also feel

ashamed and guilty for not being able to work directly with patients and support their colleagues, due to their own high risk and vulnerability to the coronavirus.

Conclusions

Persistent exposure to fear and stress may have negative consequences for nurses' physical and psychological health and performance at work. Stress caused by the fear of contracting COVID-19 may negatively affect the quality of nurses' work in relation to patients and affect professional relationships. Many studies point to the negative effects of a high level of fear and stress, including loss of the urge to eat, dizziness, sleep disturbance, and vomiting or nausea. Higher levels of fear have also been associated with impairment of certain bodily functions, negative coping mechanisms (such as increased alcohol or drug consumption), stress, depression, and increased suicidal ideation. Moreover, unmanaged fear and stress can lead to long-term effects on nurses' productivity and job satisfaction, leading to frequent absenteeism [33].

Implications for Nursing Practice

Neurological nurses may be at particular risk of fear, stress, and contagion because of the specific nature of their work. Many patients hospitalized in neurological and neurosurgical wards are characterized by a significant degree of disability, and therefore they require help, care and close contact, which is associated with the possibility of nurse infection. There are also neurological and neurosurgical wards in COVID-19 hospitals where nurses have direct contact with an infected patient. Nurses from neurological wards can also be sent to work in infectious wards due to lack of staff due to illness or quarantine. Currently, the already overloaded health care system is preparing for the third wave of the pandemic and neurological nurses are aware that they may be delegated to work in COVID-19 wards. All of this can cause severe stress, fear and insecurity. Measures to reduce fear of COVID-19 levels, perceived risk and threat among nurses are imperative as that variables have been identified as related to psychological stress. Monitoring the level of stress can be useful in selecting appropriate methods of coping with stress and helping in the preparation of therapeutic programs for nursing staff. Preventing the negative effects of stress is a prerequisite for maintaining high-quality work and satisfaction with it.

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