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EDITORS’ NOTE

Dear Readers!

I am pleased to present the second issue of "Central European Nursing Review" - a peer-reviewed, interdisciplinary journal in the field of medical sciences and health sciences, published by the Nursing Department of the Józef Gołuchowski University of Applied Sciences.

The current issue of the journal allows us to hope that it will prove to be a lasting publishing initiative. Finally, its periodical character has also been shaped - in the future, the journal will be published as an annual. We hope that the values we would like to promote will be preserved. In addition to such fundamental principles as reliability, quality and incorporation into the idea of evidence-based medicine/evidence-based nursing, I would like to draw attention to two aspects. The first is the interdisciplinarity of the journal and the opening of the nursing periodical to authors representing not only health sciences, but also medical sciences, but also pharmacists, lawyers and psychologists dealing with broadly understood health issues. The second aspect is the broad opening of the Polish journal to foreign authors, expressed in the English-language nature of the journal. Regardless of the eventual decision to popularize the journal by admitting Polish-language texts, the editorial office's ambition in the future will certainly be to strongly emphasize its international character.

The current issue consists of five articles. The authors are nurses, doctors and lawyers - from Poland and Ukraine. We hope that in the future the journal will be larger in volume and will expand to include more sections, maintaining the high quality of tests accepted for publication.

We wish you an inspiring read and encourage specialists to contact the editorial office and publish their own valuable articles and materials.

Monika Borek
Editor-In-Chief

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QUALITY OF LIFE AND HEALTH BEHAVIOURS OF PATIENTS WITH END-STAGE RENAL DISEASE[5]

Abstract:
Introduction. *Conservative treatment in patients with renal failure is very often unsuccessful. Failure of the kidneys to function properly results in the need for dialysis. Developments in diagnostic techniques and advances in dialysis techniques allow for longer survival times for patients with end-stage renal failure, but the need to adapt to dialysis appointments makes it more challenging to function and can impair patients' quality of life.*
Objective. *The research assessed the quality of life and health behaviour of patients with end-stage renal disease (ESRD).*
Material and Methods.*The research was conducted between October 2022 and February 2023 among patients with renal failure undergoing dialysis at the Independent Public Health Care Institution in Kolbuszowa and the Independent Public Health Care Institution in Mielec. The research was carried out using a*

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diagnostic survey method. The research tools were the WHOQOL-BREF quality of life questionnaire and the Health Behaviour Inventory (IZZ).

***Results**. The respondents' quality of life is average (90.10%, n=91). The overall level of satisfaction with health is average (62.38%, n=63). Respondents present a high level of health behaviour (M=82.46).*

***Conclusions.** The quality of life of dialysis patients is neither good nor bad. Dialysis patients present high levels of health behaviour. As the duration of dialysis increases, the subjects' quality of life scores decrease.*

Keywords:

Dialysis, quality of life, renal failure, health behaviours.

Introduction

Chronic kidney disease (CKD) requires patients to be permanently treated with dialysis or through a kidney transplant. While dialysis therapy is available to every patient, a kidney transplant requires the organ to be donated from a person during their lifetime or post-mortem, so performing a kidney transplant requires waiting in the transplant queue. The end-stage renal disease (ESRD) treatment by dialysis extends life but also significantly affects patients' perceived quality of life.

Acute Kidney Injury (AKI) is the term that has replaced the term "acute renal failure". According to experts, AKI is a more capacious term, as only issues of more advanced forms of renal impairment are covered under the term failure, while AKI is defined as a condition in which there is a rapid deterioration of renal function within hours or weeks accompanied by retention of nitrogen and creatinine metabolic products.[1] The epidemiology of AKI is difficult to determine. No standardised disease registries make it difficult to assess the incidence accurately. Based on the available data, it can be estimated that this problem occurs in nearly 3–7% of patients who undergo hospital treatment.[2]

AKI can be divided into three main categories, representing the aetiology of the disease. Therefore, the following causes are distinguished: pre-renal, renal, and extra-renal.[3] The causes of the onset of AKI are fundamental in the diagnostic and therapeutic scope of the disease.[4]

CKD is a multisymptomatic syndrome resulting from permanent damage or reduction in the number of active nephrons destroyed by various disease processes in the renal parenchyma. CKD can be divided into five stages of development. The stages of CKD depend on the degree of renal function, which is measured by the glomerular filtration rate GFR.[5]

Deterioration of renal function is widespread following most chronic nephropathies. The highest proportions of causes of end-stage CKD in Poland are diabetic nephropathy, glomerulonephritis, and hypertensive nephropathy.[6]

CKD, especially in its early stages, may be asymptomatic or sparsely symptomatic. Sometimes, even in advanced stages, the slow buildup of symptoms allows patients to slowly become accustomed to them so that over a long period of the disease, patients do not experience any additional specific symptoms that would refer them to a doctor for diagnosis.[5]

Unfortunately, no single simple test precisely diagnoses or recognises CKD at any stage. A test that can help to guide towards a diagnosis of kidney damage is the determination of serum creatinine and, based on this, an estimate of glomerular filtration rate. In addition, a general urine examination is performed to assess the presence of protein in the urine and urine sediment.[5]

Renal replacement therapy aims to remove water and metabolic metabolites from the body, correct electrolyte, and acid-base disturbances, and prevent complications.[7] The following methods of renal replacement therapy are distinguished: haemodialysis, peritoneal dialysis, and kidney transplantation. Dialysis therapy is the primary treatment for renal failure, which is used in nearly 80% of patients undergoing renal replacement therapy.[8]

Currently, there are no absolute contraindications to dialysis therapy, while relative contraindications include end-stage incurable diseases and cerebral organic syndromes, as in the course of these diseases, dialysis treatment has no impact on the patient’s health.[9]

In ESRD, kidney transplantation may also be an option for renal replacement therapy. The first successful kidney transplant in Poland was performed in 1966. By 2022, 857 kidneys had been transplanted in Poland, of which approximately 784,000 were from deceased donors and 73 from living donors.[10]

According to current Polish legislation, the condition for receiving a transplant is that the patient who needs an organ transplant is placed on the National Waiting List (KLO), which is maintained by the organisational and coordination centre for transplantation, “Poltransplant”.[10]

The indication for renal replacement therapy in the form of kidney transplantation is the qualification of a patient diagnosed with stage 5 of CKD, in which the glomerular filtration rate is less than 15 mL/min/1.73 m^2. In diabetic patients, the glomerular filtration rate should be less than 20 mL/min/1.73 m^2. In patients with type 1 diabetes, kidney and pancreas transplantation are considered simultaneously.[11]

It should be emphasised, however, that regardless of the stage of renal disease, each person requiring renal replacement therapy should be considered as a potential candidate for renal transplantation. A patient’s eligibility for a kidney transplant is contingent on the patient's successful qualification for the surgical procedure and treatment that reduces the body's defence potential. It is also necessary to assess the health and the presence of absolute and relative contraindications.[12]

The issue of quality of life in the social sciences emerged in the second half of the 20th century. This issue was already dealt with by ancient philosophers who tried to obtain an answer to the question of who man is, what value their life has, as well as how they should live to achieve complete happiness.[13]

With the development of interest in quality of life, this concept was transferred to the medical field. It was mainly related to the fact that traditional health assessment methods were increasingly being defied, thus attempting to connect the patient's health holistically based on their biomedical pattern.[14]

A contemporary pioneer of quality-of-life research was Campbell. Campbell was the first to attempt to assess Americans' lives. To achieve his objectives, he used a scale with questions on fifteen different areas of subjects' lives. These questions concerned satisfaction with health, leisure activities, family and social relationships, education, and work.[13]

From the point of view of medical science, Karnowski pioneered introducing the concept of quality of life in this field of science. He was the first to point out that the result of treatment should be assessed not only by the patient's health improvement but also by the improvement in their activity and mobility.[15]

The definition of quality of life presented by de Walden-Gałuszko refers to the patient's self-image of self-reported life situation, which is made over a specific period and considers the person's adopted hierarchy of values.[16]

In medical science, the most commonly used definition of quality of life is health-related quality of life (HRQoL), which Schipper introduced. According to this definition's author, HRQoL is the "*functional effect of disease and its treatment, as perceived (experienced) by the patient"*. Schipper's research focused on effective human functioning both in health, illness and during treatment.[17] Quality of life in medicine is often based on five core areas of quality of life, including physical, mental, social, cognitive functioning and a sense of well-being.[17]

The assessment of quality of life, which depends on the patient's state of health, especially in subjects with chronic illnesses, is a crucial and reliable indicator of the usefulness and effectiveness of the therapies used. Assessing the quality of life of patients during the disease and treatment allows the assessment of the impact of the disease and treatment on the patient's life. Analysis of patients' quality of life gives a broader view of the patient through their expectations of needs and capabilities.[18]

The analysis of quality of life requires several tools to measure HRQoL. For this, questionnaires or analogue scales are most commonly used. Irrespective of the type of research tool used, it should be borne in mind that the quality of life perceived by the respondent is individual and variable over time.[18]

To assess HRQoL, questionnaires can be used to evaluate patients’ overall quality of life and specific questionnaires tailored to a particular condition or health problem.[19] The choice of the appropriate questionnaire depends on the type of clinical situation of the patient or the study population. It is also necessary to know the study population, the type of condition being assessed and the size of the study group, which will influence the choice of questionnaire. The selection of the research tool should consider the frequency with which quality of life is measured during a clinical trial and the duration of follow-up to ensure reliable results.[19]

The health of individuals and populations in all cultures depends on subjects knowing and understanding what factors influence their health and whether they take this into account in their daily lives — they largely depend on their actions to promote and care for their health.[20] The set of health behaviours and attitudes is a determinant of both individual and population health status. Health-related behaviours are of interest to representatives of various scientific disciplines, and they offer a variety of definitions and classifications. Health or health-related behaviours are any behaviour or activity of an individual that is part of everyday life and influences their health status — they involve the practical application of their knowledge about health and illness. They are the subject of relatively free individual choices and decisions — the part of the factors affecting health over which each individual has the most control.[20]

Changing an individual’s behaviour in any sphere of their life is difficult, especially when they do not feel the need to change. The existing reality indicates the need to modify existing behaviours due to their negative impact on health. Two types of health behaviour were distinguished, i.e., pro-health and anti-health.

Research Objective

The research assessed the quality of life and health behaviour of patients with ESRD.

Material and Methods

The research was carried out by a diagnostic survey, using a survey technique with standardised questionnaires, i.e., the WHOQOL-Bref questionnaire to assess quality of life and the Health Behaviour Inventory (pl. Inwentarz zachowań zdrowotnych, IZZ).

The results obtained were statistically analysed using the following tests: Shapiro-Wilk, Kruskal-Wallis, Comparisons of scores on the quality-of-life subscales and health behaviour subscales were made using Friedman's ANOVA test, where pairwise comparisons were made using Wilcoxon's paired rank-order test with Bonferroni correction. A significance level of $p<0.05$ was adopted, indicating statistically significant differences or relationships.

The study was conducted between October 2022 and February 2023 among patients with renal failure undergoing dialysis at the Independent Public Health Care Institution in Kolbuszowa and the Independent Public Health Care Institution in Mielec.

Results

One hundred one respondents participated in the study, including 49.50% female and 50.50% male subjects. Those aged up to 50 years were — 25.74%, and respondents aged 51–65 were 45.55%, with a mean age of 57.41 years with a median of 59 years. Respondents living in rural areas accounted for 53.47%, while those living in urban areas accounted for 46.53%. The vast majority of respondents — 64.36%- were pensioners. The economically active accounted for 27.70%, while the unemployed accounted for 5.94%. Respondents were unmarried, 14.85%, in relationships — 58.42%, while widows and widowers accounted for 26.73%. In terms of education, the largest group comprised respondents with secondary education — 68.32%, while the smallest group comprised respondents with higher education — 3.96%. Most subjects had been on dialysis for five years and above — 60.40%, while the smallest part of the group had been on dialysis for less than a year — 2.97%. The overwhelming number of subjects were dialysed three times a week — 89.11%. Twice-weekly dialysis was taken by 7.92%, while four times a week was taken by 2.97%.

By analysing the results of the WHQoL-BREF questionnaire, the subjects' self-reported quality of life was identified. Most respondents rated their quality of life as neither good nor bad — 90.10%, 8.91% as good and 0.99% as bad.

In the area of respondents' satisfaction with their health, most respondents could not assess their health, choosing the answer neither satisfied nor dissatisfied — 62.38%. Dissatisfied with their health was 35.64%, while satisfied was 1.98%.

The overall assessment of quality-of-life scores provides an insight into the extent to which respondents show the best and the worst results in terms of perceived quality of life. Obtaining such insights allows measures to be introduced to improve the quality of life in the areas rated lowest. The results of measuring the quality of life in individual quality of life domains are presented in Table 1.

Table 1. Results of Quality-of-Life Measurement in Study Group

Quality of Life	**M**	**Me**	**SD**
Self-reported quality of life	3.08	3.0	0.31
Satisfaction with health	2.66	3.0	0.52
Somatic sphere	47.66	44.0	9.14
Psychological sphere	56.00	56.0	7.76
Social sphere	61.15	56.0	11.82
Environmental sphere	64.35	63.0	7.51
Comparison of quality-of-life spheres	$Chi^2_{ANOVA} = 190.952$, $p<0.001$		
Pairwise comparisons of spheres:			
somatic vs. psychological	$Z=7.799$, $p_B<0.001$		
somatic vs. social	$Z=7.698$, $p_B<0.001$		
somatic vs. environmental	$Z=8.555$, $p_B<0.001$		
psychological vs. social	$Z=4.549$, $p_B<0.001$		
psychological vs. environmental	$Z=7.397$, $p_B<0.001$		
social vs. community	$Z=3.797$, $p_B<0.001$		

Source: own study. M — mean, Me — median, SD — standard deviation, Chi^2_{ANOVA} *— comparison of dependent variables (non-parametric test), Z — Wilcoxon paired t test,* p_B *— statistical significance with Bonferroni correction*

A statistically significant relationship was found between all spheres of quality of life. The subjects' quality of life score in the somatic domain is statistically significantly different from the score in the psychological domain ($p<0.001$). Respondents have a statistically significantly worse quality of life in the somatic sphere ($M=47.66$) than in the psychological sphere ($M=56.00$). Similar differences were shown in terms of quality of life between the somatic and social spheres. Respondents' quality of life in the somatic sphere was significantly lower ($M=47.66$) compared to the social ($M=61.15$) and environmental ($M=64.35$) spheres. Significant range differences were also found in the perception of quality of life between the psychological, social, and environmental spheres. Respondents showed significantly lower quality of life in the psychological sphere ($M=46.00$) compared to the social sphere ($M=61.15$) and the environmental sphere ($M=64.35$). Comparing the quality-of-life scores for the social and environmental spheres, it was found that the respondents' quality of life was higher in the environmental sphere ($M=64.35$) compared to the social sphere ($M=61.15$). There was a statistically significant difference between men and women in social quality of life ($p=0.012$). The women surveyed have a higher quality of life in this sphere (mean in the women's group is M=64.26 with a median Me=69) than men (mean in the men's group is M=58.10 with a median Me=56). There were no statistically significant differences in the other quality of life indicators between the compared groups of women and men (the results of women and men in the other quality of life spheres and the self-reported quality of life and satisfaction with their health were similar).

The age of the respondents can significantly affect the therapy's effectiveness and determine the respondents' quality of life. The impact of age on the subjects' quality of life was analysed. For the somatic, psychological, and environmental spheres, respondents aged up to 55 years scored statistically significantly higher than respondents aged 56–65 years and higher than respondents aged over 65 years. In contrast, there were no statistically significant differences in this sphere of quality of life between respondents aged 56–65 and those aged 65 and over. No statistically significant differences in quality of life between urban and rural residents were noted.

The chronic disease and how it is treated can affect the need for patients to change or limit their work activity, which can impact the economic conditions and subjects' quality of life. Table 2 presents the results of the analysis of the respondents' quality of life in relation to the type of work activity.

Table 2. Differences in Quality of Life by Occupational Activity of Respondents

Quality of Life	**Economically Active**			**Economically Inactive**			**Z**	**p**
	M	**Me**	**SD**	**M**	**Me**	**SD**		
Self-reported quality of life	3.03	3.0	0.18	3.10	3.0	0.34	-0.998	0.318
Satisfaction with health	2.53	3.0	0.51	2.72	3.0	0.51	-1.607	0.108
Somatic sphere	51.33	56.0	9.01	46.11	44.0	8.81	3.123	0.002
Psychological sphere	59.23	56.0	7.50	54.63	56.0	7.50	3.772	<0.001
Social sphere	64.17	69.0	14.11	59.87	56.0	10.56	2.145	0.032
Environmental sphere	69.13	69.0	6.75	62.32	63.0	6.91	4.639	0.000

Source: own study.

In each of the quality-of-life spheres, economically active respondents showed a higher quality of life compared to inactive respondents.

The marital status of the respondents may also be a factor affecting the quality of life of those undergoing dialysis therapy. It may be related to the support and care received from loved ones, or the lack thereof. With this in mind, the impact of marital status on respondents’ quality of life was analysed.

Table 3. Differences in Quality of Life by Marital Status of Respondents

Quality of Life	**I. Single**			**II. Married**			**III. Widow/ Widower**			**H**	**p**	**Inter-group diffe-rences**
	M	**Me**	**SD**	**M**	**Me**	**SD**	**M**	**Me**	**SD**			
Self-repor-ted quality of life	3.07	3.0	0.46	3.10	3.0	0.30	3.04	3.0	0.19	0.854	0.653	–
Satisfaction with health	2.67	3.0	0.72	2.64	3.0	0.48	2.70	3.0	0.47	0.354	0.838	–
Somatic sphere	54.67	56.0	11.11	47.59	44.0	8.33	43.93	44.0	7.57	11.857	0.003	I>III
Psychological sphere	61.80	63.0	10.50	56.42	56.0	6.78	51.85	50.0	5.62	15.948	<0.001	I>II, I>III
Social sphere	58.73	56.0	13.17	63.47	69.0	11.78	57.41	56.0	10.22	5.530	0.063	–
Environmental sphere	67.27	69.0	9.65	65.64	63.0	6.92	59.89	63.0	5.53	13.870	0.001	I>II, I>III

Source: own study.

Marital status was a significant factor in assessing quality of life in the somatic, psychological, and environmental spheres. In terms of the somatic, psychological, and environmental spheres, unmarried subjects rated their quality of life significantly better compared to widowed subjects. Significant differences can also be seen in the psychological and environmental spheres between single subjects and those in relationships. Single subjects rate their quality of life higher.

The last sociodemographic factor analysed that could affect the respondents’ quality of life was the level of education. Table 4 presents the analysis results.

Table 4. Differences in Quality of Life by Respondents’ Education

Quality of Life	**Elementary/ Vocational**			**Secondary/ Higher**			**Z**	**p**
	M	**Me**	**SD**	**M**	**Me**	**SD**		

Self-reported quality of life	3.18	3.0	0.39	3.04	3.0	0.26	2.015	0.044
Satisfaction with health	2.75	3.0	0.52	2.63	3.0	0.51	1.007	0.314
Somatic sphere	44.14	44.0	10.14	49.01	50.0	8.42	-3.063	0.002
Psychological sphere	54.43	56.0	7.73	56.60	56.0	7.73	-1.933	0.053
Social sphere	58.93	56.0	12.35	62.00	69.0	11.59	-1.448	0.148
Environmental sphere	61.46	59.5	9.47	65.45	63.0	6.34	-2.722	0.006

Source: own study.

Statistically significant differences between the overall perception of quality of life and the somatic and environmental spheres can be found. In terms of general perception of quality of life, those with primary/secondary education had a higher quality of life, while in terms of the somatic and environmental spheres, respondents with secondary and higher education had a higher quality of life.

The time elapsed since the start of dialysis therapy can determine the subjects' quality of life, resulting from the subjects' disease. The need to undergo regular treatments may affect the subjects' quality of life assessment.

Table 5. Differences in Quality of Life by Since When Respondents Have Required Dialysis

Quality of Life	**Up to 5 Years**			**More than 5 Years**			**Z**	**p**
	M	**Me**	**SD**	**M**	**Me**	**SD**		
Self-reported quality of life	3.08	3.0	0.35	3.08	3.0	0.28	-0.074	0.941
Satisfaction with health	2.60	3.0	0.59	2.70	3.0	0.46	-1.197	0.231
Somatic sphere	51.38	50.0	10.35	45.23	44.0	7.37	3.097	0.002
Psychological sphere	59.78	59.5	9.37	53.52	56.0	5.24	4.286	<0.001
Social sphere	63.93	69.0	10.76	59.33	56.0	12.21	2.076	0.038
Environmental sphere	67.63	69.0	8.44	62.20	63.0	5.99	3.658	<0.001

Source: own study.

Statistically significant differences based on the duration of dialysis were shown in individual quality-of-life domains. In each quality-of-life domain, subjects requiring dialysis for less than five years had a higher quality of life than those requiring dialysis for more than five years.

During the study, the results obtained using a test — the IZZ — were analysed to determine the level of health behaviour presented by the respondents. The results of this analysis are shown in Table 6.

Table 6. Level of Health Behaviour

Level of Health Behaviour	**N**	**%**
Low	33	32.67
Average	24	23.76
High	44	43.57
In total	101	100.00

Source: own study.

Based on the analysis questions of the IZZ questionnaire, a "health behaviour index" was calculated according to the key to this tool, which was then converted according to norms into a standardised sten scale. On this basis, the number of subjects with low (1–4 sten), average (5–6 sten), and high (7–10 sten) levels of health behaviour was determined. In the study group, 43.57% of respondents had a high, 23.76% average, and 32.67% low level of health behaviour.

A detailed analysis of the IZZ identified the type of health behaviour with the highest and lowest intensity, as shown in Table 7.

Table 7. Measurement Results of Health Behaviour Subscales in Study Group

Health Behaviour	**M**	**Me**	**SD**
Overall health behaviour indicator	82.46	87.0	17.63
Proper eating habits	3.24	3.3	0.84
Prevention behaviours	3.59	3.8	0.90
Positive mental attitudes	3.47	3.3	0.66
Health practices	3.45	3.7	0.99
Comparison of health behaviour subscales	$Chi^2_{ANOVA}=50.657$ $p<0.001$		
Pairwise comparisons of subscales:			
Proper eating habits vs. prevention behaviour	$Z=5.383$, $p_B<0.001$		

Health Behaviour	**M**	**Me**	**SD**
Proper eating habits vs. positive mental attitudes	$Z=4.046, p_B<0.001$		
Proper eating habits vs. health practices	$Z=3.541, p_B<0.002$		
Prevention behaviour vs. positive mental attitudes	$Z=1.806, p_B<0.426$		
Prevention behaviour vs. health practices	$Z=2.191, p_B<0.171$		
Positive mental attitudes vs. health practices	$Z=0.018, p_B<1.000$		

Source: own study.

Statistically significant differences between the health behaviour subscales occurred between proper eating habits and prevention behaviour (higher score in prevention behaviour), between proper eating habits and positive mental attitude (higher score in positive mental attitude) and between proper eating habits and health practices. The other subscales do not differ.

Conclusions

1. The quality of life of dialysis patients is average, and dialysis patients present a high level of health behaviour.
2. Respondents' quality of life scores decrease with increasing duration of dialysis treatment.
3. Respondents rated their quality of life as highest in the environmental domain and lowest in the physical domain.
4. Respondents present the highest level of health behaviours regarding prevention behaviours and the lowest regarding proper eating habits.
5. Only the level of education is a significant factor in the respondents' quality of life assessment.

Discussion

CKD is a serious social and epidemiological problem both in Poland and worldwide. In Poland, the prevalence of CKD is about 15%, while in the world population, it is about 10%. CKD is a multisymptomatic syndrome that arises due to a reduction in the number of active nephrons destroyed by various disease processes occurring in the renal parenchyma. In a high proportion of patients diagnosed with ESRD, it is necessary to implement specialised renal replacement therapy in the form of haemodialysis or peritoneal dialysis. Renal transplantation is also performed in a high proportion of patients.[21]

In the course of kidney disease, it is not only the presence of a chronic, incurable disease that is of concern but also its impact on quality of life. Quality of life and health satisfaction in relation to chronic renal failure is crucial due to the severity of the disease, as well as its stage and the increasing number of patients with this disorder. CKD adversely affects patients' daily functioning and involves many sacrifices, including the need to limit physical activity, change lifestyle, implement restrictions on eating a variety of foods, and spend many hours a week on dialysis. An additional complication for patients with kidney disease is the diet, which makes daily life difficult.

It should be emphasised that the quality of life of dialysis patients is crucial, as, at present, medicine is not able to completely halt the progression of the disease, as well as to reverse the destructive damage to the kidneys. For kidney disease patients on dialysis, health behaviours are also critical and significantly impact the patients' health status. In patients with CKD, implementing positive health behaviours is extremely important as it affects health-promoting behaviours, allowing such patients to maintain the best possible quality of life. Therefore, patients with chronic diseases, especially those with kidney disease, must be able to adhere to the principles of self-care, which means caring for vascular access for haemodialysis, adhering to a proper diet, undertaking physical activity, preventing infections, and using disease prevention.[22]

In our study, the overall quality of life of dialysis patients was average. Most patients described their quality of life as "neither good nor bad".

In a study on the quality of life of dialysis patients conducted by Ponczek et al., it was shown that almost half of the patients rated their quality of life as average, similar to our study's results. Only 35% of patients described their quality of life as good or very good, which differs significantly from the results of our study, in which none of the patients surveyed described their quality of life as very good.[23] The study's results on the quality of life of dialysis patients presented by Kocka et al. show that more than half of the subjects (52%) were satisfied with their quality of life despite their existing chronic disease. In comparison, no satisfaction with their quality of life was shown in approximately 20% of subjects.[24]

Our study also analysed the extent of quality of life, with patients rating it as highest and lowest. It was shown that the highest quality of life was presented by the study patients in the environmental domain and the lowest in the physical domain. In the study by Ponczek et al., the respondents obtained the highest scores regarding quality of life in the psychological and environmental domains and the lowest in the physical domain.[23] The results of this study can be seen to partially coincide with the results of our research, especially in terms of the lowest rated domain of physical quality of life. Similarly, the study of Gętek et al. showed that respondents scored lowest in the physical domain, which is consistent with the results of our study, but highest in the environmental and social domain of quality of life, which does not coincide with the results of our study.[25] CKD reduces the range of opportunities related to physical activity, resulting in high dissatisfaction and a decrease in quality of life in this domain. Dialysis patients also often struggle with lowered mood, sleep disturbances, weakness, and pain, which can affect quality of life. In addition, the diagnosis of a chronic, incurable disease can have the effect of triggering negative emotions such as anxiety, anger, fear, and the need to change lifestyles, habits and diets resulting from a chronic disease places an additional burden on patients.

Our study also analysed the impact of sociodemographic factors on the quality of life of respondents. It was shown that only the level of education was a significant factor in the subjects' quality of life assessment and the duration of dialysis. As the duration of dialysis increased, the subjects' quality of life scores decreased. The study by Pączek et al. showed that patients with a better financial situation rated their quality of life higher.[23] Similar conclusions are drawn by the authors of other studies, according to which financial independence and independence in daily activities influence the feeling of a better quality of life. During the illness and the need for long-term treatment, the financial balance is disrupted, and the dependence on third parties affects the existing life of those who care for the patient at home, which is also reflected in a deterioration of the carer's and patient's quality of life. For many patients, the reduction in quality of life was also a result of losing their job or having to apply for a disability pension for reasons and disorganising their daily schedule and dialysis, resulting in a worse financial situation[26,27,28]

Ponczek et al. also points out that quality of life is determined by the length of dialysis treatment. The authors note that patients' quality of life decreases as the number of years of ongoing treatment increases, which is consistent with the results of our study.[23] In the study by Grochans et al., it has also been confirmed that subjects on dialysis for long periods are characterised by fatigue, mental fatigue, and impaired cognitive functioning, which are associated with lower satisfaction and quality of life scores.[29] The negative impact of haemodialysis duration on quality of life is also pointed out by Gerasimoula et al.[30] The analysis of the effects of sociodemographic factors on patients' quality of life showed that only the level of education was a significant factor in assessing patients' quality of life. A higher quality of life was characterised by those with a university education. The impact of education level on the quality of life of dialysis patients is also highlighted by Pączek et al. They showed that quality of life in the physical, psychological, and environmental domains was highest among patients with higher education.[23] Kocka et al. also confirm that there is a relationship between quality of life and education level, especially in the social sphere. Results converging on the effect of educational level on quality of life are also presented by Gerassimoula et al., reporting that subjects with higher education rate their quality of life better.[24,30]

In the care of the dialysis patient, particular attention is paid to the patient's informed participation in treatment and care. Patients are expected to be proactive and to cooperate multidimensionally with healthcare professionals, which is directly linked to the implementation of health-promoting behaviours in patients' daily lives.

Our study also attempted to assess the level of health behaviour of dialysis patients. A high level of health behaviour was demonstrated in 43.57% of respondents. In addition, it was shown that the respondents presented the highest level of health behaviours in terms of prevention behaviours and the lowest in terms of proper eating habits. The level of health behaviour of dialysis patients was also analysed by Gniadek et al. The authors also based the study on the Juczyński IZZ. The study found that the highest-rated category of health behaviour was positive mental attitude, while the lowest-rated was health practices.[31] Such a research result is at odds with the results of our research.

The health behaviour of dialysis patients includes proper vascular access care, an essential aspect of care. The study by Grzelewska et al. showed that among dialysis patients in Łódź centres, the most common sources of information on fistula care were nurses and physicians. This source of knowledge is very often chosen by patients as it is a source of expertise. The authors also highlight that the most common recommendation followed by patients was hygiene of the fistula area. The vast majority of respondents (76%) declared that they check the noise of the fistula every day and therefore monitor its proper functioning.[32]

In dialysis patients, it is also worth paying attention to diet, as it is an important predictor of their survival. One of the main conditions of malnutrition is reduced food intake and reduced nutrient supply resulting from the elimination of certain food components due to the need for dialysis. It should be emphasised that, while it is the right approach to eliminate ingredients that increase, for example, the amount of potassium and sodium in the diet, a reduced supply of nutrients also becomes a cause of weakness, decreased immunity and, consequently, increased hospitalisation and mortality. Particular care should be taken to ensure that the meals taken by dialysis patients are appropriately balanced.

In conclusion, it is important to note that improving the quality of life and health satisfaction of patients struggling with CKD should be one of the main priorities of interdisciplinary care for dialysis patients. It is very important to pay close attention to the comfort of the dialysis patient and to provide dialysis options in such a way that they are least disruptive to the patient. The important role in improving the quality of life of dialysis patients with regard to patient education should also be noted. According to Abraham et al., patients on long-term renal replacement therapy require education. Patients who undergo ongoing refresher training in how to function with ESRD, as well as how to function with the need for systematic dialysis, show a higher quality of life in each domain, especially mental.[33]

The positive impact of education among haemodialysis patients is also highlighted by Gerassimoula et al. In their study, patients with a higher quality of life were those who were well-informed about the health problem and adhered to therapeutic and health behaviour recommendations.[30]

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COPING STRATEGIES IN CHRONIC RADICULALGIA[5]

Abstract:
Introduction. *Pain is a valuable diagnostic symptom, but when it becomes chronic it negatively affects every aspect of a person's life, whether biological or psychological, and prevents them from fulfilling their existing social roles.*
The objective of this paper was to identify coping strategies in chronic pain with a focus on patients with radiculalgia.
Methods. *The study was conducted among 101 patients with chronic radiculalgia staying in one of the spa hospitals in the Podkarpacie region. The study was conducted between January and February 2019 using a diagnostic survey method, and the research tool was the proprietary survey questionnaire and the Coping Strategies Questionnaire (CSQ).*
Results. *The study population was predominantly female (59.4%), over 60 years of age (37.6%), with secondary education (43.6%), employed (41.6%), living in rural areas (53.5%), and overweight (54.5%). The largest group were*

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respondents who declared copying (32.7%) and rated their quality of life as good (51.5%).

Conclusions. *In coping with chronic radiculalgia, respondents most often use a variety of strategies, the dominant one being coping self-statements and increased behavioural activity. The most common causes of chronic radiculalgia are neurological conditions. Patients suffering from chronic radiculalgia can partially reduce their pain by taking painkillers prescribed by their doctor. Subjects with chronic radiculalgia rate their quality of life as good. The chronic radiculalgia felt by the respondents is exacerbated by stressful situations, while the type of work performed does not influence it. Coping with chronic radiculalgia is slightly affected by lifestyle and frequency of medication, while other factors (age, education, place of residence) had no significant effect.*

Keywords:
pain, radiculalgia, chronic pain, pain coping strategies.

Pain is one of the basic symptoms in and a significant challenge for medicine. Moreover, it is part of our lives, accompanying us from birth until death, and its primary function is to warn our body of danger. It is a valuable diagnostic sign, but when its cause is unknown or it is the result of a chronic illness, it ceases to be something good, physiological for a person, and often becomes a disease itself requiring treatment.

Pain is defined as an unpleasant sensory and emotional experience, associated with or described in terms of actual or potential tissue damage.[5]

It is also defined as a sensation created by the irritation of the pain nerve endings of the sensory nerves by external or internal stimuli, usually as a result of a disease process occurring in the body’s tissues.[11]

Subjects who experience pain take action to alleviate it, reduce the emotional tension felt because of it and lessen its impact on daily life. These actions are called pain coping strategies.

Objective

This paper identifies coping strategies in chronic radiculalgia.

Material and Method

The research was carried out in 2019 on the premises of one of the Spa Hospitals in the Podkarpacie region among 101 subjects with chronic radiculalgia.

A diagnostic survey method was used in the research. The research material was collected by means of an interview technique, using the Coping Strategies Questionnaire (CSQ) and a self-administered questionnaire (17 questions on socio-demographic data).

The CSQ assesses the respondent's coping strategies in pain and their effectiveness in managing and reducing pain.

The Polish adaptation of this questionnaire by Z. Juczyński contains 42 statements describing different coping methods and two questions assessing the subject's ability to use different strategies to manage and reduce pain.[6]

The ways of coping with pain reflect six cognitive and one behavioural strategy, which in turn fall under three factors, i.e., active coping (i.e. re-evaluation of pain sensations, ignoring pain sensations, coping self-statements), distraction and taking vicarious action (distraction and increased behavioural activity), and catastrophising and hope-seeking (catastrophising, praying/hoping).

Pearson's independence test ($\chi 2$) demonstrated the relationship between the variables.

Results

One hundred one subjects with chronic radiculalgia participated in the study, including 59.4% females (60 subjects) and 40.6% males (41 subjects).

Among the respondents, the largest group, 67.3%, were married. 13.9% declared that they were widowed, 12.9% were single, which accounted for 12.9% of the total, and 5.9% were divorced.

37.6% of subjects aged 60 and over participated in the survey, and 31.7% were 51 to 60. 16.8% were aged between 41 and 50, 9.9% were aged 31 to 40, and 4% were aged between 18 and 30.

The largest group of respondents, 43.6%, had secondary education, 29.7% had vocational education, 25.7% had higher education, and 1% had elementary education.

Of the respondents, 53.5% lived in rural areas, 37.6% in a town of up to 100,000 inhabitants, and 8.9% lived in a city of more than 100,000 inhabitants.

Assessing the occupational status of the respondents, it was found that the largest group was employed (41.6%), 38.6% were pensioners, 15.8% were persons with disability pension, 3.8% were employers, and one was self-employed.

Among the respondents, the majority were overweight (55 people, i.e. 54.5%), 20.8% were found to be grade I obese, 19.8% had a normal weight, 4.0% were identified as grade II obese, and 1% were underweight.

Among the respondents, 36.6% indicated a type of work other than physical or mental, 332.7% declared that they did mental work, while 30.7% did physical work.

When analysing the results, reference was also made to the duration of pain experienced by the respondents. Among respondents, the largest group were those who did not currently feel pain (27 subjects, 26.7%). 17.8% had experienced pain for about a week, 15.8% had experienced pain for about a month. 8.9% had experienced pain for several months to a year, and 8.9% for 1–3 years. 7.9% had been in pain for 3 to 5 years, 6.9% for 5 to 10 years, and 6.9% more than ten years.

Analysis of situations that exacerbate pain confirmed that the most frequent (39.6%) exacerbation of pain was influenced by lifting. In 24.8%, the pain was exacerbated by sitting and walking, and in 10.9%, by other causes.

As part of chronic pain management, 37.6% have undergone surgery, 24.8% take medication on our, 24.8% exercise with a physiotherapist, 7.9% take medication prescribed by a doctor, and 5.0% indicated other alternative treatments.

When analysing the reasons for the pain experienced by the subjects, it was found that the largest group were those who experienced pain due to neurological disorders (38.6%). Post-traumatic or post-accident complications were indicated as the cause of chronic pain by 19.8% of respondents, while post-disease complications were indicated by 14.9%.

26.7% indicated reasons other than the alternative options included in the survey, including 16% who did not give a reason for their pain, 6% who stated degeneration as the cause, and AS, RA, old age, hard work, and osteoporosis were indicated by 1% respondents each.

Respondents rated their ability to reduce their pain on a scale of 0–6, where 0 meant no ability to reduce pain, and 6 meant the respondent could ultimately reduce pain.

The vast majority, i.e., 62.6%, declared that they could partially reduce pain, 17.2% estimated that they could more than partially reduce their pain, 7.1% could almost entirely reduce pain, 6.1% could completely reduce pain, and 7.1% could less than partially mitigate their pain.

In the context of experiencing chronic pain, a self-assessment of quality of life showed that 51.5% of respondents declared their quality of life as good, 31.7% as average, 14.9% as very good, and 2.0% as “none of the above”, i.e., bad.

For pain management, 56.4% choose a GP as support, 18.8% a neurologist, 11.9% another person (without further details), 7.9% indicate a pain management specialist, and 5.0% choose a doctor with an irrelevant speciality.

Respondents indicated their strategies based on a CSM sheet containing coping strategies in pain (distraction, re-evaluation of pain sensations, catastrophising, ignoring pain sensations, praying/hoping, coping self-statements, and increased behavioural activity).

32.7% of respondents reported coping with chronic pain, 18.8% showed increased behavioural activity, and 16.8% chose a praying/hoping strategy. 13.9% chose distraction, 6.9% chose to ignore sensations, and 2% chose to re-evaluate pain sensations.

The pain coping strategies declared by the respondents were related to gender.

Statistical analysis of gender and coping strategies showed that among men, the predominant attitudes were coping self-statements and praying/hoping attitudes, whereas among women, coping self-statements and increased behavioural activity. The result confirms the correlations between the studied characteristics p=0.062 (Table 1).

Table 1. Chronic Pain Coping Strategies by Gender.

Gender / Pain Coping Strategy		**Female**	**Male**
Distraction	[n]	12	2
	[%]	20.0%	4.9%
Re-evaluation of pain sensations	[n]	2	0
	[%]	3.3%	0.0%
Catastrophising	[n]	4	5
	[%]	6.7%	12.2%
Ignoring pain sensations	[n]	2	5
	[%]	3.3%	12.2%
Praying/hoping	[n]	9	8
	[%]	15.0%	19.5%
Coping self-statements	[n]	18	15
	[%]	30.0%	36.6%
Increased behavioural activity	[n]	13	6
	[%]	21.7%	14.6%
In total	**[n]**	**60**	**41**
df	6		
α	0.05		
χ2	12.0105		
critical value	1.635383		
p	0.062		

Source: own study.

Comparing the age of the respondents to the adopted pain coping strategy, it was found that there was no statistically significant relationship between the age of the respondents and the coping strategy (p>0.999) (Table 2).

Table 2. Impact of Age on Pain Coping Strategies.

Age / Pain Coping Strategy		**18–30**	**31–40**	**41–50**	**51–60**	**60+**
Distraction	[n]	1	0	0	3	10
	[%]	25.0%	0.0%	0.0%	9.4%	26.3%
Re-evaluation of pain sensations	[n]	0	1	0	0	1
	[%]	0.0%	10.0%	0.0%	0.0%	2.6%
Catastrophising	[n]	1	1	2	3	2
	[%]	25.0%	10.0%	11.8%	9.4%	5.3%
Ignoring pain sensations	[n]	1	0	2	0	4
	[%]	25.0%	0.0%	11.8%	0.0%	10.5%
Praying/hoping	[n]	0	1	1	11	4
	[%]	0.0%	10.0%	5.9%	34.4%	10.5%
Coping self-statements	[n]	1	5	9	10	8
	[%]	25.0%	50.0%	52.9%	31.3%	21.1%
Increased behavioural activity	[n]	0	2	3	5	9
	[%]	0.0%	20.0%	17.6%	15.6%	23.7%
In total	**[n]**	**4**	**10**	**17**	**32**	**38**
df	24					
α	0.05					
χ2	1.723624					
critical value	13.84843					
p	>0.999					

Source: own study.

Analysis of the respondents' pain coping strategies in relation to education did not confirm the presence of a statistically significant relationship (p=0.842) (Table 3.)

Table 3. Impact of Education on Pain Coping Strategies.

Education / Pain Coping Strategy		**Elementary**	**Vocational**	**Secondary**	**Higher**
Distraction	[n]	1	5	7	1
	[%]	100.0%	16.7%	15.9%	3.8%
Re-evaluation of	[n]	0	0	0	2

pain sensations	[%]	0.0%	0.0%	0.0%	7.7%
Catastrophising	[n]	0	0	6	3
	[%]	0.0%	0.0%	13.6%	11.5%
Ignoring pain sensations	[n]	0	5	0	2
	[%]	0.0%	16.7%	0.0%	7.7%
Praying/hoping	[n]	0	3	5	9
	[%]	0.0%	10.0%	11.4%	34.6%
Coping self-statements	[n]	0	11	19	3
	[%]	0.0%	36.7%	43.2%	11.5%
Increased behavioural activity	[n]	0	6	7	6
	[%]	0.0%	20.0%	15.9%	23.1%
In total	**[n]**	**1**	**30**	**44**	**26**

df	18
α	0.05
$\chi2$	12.09933
critical value	9.390455
p	0.842

Source: own study.

Statistical analysis did not confirm that the respondents' place of residence was statistically significant on the pain coping strategy they chose (p>0.999) (Table 4).

Table I. Impact of Place of Residence on Pain Coping Strategies.

Place of Residence / Pain Coping Strategy	**Village**		**Town with up to 100,000 inhabitants**	**City with more than 100,000 inhabitants**
Distraction	[n]	6	6	2
	[%]	11.1%	15.8%	22.2%
Re-evaluation of pain sensations	[n]	0	2	0
	[%]	0.0%	5.3%	0.0%
Catastrophising	[n]	6	2	1
	[%]	11.1%	5.3%	11.1%
Ignoring pain sensations	[n]	5	2	0
	[%]	9.3%	5.3%	0.0%
Praying/hoping	[n]	8	7	2
	[%]	14.8%	18.4%	22.2%
Coping self-	[n]	19	11	3

statements	[%]	35.2%	28.9%	33.3%
Increased behavioural activity	[n]	10	8	1
	[%]	18.5%	21.1%	11.1%
In total	**[n]**	**54**	**38**	**9**
df	12			
α	0.05			
$\chi 2$	0.699733			
critical value	5.226029			
p	>0.999			

Source: own study.

Based on the analysis of the correlation of population characteristics, it was observed that there was no correlation between the lifestyle of the respondents and the pain-coping strategy (p=0.335).

Based on Pearson's test of independence (chi-square $\chi 2$), a strong statistical relationship was observed (p=0.008) between the studied characteristics, which means that those taking medication prescribed by a doctor are significantly more likely to be able only partially to reduce their pain (Table 5).

Table 5. Pain Relief Possibilities.

Pain Relief Possibilities / Frequency of Medication	**Less than partially**		**Partially**		**More than partially**		**In total**
	[n]	**[%]**	**[n]**	**[%]**	**[n]**	**[%]**	**[n]**
I don't take any medication for my pain	0	0%	1	25%	3	75%	**4**
I only take over-the-counter products for my pain	5	23%	7	32%	10	45%	**22**
I take ad hoc/periodic medication prescribed by my doctor	1	2%	37	73%	13	25%	**51**
I take regular medication prescribed by my doctor	2	10%	14	70%	4	20%	**20**
Despite the continuous treatment prescribed by my doctor, I still take additional medication because of my pain	0	0%	1	100%	0	0%	**1**
Others	1	33%	2	67%	0	0%	**3**
df	10						

α	0.05
χ2	24.709
critical value	3.9403
p	0.008

Source: own study.

Based on Pearson's test of independence analysis results, the influence of lifestyle on respondents' pain perception can be confirmed. Respondents with an active lifestyle were less likely to experience pain, whereas those with a stressful lifestyle were significantly more likely to have problems. (p=0.002) indicates the presence of a strong statistical relationship between the studied characteristics (Table 6).

Table 6. Impact of Respondents' Lifestyles on Pain Experienced.

Impact of Lifestyle on Pain Experience	**I do not feel pain**		**I feel pain**		**In total**
	[n]	**[%]**	**[n]**	**[%]**	**[n]**
Active	9	40.9%	13	59.1%	**22**
Peaceful	6	18.8%	26	81.3%	**32**
Controlling	2	6.1%	31	93.9%	**33**
Mixed	1	7.1%	13	92.9%	**14**

df	3
α	0.05
χ2	15.2939
critical value	0.3518
p	0.002

Source: own study.

It was found that the type of work performed did not affect the chronic pain experienced by the respondents. The distribution of respondents appeared to be statistically insignificant (p=0.478).

Discussion

Pain is a valuable diagnostic symptom, but when it becomes chronic, it negatively affects every aspect of a person's life, whether biological or psychological and prevents them from fulfilling their existing social roles.

Based on our research, it was found that in coping with chronic radiculalgia, respondents most often use a variety of strategies, with the dominant one being coping self-statements and increased behavioural activity. The least frequent strategy is the re-evaluation of pain sensations.

In the study by Baczewska et al., the most commonly used coping strategies in chronic pain included praying, increased behavioural activity, and coping self-statements.

A significant relationship was found between the severity of pain, education, occupational activity of the subjects and the choice of strategy presented. Inactive subjects, as well as those with lower education were significantly more likely to have coping strategies considered to be a manifestation of ineffective pain management.[3]

Different results were found by Bielan O., Gutowska J., and Ejdys M. in a study conducted among patients with chronic pain hospitalised in medical treatment wards, where patients' quality of life decreased significantly as the incidence of pain increased.[4]

The pain felt by respondents in our study is most often generated or exacerbated by stressful situations and the type of work performed.

The management of chronic pain is a difficult problem and a challenge for medicine, far from being satisfactorily resolved yet. The primary and most commonly used means of pain management is pharmacotherapy, unfortunately, related to a significant burden for the patient and the risk of side effects.

Chronic pain experienced by patients for a variety of reasons is the subject of numerous studies that demonstrate its destructive and negative impact on human health and life.

According to the research, chronic pain is a dynamic phenomenon, and the patients' coping strategies are influenced by factors related to the clinical nature of the pain experienced. There is a need to develop guidelines for working with patients suffering from pain, inter alia, in the course of lower limb ischaemic disease.[5.6]

When analysing coping strategies for chronic pain, the researchers also confirm that patients need appreciative, instrumental, informational, and emotional support in pain, which helps them cope effectively.[7]

Support and assistance in chronic pain require the implementation of a holistic model of a bio-psycho-social approach to the patient for nursing to be effective.[2]

Conclusions

Based on the analysis of the results obtained, the following conclusions were drawn:

1. The most common causes of chronic radiculalgia experienced by respondents are neurological conditions.
2. In coping with chronic radiculalgia, respondents most often use a variety of strategies, the dominant one being coping self-statements and increased behavioural activity.
3. Patients suffering from chronic radiculalgia can partially reduce their pain by taking painkillers prescribed by their doctor.
4. The chronic radiculalgia felt by the respondents is exacerbated by stressful situations, while the type of work performed does not influence it.
5. Coping with chronic radiculalgia was influenced by lifestyle and frequency of medication, while other factors (age, education, place of residence) have no significant impact on coping strategies in chronic pain.

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EFFECT OF INTRAUTERINE CYTOMEGALOVIRUS INFECTION ON PLACENTAL FORMATION AND THE MECHANISM OF PREGNANCY FAILURE[4]

Abstract:
Intrauterine infection occurs as a result of transplacental, amniotic, ascending or descending infection. The spectrum of pathogens is diverse: bacteria, viruses, fungi, protozoa, mycoplasma, chlamydia, and combinations of pathogens. When an infection enters the body of a pregnant woman, pathological changes in the fetus and amniotic fluid structures can have varying degrees of severity, ranging from local to generalised. Cytomegalovirus infection is a widespread infection in the human population, affecting 50 to 100% of the adult population. The infection leads to miscarriage, severe complications during pregnancy, birth of severely premature babies, birth of children with congenital malformations and internal organ pathologies, autism, further lagging in physical and mental development, and disability of children. Timely prevention of CMV infection before pregnancy and during pregnancy, compliance with hygiene standards, knowledge of leading a healthy lifestyle, culture of sexual relations, methods of contraception and methods of preventing infection with sexually transmitted

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infections, rules for caring for disabled children and the elderly , identification and formation of risk groups among pregnant women regarding primary infection or recurrence of a chronic process, timely laboratory diagnosis of the activity of the infectious process and carrying out specific treatment - make it possible to bear a healthy child, give birth to a healthy generation, and, accordingly, for the country - to have a healthy nation.

Keywords:
pregnancy, infection, miscarriage, placenta, cytomegalovirus.

Prenatal infections are diseases of the fetus or newborn resulting from haematogenous (transplacental), amniotic, ascending or descending infection that develops in the late fetal period (after 22 weeks of pregnancy) with clinical manifestations of the disease during the early neonatal period.

Intrauterine infection is a disease of the fetus with pronounced clinical manifestations, the diagnosis of which is based on the detection of a particular pathogen in the blood, cerebrospinal fluid, or urine. The spectrum of pathogens of intrauterine infection is diverse: bacteria, viruses, fungi, protozoa, mycoplasma, chlamydia, and combinations of pathogens [1, 19,21,22]. Any infectious disease that occurs during pregnancy deserves special attention because it poses a threat not only to the pregnant woman but also to the fetus. Immunodeficiency in a pregnant woman contributes to the activation of infection and the entry of the pathogen into the amniotic fluid, placenta, and fetus. Infection of a pregnant woman has a negative impact on the development of pregnancy and the fetus: the formation of placental dysfunction, miscarriage, non-developing pregnancy, fetal delay, fetal anomalies, antenatal fetal death, stillbirth, severe newborn diseases, and disability of children [2]. However, the presence of an infection in a pregnant woman is a risk factor for adverse pregnancy outcome and termination, but does not always indicate fetal infection (2% to 12% of fetal infections occur) [4, 20, 21,22].

Intrauterine infection is the fact that a microorganism invades the fetus, which does not always lead to pathology and therefore cannot be used as a diagnosis.

The risk factors for intrauterine infection include: chronic foci of infection; primary infection during pregnancy, activation of infection; reduced general and local immunity; slightly increased permeability of the placental barrier in the second and third trimester of pregnancy; complicated obstetric and gynaecological history; bad habits; low social and domestic status; occupational hazards. The ways of infection are: haematogenous, ascending, descending, transmural (spread from the uterine wall to the decidual membrane), contact (during passage through the birth canal).

When the infection first enters the body of a pregnant woman, pathological changes in the fetus and perinatal structures can be of varying severity, local or generalised. The degree of fetal damage depends on the intensity of virus replication, gestational age, and virus aggressiveness. In case of secondary infection, a seropositive woman has antiviral antibodies in her body, so the intensity of viral replication and the degree of viremia decreases, and the risk of transmission to the fetus decreases. The peculiarities of pregnancy in case of intrauterine infection of the fetus, depending on the gestational age, are:

- 1-3 weeks of gestation - blastopathy - contact with an infectious agent results in impaired development of the fetal egg (spontaneous miscarriage), death of the embryo (unviable pregnancy);
- 4-12 weeks of gestation - blastopathy - an infectious pathogen penetrates the chorion, causing impaired organ and system formation, which leads to teratogenic and embryotoxic effects - the formation of systemic fetal pathology, developmental defects at the organ and cellular level, and spontaneous miscarriage;
- from 16 to 26 weeks of gestation - early fetopathy - development of a generalised inflammatory reaction with a predominance of alternative and exudative components with the transition to fibro-sclerotic deformation of organs (endocardial fibroelastosis, polycystic lung disease, micro- and hydrocephalus), spontaneous late miscarriage, premature birth;
- from 26 weeks of gestation - late fetopathy - the development of a manifest inflammatory reaction with damage to various organs and systems (hepatitis, encephalitis, pneumonia, interstitial neuritis, thrombocytopenia).

The following echographic signs may indicate the presence of intrauterine infection in the first trimester of pregnancy: increased local uterine tone, chorionic detachment, deformation of the ovum, progression of isthmic-cervical insufficiency, chorionic hypoplasia, enlargement and persistence of the yolk sac, and discrepancy between the size of the embryo and the size of the ovum cavity. Echographic findings in the second and third trimesters of pregnancy indicating the development of fetal infection are as follows placental dysfunction; fetal retardation, fetal distress; high or low water; increase or decrease in placental thickness, presence of pathological inclusions; contrasting of the basal membrane; calcifications in the fetal liver, spleen, brain; polycystic kidney disease, fetal lungs; fibrous inclusions on the papillary muscles and valves of the fetal heart; dilated intestinal loops; presence of inclusions in the amniotic fluid [2,3,21]. Signs of an infectious process are also confirmed by the results of a morphological examination of the afterbirth, which is characterised by specific changes according to the pathogen.

Cytomegalovirus infection is a widespread infection in the human population. Depending on the geographical characteristics of the region, socio-economic, ethnic and age factors, 50 to 100% of the adult population is infected with cytomegalovirus. The causative agent of cytomegalovirus infection is *Cytomegalovirus hominis*, a DNA-containing virus that belongs to the family *Herpesviridae* (human herpesvirus 5), subfamily *Betaherpesvirinae* [5,18,20,22]. All strains of the virus are etiologically significant for humans. Several strains of cytomegalovirus can be isolated from one person. The virus has the ability to form characteristic large cells in infected tissues that look like an owl's eye. Cytomegalovirus is prone to long-term latent persistence in the human body, being released into the environment for a long time. With the development of immunosuppressive conditions (pregnancy, AIDS, corticosteroid therapy, cytostatics), the latent form of cytomegalovirus infection can become clinically evident. When the virus reactivates, it replicates and is massively shed through saliva, urine, breast milk, semen, and cervical mucus, posing a threat of infection to others.

Cytomegalovirus infection is characterised by the haematogenous (transplacental) route of fetal infection. In this case, the virus penetrates the placental barrier and enters the fetal bloodstream through the interventricular space with subsequent dissemination in its organs and systems. It is also possible to develop the syndrome of "infected amniotic fluid", when the virus reaches the amniotic membranes with the bloodstream, adsorbs to them and infects the amniotic fluid. When the placenta is infected with cytomegalovirus, morphological findings include: focal or diffuse villitis; necrosis of villi and their polymorphic infiltration and/or sclerosis; damage to the villus stroma; hemosiderin grains; blood clots in the vessels; lymphocytic and plasma cell infiltration, especially near the vessels. Inclusions characteristic of cytomegaly are less common, usually found in endothelial cells, sometimes in the trophoblast of villi. The damaging effects of the virus result in placental circulatory disorders with thrombosis and vasculitis, cell necrosis, and immunological reactions with the formation of circulating immune complexes. Changes in the morphological and functional state of cell membranes due to activation of lipid peroxidation processes play a major role in the genesis of placental dysfunction. A high risk of developing chronic placental dysfunction in cytomegalovirus infection is a pronounced suppression of energy metabolism enzymes with the development of histotoxic hypoxia. At the same time, under conditions of hypoxia, the reproductive activity of almost all viruses increases in the fetal tissues, so not only viruses that enter the mother's body during acute viral diseases, but also those that persist in it pose a danger. Long-term persistence of cytomegalovirus or frequent reactivation of this infection adversely affects the condition of the placenta, fetal growth and development, leading to placental dysfunction and fetal delay.

The gestational age is an important factor in the prognosis. Pregnancy with cytomegalovirus infection is usually associated with complications. It has been established that the earlier the embryo or fetus is infected, the more severe the consequences are: non-developing pregnancy; spontaneous miscarriage; miscarriage; intrauterine infection; primary and secondary placental dysfunction; fetal abnormalities; fetal growth retardation syndrome; fetal distress; stillbirth; preterm labour; threat of premature birth; premature detachment of a normally located placenta. The degree of fetal damage does not always correspond to the severity of the mother's disease. Severe fetal damage can be observed in cases of mild or inapparent maternal disease, and even in cases of latent virus carriage. Women with latent infection can give birth to a child with no visible lesions, or with the development of mononucleosis-like syndrome, as well as with latent cytomegalovirus syndrome.

In recent years, not only has the incidence of cytomegalovirus infection increased worldwide, but also the clinical course has become more severe and mortality rates have increased. Cytomegaly (or cytomegalovirus (CMV) infection) is a widespread infection on the Earth, which belongs to infectious processes with unique features of interaction at the level of "virus-infected cell" and "virus-immune system". In different countries, the incidence of cytomegalovirus infection ranges from 45 to 98% (economically developed countries - about 60% of the Caucasian population are seropositive since childhood, countries with low economic development - about 90-98%). Congenital cytomegaly, which is formed as a result of intrauterine transmission of the virus (up to 1-1.5% of fetal infection), is particularly dangerous.

The greatest risk of intrauterine infection and development of severe clinical forms of CMV is primary infection in a pregnant woman (40-50% chance of fetal infection). The risk of infection is high in seronegative women (lacking IgG to CMV) involved in caring for sick children, the elderly and immunocompromised. The incidence of clinically evident congenital CMV infection is 0.2% among children born to socially and economically advantaged mothers, and up to 2.2% among children born to mothers with low socioeconomic status. The risk of infection of a child during breastfeeding by a mother with primary CMV infection is 30-70%. After primary infection, the virus persists for years [7,9,13,14]. Decreased immunity during pregnancy can lead to activation of latent infection. In case of reactivation of latent CMV infection, the risk of fetal infection is much lower (from 0.15% to 1%). The epithelial cells of the mucous membranes are the entry gate of infection. The primary reproduction of the virus occurs in leukocytes and mononuclear phagocytes. The virus has the ability to remain latently in the human body for a long time [3,11,19]. With the development of conditions that lead to a decrease in immunity (HIV infection, administration of corticosteroids and cytostatics), CMV infection can progress from latent to clinically manifested forms. The virus is transmitted from person to person with all secretions (saliva, urine, blood, tears, cervical mucus); the ways of infection are airborne, contact, sexual, and mother-to-child. In the case of prenatal infection, the virus is transmitted from mother to fetus via transplacental transmission (the risk increases at the end of pregnancy), in intrapartum infection - by contact with the fetal mucous membranes, and after birth - through breastfeeding. The source of infection for a pregnant woman is younger children with whom she comes into contact in the family; her sexual partners; during the performance of professional duties, visits to healthcare facilities; and during haemotransfusion. Among congenital infections, CMV is the most common cause of developmental disabilities and one of the main reasons for mental retardation in the context of sensorineural deafness. Factors that increase the incidence of intrauterine cytomegalovirus infection include: significant genetic variability of virus strains; high prevalence of CMV infection in a certain category; predominance of subclinical forms; variety of mechanisms and routes of infection; immaturity of the fetal and newborn immune systems; reduced functional activity of cellular immunity mechanisms, which can reactivate latent and persistent CMV infection. Placental dysfunction and pathological conditions of the placenta lead to a breach of the placental barrier and fetal infection. In intrapartum infection, the virus enters the fetus through aspiration or ingestion of amniotic fluid, contact with infected maternal birth canal secretions. Antenatal infection can lead to miscarriage, severe fetal damage, and asymptomatic latent carriage of the infection.

Clinical manifestations in the mother during pregnancy with primary infection are nonspecific. The majority of women infected with CMV during pregnancy have no clinical symptoms of the disease, and only a few manifest it as an influenza-like or mononucleosis-like syndrome (lymphadenopathy, hepatosplenomegaly). In the vast majority of cases, congenital CMV infection is asymptomatic or mild or asymptomatic. In the setting of immunodeficiency of various etiologies (HIV infection, drug immunosuppression), disseminated forms of CMV can develop in combination with interstitial pneumonia and vasculitis, lesions of the liver, gastrointestinal tract (specific esophagitis, duodenitis, enterocolitis with ulcerative necrotic damage), central nervous system (encephalopathy, encephalitis), and kidneys, varying in severity. Signs of intrauterine CMV infection can occur both in the newborn period (developmental defects, mental retardation, neonatal disease) and several years later (delayed neuropsychological development, progressive deafness, optic atrophy). Clinical manifestations depend on the gestational age at which the infection occurred: at the stage of blastogenesis (0-14 days), embryo death or the formation of systemic pathology similar to genetic diseases is possible; during embryogenesis (15-75 days), miscarriage and congenital malformations such as microcephaly (53% of children with CMV symptoms), microphthalmia, hydrocephalus can occur [2, 8, 10]. The most typical clinical manifestations of CMV infection are low birth weight (50%, 34% prematurity), jaundice (67%), hepatosplenomegaly (60%), and hepatitis, neurological disorders (encephalitis, seizures, CNS depression - 7-19%), chorioretinitis (14%), haemorrhagic rash (13%), petechiae or purpura (in the form of "blueberry pie"). Laboratory tests reveal thrombocytopenia and anaemia. Computed tomography scans reveal calcifications in the brain in 70% of children with symptoms of CMV. Long-term consequences of intrauterine CMV infection (from 1 to 58%) develop in children with both clinically manifest and latent forms of infection: sensorineural deafness, epilepsy, cerebral palsy, chorioretinitis, optic atrophy, delayed motor and mental development, delayed speech development, and autism. Intra- or postnatal infection of full-term infants usually leads to latent infection. The incubation period of the disease is 2-4 weeks or more. The most common forms are jaundice, hepatomegaly and splenomegaly, thrombocytopenic purpura and haemorrhagic syndrome. Lymphadenopathy, interstitial pneumonia (respiratory distress, tachypnea, cough, apnoea), CNS lesions (encephalitis), chorioretinitis, and sometimes kidney and gastrointestinal tract lesions are often observed. The results of a complete blood count reveal anaemia, leukocytosis or leukopenia, neutropenia, eosinophilia, thrombocytopenia; biochemical tests show an increase in transaminase levels, hyperbilirubinaemia, and coagulation abnormalities. The course of CMV infection is particularly severe in preterm infants [6, 12, 17]. One of the ways of infection in preterm infants born to seronegative mothers may be nosocomial - as a result of haemotransfusion or (rarely) due to violation of sanitary and hygienic standards.

The prognosis depends on the duration of the infection, the gestational age of the child, and the form and course of the disease. The mortality rate for severe CMV infection is 30%. In the acute course of congenital CMV infection with severe organ damage, 90-95% of surviving children have severe consequences. In the latent course of the disease, disability is possible due to damage to the central nervous system, eyesight and hearing. Among the long-term consequences of CMV infection are the following: deafness - in 58% of children with symptomatic disease and in 7% - with asymptomatic disease; delayed neuropsychological development (40-50% - in symptomatic form, 4% - in asymptomatic form); seizures (23% and 1%, respectively); paresis or paralysis (12% vs. 0%); chorioretinitis (20% and 2%, respectively); dental damage (27% and 4%, respectively) [6, 7,11,16].

Conclusion

The number of infected women is steadily increasing every year, which leads to significant difficulties in carrying a pregnancy, severe complications during pregnancy, the birth of severely premature babies, the birth of children with congenital malformations and pathologies of internal organs, physical and mental retardation, complications after birth, and even disability. Timely prevention of CMV infection before pregnancy and during pregnancy: adherence to hygienic norms, knowledge about healthy lifestyle, culture of sexual relations, methods of contraception and methods of preventing infection, sexually transmitted, rules for the care of children with disabilities and the elderly, the identification and formation of risk groups among pregnant women for primary infection or recurrence of the chronic process, timely laboratory diagnosis of infectious process activity and specific treatment make it possible to bear a healthy child, give birth to a healthy generation, and accordingly for the country - to have a healthy nation.

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POST-TRAUMATIC STRESS DISORDER AMONG NURSING STAFF FACING THE COVID-19 PANDEMIC[7]

Abstract:
Introduction: *The SARS-CoV-2 coronavirus pandemic has left a significant impact on the mental health of healthcare workers, including nurses. Some of them have experienced the development of post-traumatic stress disorder (PTSD) symptoms. Therefore, it is crucial to build individual mental resilience,*

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which will help effectively strengthen post-traumatic growth (PTGI). The key factor here is one's ability to cope with stress.

Objective: *The aim of the research was to assess the level of post-traumatic stress among nursing staff in the face of the COVID-19 pandemic.*

Materials and Methods: *The study involved 101 nurses working in anesthesia and intensive care units, general surgery, and internal medicine in a temporary hospital facility. The research was conducted using a diagnostic survey method with the use of an author's questionnaire and standardized research tools: the PCL-5 Questionnaire, Posttraumatic Growth Inventory (PTGI), and Mini-COPE Stress Coping Inventory. A significance level of* $p \leq 0.05$ *was adopted in statistical tests.*

Results: *The study revealed that emotions accompanying nurses' work during the COVID-19 epidemic included helplessness (61.39%), fear (58.42%), and anger (53.47%). At least moderate PTSD symptoms were identified in half of the participants (50.5%). Half of the respondents (50.5%) showed a low level of post-traumatic growth, and only 35.64% exhibited a high level. Strategies used to cope with stress included active coping and engaging in other activities. The intensity of PTSD symptoms significantly positively correlated with blaming and distraction strategies (*$p<0.05$*). Posttraumatic growth was significantly determined by positively oriented strategies such as active coping, planning, and seeking support (*$p<0.001$*). Support received played a significant role in the stress-fighting process and achieving positive changes after trauma.*

Conclusions*: Nursing work in the conditions of the COVID-19 pandemic intensifies the risk of developing PTSD. A variety of stress-coping strategies were employed in the process of achieving positive changes.*

Keywords:
COVID-19, nurse, post-traumatic stress.

Introduction

The year 2020 proved to be exceptional, giving rise to various behaviors and accompanying emotions worldwide [1-3].

The SARS-CoV-2 coronavirus pandemic left a profound impact on healthcare workers, including nurses. Often, a significant portion of responsibility for the health and life of patients rested on them. Nurses, witnessing not only patients but also colleagues falling ill and succumbing to the disease, frequently experienced stress. Undoubtedly, the stress generated a sense of much greater risk than in the general population, involving concerns about infection and the fear of transmitting the infection to loved ones.

Additionally, there was stress related to the compulsion to adapt to many new procedures in their professional work and the difficulties arising from them.

The nursing profession is one of the most stressful occupations, associated with frequent experiences of negative emotions, anxiety, and tension. This is true under "normal" working conditions, and the situation significantly worsened in the face of the epidemiological threat [4]. There is an intensification of anxiety reactions, states of mental and physical exhaustion, helplessness, insomnia, a sense of defeat, sometimes burnout, or depressive episodes [1,5,6].

The level of stress experienced by nurses battling the pandemic can be compared to that of medics during wartime. Extremely stressful and traumatic events resulting from experiencing life-threatening events sometimes exceed the psychological adaptive capacities of nurses. For some personnel, this may lead to the development of post-traumatic stress disorder (PTSD) symptoms [7]. Therefore, building individual psychological resilience during a pandemic is incredibly important, effectively helping to alleviate the consequences of trauma. The key lies in one's ability to cope with stress, professional assistance, and support [5,6].

Aim

The aim of the study was to assess the level of post-traumatic stress among nursing staff in the face of the COVID-19 pandemic.

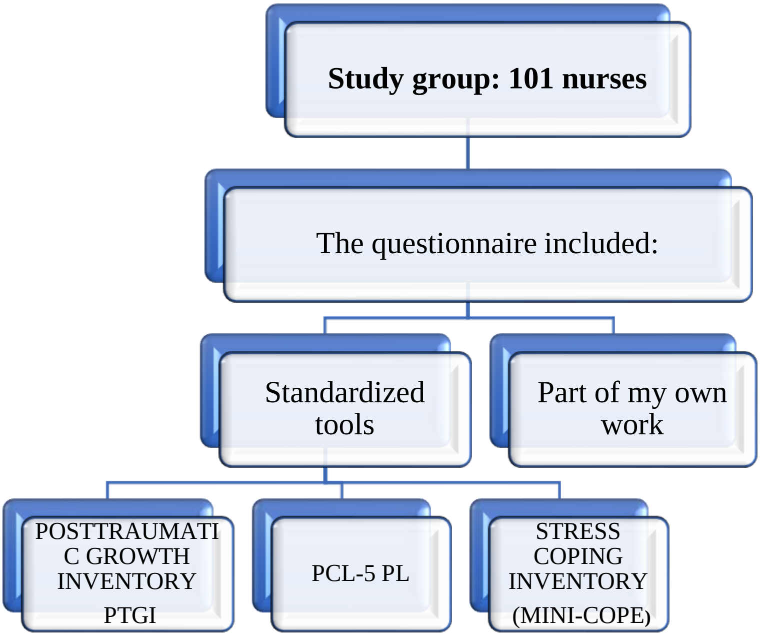
Materials and Methods

The research was conducted among 101 nurses working in a medical facility transformed into a temporary hospital from January 2nd to March 31st, 2022.

A diagnostic survey method was employed for the study. The research tool was a custom questionnaire containing questions related to socio-demographic data and the subject of the study, such as working conditions and atmosphere in the medical facility transformed into a temporary hospital, experienced emotions, and received support. Three additional standardized questionnaires were used, namely the PCL-5 Questionnaire, Posttraumatic Growth Inventory (PTGI), and Mini-COPE Stress Coping Inventory, to assess the level of post-traumatic stress among nursing staff in the face of the COVID-19 pandemic. The questionnaires consisted of closed and semi-open-ended questions, allowing for personal responses. The questions were single or multiple-choice.

The diagram of the aforementioned research tools is presented graphically in Figure 1 below.

Fig. 1. Diagram of the research tool for the examined group of nurses and nursing staff.



Source: Author's own elaboration.

Before the commencement of the study, participants were informed about its purpose and the method of filling out the questionnaires. The research was voluntary and anonymous. It is worth noting that none of the respondents declined to participate.

The collected results underwent quantitative, qualitative, and statistical analysis using Microsoft Office Excel 2021 and SPSS. The relationship between variables was established using Pearson correlation coefficients (R). Group comparisons were analyzed using the Mann-Whitney U test (U) or Kruskal-Wallis test (H) depending on the number of groups. To examine the relationship between nominal variables, the chi-square independence test ($\chi 2$) was used. The $\chi 2$ test is based on comparing observed values (obtained in the study) with theoretical values (calculated assuming no relationship between variables). Large differences indicate a dependency between variables.Values of the test meeting the criterion $p \leq 0.05$ were considered statistically significant.

Three standardized questionnaires were utilized as research tools:

- Posttraumatic Growth Inventory (PTGI) – in the Polish adaptation by N. Ogińska-Bulik and Z. Juczyński. The tool assesses positive changes resulting from the experience of various traumatic events. It consists of 21 positively formulated statements describing various changes following a traumatic event. The inventory examines 4 aspects (factors) of posttraumatic development [7-9]:

  1. Changes in self-perception — after experiencing trauma, an individual perceives new possibilities and feels an increase in personal strength.
  2. Changes in relationships with others — a greater sense of connection with others, increased empathy, and altruism.
  3. Greater appreciation for life — a change in life philosophy, priorities, and greater appreciation for each day.
  4. Spiritual changes — better understanding of spiritual issues and increased religiosity.

– PCL-5 Questionnaire PL by Weathers, Litz, Palmieri, Marx, and Schnurr. National Center for PTSD, USA, in the Polish version: Zawadzki B, Popiel A, Białecka B, and Pragłowska E. University of Warsaw. PCL-5 is a 20-item self-report scale that assesses 20 PTSD symptoms in DSM-5. The PCL-5 questionnaire is designed for screening studies and allows for the temporary diagnosis of PTSD. Responses are given on a 5-point Likert scale for each statement. The interpretation of PCL-5 can be assessed in various ways.The total score for the intensity of symptoms, ranging from 0 to 80 points, is obtained by summing the results for each of the 20 items. The cutoff point of PCL-5 ≥ 33 points indicates probable PTSD [10]. Assessment of PTSD - 20 symptoms in 4 categories:

  1. Re-experiencing (R).
  2. Avoidance (A).
  3. Negative changes in cognitive and emotional aspects (NACM).
  4. Arousal and Reactivity (AR).

– Stress Coping Inventory (Mini-COPE) – developed by Ch. S. Carver, adapted by Z. Juczyński and N. Ogińska-Bulik, a standardized tool used to assess coping in stressful situations [11]. It is a shortened version of the Multidimensional Coping Inventory (COPE). It consists of 28 statements, making up 14 coping styles in stressful situations - 2 items for each coping style. The higher the score, the more a particular coping strategy is utilized in dealing with stress.

Coping strategies are divided into 4 categories, corresponding to assigned scales:

I. Active coping - includes: active coping, planning, positive re-evaluation.
II. Helplessness - includes: substance use, cessation of actions, self-blame.
III. Seeking support - includes: seeking emotional support, seeking

instrumental support.

IV. Avoidant behaviors - includes: distraction, denial, venting.

Results

The study group comprised 101 individuals working as nurses. The majority, 97.03%, were women (n=98). There were 3 men in the group (2.97%). The age of the study group ranged from 30 years (n=46; 45.54%) and below to not exceeding 60 years (n=6; 5.94%).

The overwhelming majority of the respondents felt an increased workload related to the COVID-19 pandemic in their workplace (n=96, 95.05%). Two participants did not feel any additional burden (1.98%), and three individuals had no opinion on this matter (2.97%).

The most commonly cited reasons for increased workload at the workplace were an excess of duties (n=69, 68.32%) and a lack of nursing staff (n=66, 65.35%). Almost half of the respondents additionally identified the use of protective clothing and equipment (n=45, 44.55%) and chaos in work organization (n=45, 44.55%) as burdensome. The least common reasons for burden were increased working hours (n=9, 8.91%) and a lack of personal protective equipment (n=12, 11.88%).

More than half of the respondents unequivocally stated that they experienced stress at work during the COVID-19 pandemic (n=60, 59.41%). Thirty-six respondents considered their work to be rather stressful during this time (35.64%), and five respondents found it to be average in terms of stress (4.95%).

Among the emotions accompanying work in the conditions of the COVID-19 pandemic, respondents most frequently indicated helplessness (n=62, 61.39%), fear (n=59, 58.42%), anger (n=54, 53.47%), and sadness (n=44, 43.56%). In the surveyed group, 18 individuals expressed feelings of loneliness and anticipation each (17.82%), while 17 individuals mentioned a sense of strength, motivation, and surprise each (16.83%). Among the respondents, 15 experienced disgust (14.85%), 14 apathy (13.86%), trust was mentioned by 9 (8.91%), and calmness by 5 (4.95%). Three individuals added a sense of fatigue (2.97%).

The majority of respondents declared receiving support while performing professional duties, with 13 individuals expressing a definite opinion (12.87%) and 44 individuals expressing a rather positive opinion (43.56%). However, almost half of the respondents indicated a lack of support, with 12 individuals expressing a definite lack (11.88%) and 32 individuals expressing a rather negative opinion (31.68%) (Table 1).

Table 1. Received Support as Perceived by Respondents.

Support received	**Number**	**Percentage**
Yes	13	12,87%
Rather yes	44	43,56%
Rather not	32	31,68%
No	12	11,88%
Total	**101**	**100,00%**

Source: own study.

The most commonly indicated source of support was family and close ones (n=59, 58.42%), followed almost equally by nurse colleagues (n=58, 57.43%). Among other sources, 15 individuals (14.85%) mentioned their supervisor, 9 (8.91%) mentioned doctors, and the same number mentioned society. Three individuals each mentioned patients and media (2.97%). None of the surveyed nurses cited the employer as a source of support. One in four respondents stated that they had no support (n=25, 24.75%).

Among the respondents, one in four nurses (n=25) stated that they did not receive support in their work (24.75%), while only 3 individuals declared that they did not need support during the COVID-19 pandemic (2.97%). Comparing the types of expected and received support, emotional support was most commonly expected (n=69, 68.32%) and received (n=56, 55.45%). The second most expected type of support was informational support (n=54, 53.47%), but only 1/5 of the respondents received it (n=20, 19.8%). Another received type of support was social support (n=24, 23.76%), expected by 35.64% of the respondents (n=36). Nearly 1/3 of the respondents expected material support (n=30, 29.7%), and one in ten individuals received it (n=10, 9.9%).

Analysis of PTSD and PTGI Severity in the Studied Group

In the first stage of data analysis, the means of symptoms constituting post-traumatic stress disorder (PTSD) were calculated. The overall mean for the PCL-5 Scale results was 32.73±19.41 points, which, considering the criterion of 33 points, corresponds to the threshold value indicating the presence of PTSD. The means of the four dimensions comprising it were calculated, taking into account the varying number of items for each dimension. Participants showed the highest severity of symptoms in the dimension of arousal and reactivity (M=1.71), followed by avoidance (M=1.67), and negative cognitive and emotional changes (M=1.6). The least severe symptoms were observed in the intrusion dimension, i.e., re-experiencing (M=1.57) (Table 2).

Table 2. PTSD Symptoms according to the PCL-5 Scale in the Studied Group.

Symptoms of PTSD according to the PCL-5 Scale	**M**	**SD**	**Min**	**Max**
PTDS - total score	32,73	19,41	0	80
Introversion - re-experiencing (R)	1,58	1,13	0	20
Avoidance (A)	1,67	1,23	0	8
Negative cognitive and emotional changes (NACM)	1,60	1,07	0	28
Agitation and reactivity (AR)	1,71	1,00	0	24

Source: own study. M – mean, SD – standard deviation.

At least moderate to high severity of PTSD symptoms was found in half of the participants (n=51, 50.5%). The remaining 49.5% (n=50) exhibited low severity of symptoms.

The obtained overall mean for post-traumatic growth (PTGI) was 54.76±29.15 points, corresponding to a 5th percentile value. This result falls within average values. The analysis also examined the areas where the most significant changes occurred. For this purpose, the means of PTGI factors were divided by the number of statements assigned to each factor. The greatest changes occurred in factor 3, indicating a greater appreciation for life (M=2.97), followed by factor 1 – changes in self-perception (M=2.6), and factor 2 – changes in relationships with others (M=2.56). The smallest changes reported by participants were in factor 4 – spiritual changes (M=2.24) (Table 3).

Table 3. Post-traumatic Growth According to the PTGI Questionnaire in the Studied Group.

Post-traumatic growth according to the PTGI questionnaire I	**M**	**SD**	**Min**	**Max**
PTGI total	54,76	29,15	1	105
Factor 1 - Changes in self-perception	2,60	1,35	0	45
Factor 2 - Changes in relationships with others	2,56	1,44	1	35
Factor 3 - Greater appreciation of life	2,97	1,58	0	15
Factor 4 - Spiritual changes	2,24	1,71	0	10

Source: own study. M – mean, SD – standard deviation.

According to the norms developed for the PTGI questionnaire, half of the participants, 51 individuals (50.5%), demonstrated a low level of post-traumatic growth. One-third of the participants (n=36) revealed a high level (35.64%), and 14 participants showed an average level (13.86%).

Next, correlation coefficients were calculated between dimensions of post-traumatic stress and post-traumatic growth. The results are presented in Table IV. The overall mean of PTSD symptoms showed a weak positive correlation with general post-traumatic growth (p=0.11). Among the analyzed dimensions, intrusion weakly and positively correlated significantly with overall growth (p=0.02), changes in self-perception (p=0.02), changes in relationships with others (p=0.01), and spiritual changes (p=0.03). This implies that higher levels of re-experiencing trauma are associated with greater changes in these areas of growth. Furthermore, negative emotionalism positively correlated with overall growth (p=0.03) and changes in self-perception (p=0.01). This indicates that higher intensity of negative emotions is associated with greater changes in overall post-traumatic growth and a better self-perception. Negative correlations were found between avoidance and post-traumatic growth in all its dimensions. Although statistical significance was not demonstrated, it suggests that avoidance of dealing with trauma disrupts positive changes in post-traumatic growth (Table 4).

Table 4. Correlation coefficients between PTSD dimensions and PTGI.

	PTGI Overall		**Factor 1 – Changes in self-perception**		**Factor 2 – Changes in relationships with other**		**Factor 3 – Greater appreciation of life**		**Factor 4 – Spiritual changes**
	R	**p**	**R**	**p**	**R**	**p**	**R**	**p**	**R**
PTDS - total score	0,16	0,11	0,17	0,08	0,14	0,16	0,11	0,17	0,16
Intrusion - re-experiencing (R)	0,23	0,02*	0,23	0,02*	0,25	0,01*	0,17	0,08	0,21
Avoidance (A)	-0,01	0,92	0,01	0,92	-0,04	0,69	-0,02	0,23	-0,06
Negative cognitive and emotional changes (NACM)	0,07	0,48	0,07	0,48	0,05	0,61	0,06	0,55	0,15
Agitation and reactivity(AR)	0,21	0,03*	0,24	0,01*	0,18	0,07	0,13	0,19	0,17

Source: own study. R – Pearson correlation, p – significance level * – statistical significance.

Strategies for Coping with Stress in the Studied Group

Table 5 presents the average results regarding stress coping strategies employed by the participants. The most frequently utilized strategies, as indicated by the mean scores, were active coping (M=3.77) and distraction (M=3.67). Planning (M=3.58) and acceptance (M=3.57) were chosen almost as frequently as coping methods. Emotional and instrumental support-seeking were also relatively common (M=3.22 and M=3.19, respectively). The least utilized strategies included alcohol use (M=1.44), behavioral disengagement (M=2.1), humor (M=2.35), and denial (M=2.43).

Table 5. Stress Coping Strategies According to the Mini-COPE Questionnaire in the Studied Group.

Stress Coping Strategies	**M**	**SD**
Active Coping	3,77	1,13
Planning	3,58	1,32
Instrumental Support Seeking	3,19	1,46
Emotional Support Seeking	3,22	1,58
Blaming	2,66	1,72
Turning to Religion	2,66	2,22
Positive Reframing	3,14	1,52
Venting	2,95	1,54
Acceptance	3,57	1,47
Negation	2,43	1,61
Behavioral Disengagement	3,67	1,44
Giving Up Activitie	2,10	1,56
Alcohol use	1,44	1,80
Sense of humour	2,35	1,68

Source: own study.

Strategies were categorized into four main styles of coping, corresponding to the assigned scales. Means were calculated for each style, considering the varying number of items for each. The most frequently utilized coping styles were active coping (M=3.50) and support-seeking (3.20). Conversely, avoidance behaviors were quite common among participants (M=3.02). The least frequently adopted coping styles were humor (M=1.17) and turning to religion (M=1.33) (Tab. 6).

Table 6. Stress Coping Strategies in the Studied Group.

Styles of coping with stress	**M**	**SD**
Active coping	3,50	1,18
Helplessness	2,07	1,50
Support Seeking	3,20	1,42
Avoidance behaviors	3,02	1,20
Turning to Religion	1,33	1,11
Acceptance	1,79	0,74
Sense of humour	1,17	0,8

Source: own study.

Discussion

Nursing staff belongs to a group of professionals exposed to various types of stressors, including those of a traumatic nature. Nurses are the first individuals to provide professional assistance to patients and often have the most frequent contact with them. The threat is further compounded by the specific working conditions, such as the state of the COVID-19 epidemic. Working continuously in conditions of constant direct risk of infection, nurses are particularly susceptible to the psychological effects of the pandemic. In addition to the risk of viral illness, attention should also be paid to other stress-inducing factors, including concern about infecting loved ones, fatigue from excessive duties, and social stigma. The experience of trauma entails a range of negative consequences, including experiencing negative emotions such as fear, anger, or helplessness. Excess or accumulation of these emotions can lead to the development of post-traumatic stress disorder.

From our own research, it is evident that almost all nurses felt an increased workload related to the COVID-19 pandemic in their workplace (95.05%). The most frequently cited reasons for increased workload were excessive duties (68.32%), a lack of nursing staff (65.35%), the use of protective clothing and equipment (44.55%), and chaos in work organization (44.55%). Excessive workload contributed to an increase in the level of stress experienced by all respondents, with more than half feeling it significantly (59.41%). Among the emotions accompanying work in the conditions of the COVID-19 epidemic, respondents most frequently indicated helplessness (61.39%), fear (58.42%), anger (53.47%), and sadness (43.56%). Half of the respondents pointed to a moderate or high risk of developing PTSD (50.5%). The participants exhibited the greatest intensity of symptoms in the dimensions of arousal and reactivity, as well as avoidance.

Especially vulnerable to the psychological effects of the pandemic, healthcare workers, including nurses, are confirmed by studies conducted by other authors. In Buchelt's research, it was found that the epidemiological situation and working with coronavirus patients negatively impact the mental well-being of nurses. 38% of nurses reported a deterioration in mental health due to the COVID-19 epidemic. Key emotions accompanying work during the pandemic included concerns about the health and lives of loved ones (65.6%), anxiety (57.5%), psychological overload (48.2%), concerns about one's own health and life (36.3%), helplessness (25.6%), anger (25%), and fear (23.8%).

In addition to the mentioned factors, another source of stress for nurses was the world and society shaped by media influence. 33.8% of nurses participating in the study experienced online hate, primarily directed at themselves but also affecting their close ones (children, spouses, partners, parents, or friends). Manifestations of this included difficulties in enrolling children in preschool (school), property destruction, offensive insults, and refusal of services.

Research by Fukowska and Koweszko indicates that medical personnel during the COVID-19 pandemic show higher levels of stress, depression, and anxiety compared to non-medical professionals. These changes were most pronounced in the group of nurses. Similar results were obtained in studies conducted in China during the COVID-19 pandemic among approximately 10,000 doctors and nurses. Nurses, compared to doctors, exhibited significantly higher levels of anxiety and depression.

In Kang's research and other authors, direct contact with COVID-19 patients had a significant impact on the intensity of emotional disorders. Similarly, from our own studies, it appears that significantly greater intensity of PTSD symptoms pertained to individuals in contact with infected patients.

Studies conducted by Lai and other authors among Chinese hospital workers demonstrated that the current pandemic situation results in insomnia (34%), chronic anxiety (44.6%), depression (50.4%), and stress (71.5%) among the staff. It was emphasized that a higher risk of disorders exists among nurses than among doctors.

According to other Chinese studies conducted among medical workers exposed to SARS-CoV-2 infection, the most common disorders are post-traumatic stress disorder (73.4%), depression (50.7%), anxiety (44.7%), and insomnia (36.1%).

Research on traumatic stress has also provided data indicating that experiencing trauma can lead to the emergence of positive changes afterward. This is evidenced by the phenomenon of post-traumatic growth (PTGI), which occurs as a result of attempts to cope in difficult situations and becomes a source of development for individuals experiencing pathological stress.

In terms of changes in self-perception and relationships with others, the lowest changes were observed in the spiritual sphere. It was also demonstrated that the higher the intensity of trauma re-experiencing, the more significant the changes occurred in the areas of post-traumatic development. Additionally, negative emotional states positively correlated with overall post-traumatic development.

On the other hand, it was found that avoiding confronting trauma leads to a disturbance in positive changes in post-traumatic development. Effects of post-traumatic changes more aligned with our own research were obtained by Ogińska-Bulik in studies among medical workers, including paramedics and nurses. Among the surveyed employees, 27.6% revealed a low level of post-traumatic growth, 38.9% had a moderate level, and 33.5% experienced a high level. The research emphasizes that post-traumatic development is not merely a return to a state of balance after a traumatic experience. This phenomenon is something more, indicating that individuals undergo a transformation as a result of the trauma, allowing for a higher level of functioning than before. This implies that these individuals become stronger, more mature, self-assured, and value-sensitive towards others.

Numerous factors determine the occurrence of post-traumatic development, with coping mechanisms playing a crucial role. Factors favoring post-traumatic growth include acceptance, positive reevaluation, planning, coping based on activity and task, and to some extent, religion and a sense of humor.

In our own research, strategies most frequently utilized by nurses included active coping, planning, acceptance, and seeking emotional and instrumental support. On the other hand, a frequently adopted strategy was diverting attention from the problem by engaging in something else. It was also shown that the intensity of PTSD symptoms significantly positively correlated with blame or distraction strategies from the stressor by engaging in something else, denial, discharge, cessation of actions, or resorting to substances such as alcohol. Positive stress coping strategies, such as seeking support, acceptance, or positive reevaluation, showed a decrease in PTSD. Similarly, in the case of post-traumatic development, strategies focused on positive growth, such as active coping, planning, seeking support, and positive reevaluation, had a significant impact on its increase. It is worth noting the significant relationship between post-traumatic development and the use of avoidance strategies, primarily resorting to religion and a sense of humor. This means that in the examined group of nurses, both reducing the intensity of PTSD and, on the other hand, increasing post-traumatic development were influenced by resorting to constructive coping strategies in difficult situations.

Considerable attention is given to the significant role of support as a protective factor against the intensity of PTSD symptoms and reinforcing post-traumatic growth. Our own research indicates that a higher level of perceived support significantly influenced a reduction in the intensity of PTSD symptoms. The received support also visibly influenced a higher level of post-traumatic development. Most respondents declared receiving support while performing professional duties, with 12.87% strongly agreeing and 43.56% rather agreeing. However, almost half of the respondents indicated a lack of support. The most commonly mentioned sources of support were family and close ones, nursing colleagues, supervisors, and society, but no one mentioned the employer.

The obtained results align with data presented in the literature, highlighting negative associations between support and PTSD symptoms among medical personnel and positive associations in post-traumatic development [21,23]. However, it is essential to emphasize the particular role of support during the COVID-19 pandemic.

According to research by Buchelt and Kowalska-Bobko, employers supported nursing staff during the pandemic. Nurses considered organizational and material measures as positive actions, including ensuring epidemiological safety (75%), the possibility of COVID-19 testing (53%), providing accommodation (39%), good work organization (34%), and facilitating family contacts (30%). However, in the emotional sphere, crucial for recognizing and mitigating PTSD intensity and strengthening post-traumatic development, only 17% of nurses indicated that they were provided with opportunities for psychological assistance. Nurses stressed the importance of proper personal protective equipment and a positive work atmosphere with support from superiors and employers during the pandemic. Buchelt and Kowalska-Bobko suggest that nurses should have continuous access to psychological assistance [12].

Conclusions

The COVID-19 epidemic negatively impacts emotions among nursing staff, causing stress and eliciting feelings of helplessness, fear, and anger.

Half of the surveyed nurses show at least moderate or high intensity of post-traumatic stress disorder (PTSD) symptoms, which most commonly manifest in arousal and reactivity, as well as avoidance.

Among the stress coping strategies most frequently utilized by surveyed nurses are active coping and diverting attention to something else.

The intensity of PTSD symptoms significantly positively correlates with blame or distraction strategies from the stressor by engaging in something else, denial, discharge, cessation of actions, or resorting to alcohol.

Positive post-traumatic development is significantly reinforced by strategies focused on positive growth, such as active coping, planning, seeking emotional and instrumental support, and positive reevaluation.

The most common sources of support for nurses are family, close ones, and nursing colleagues. However, almost half of the nurses indicate a lack of support. Emotional support was the most expected and received type of support, followed by informational support.

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CIVIL LIABILITY FOR A NURSE'S MEDICAL FAULT. SELECTED ISSUES[2].

Abstract:
This argument is a comparative study of liability for a medical fault committed in the performance of a nurse's work. The work is a consideration of a theoretical-dogmatic nature, based largely on the provisions of Polish legislation. The interest in the chosen topic of medical fault is considerable due to the broad basis for independent liability in both civil law, criminal law and disciplinary form. Due to the considerable complexity of the activities, decisions and actions entrusted that characterise the nursing profession, practitioners are exposed to a real risk of error, and therefore the issue indicated has become the apex for the present analysis of the selected type of liability - civil legal.

Keywords:
medical fault, financial liability, adverse behaviour, claim.

The aim of this paper is to attempt to introduce and characterise collectively the issue of civil liability for a nurse's medical fault using current legislation and literature.

In order to analyse the leading theme, it is first necessary to introduce and systematise the basic concepts for looking at the indicated topic. It is worth considering the basic definition of " medical fault ", medical malpractice" or "medical malpractice". The scope of the term is nominated by the words used in it, the terms are often used interchangeably, treating them as synonyms. They

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are colloquially used depending on whether they refer to an alleged error by a doctor or medical personnel. As a general rule, everyone in the medical profession is at risk of making a medical/ medical fault, not in every case it may be a medical/medical malpractice fault, because, not all medical professionals are doctors, but every doctor represents the medical profession [1]. However, for the purposes of this paper, I believe it is appropriate to approximate the theory of PhD R. Kędziora which suggests as the broadest concept, indicated for use in contemporary literature, the term " medical fault " in relation to a wider number of designators and " medical fault " in relation to an error committed by a doctor. He also points out that the possible interchangeable use of the term "malpractice" results from the archaic formulation of the subject matter, which has been established over the years by judicature, legal language and public awareness. The indicated norms do not have a legal definition contained in the current legislation, while the legislator, introduced a broader concept in Art. 3 ust. 1 pkt 1) Act o Prawach Pacjenta i Rzeczniku Praw Pacjenta [2] (uppirp). Namely, a 'medical event', and according to the statutory definition it is *occurring during or as a result of the provision or nonprovision of healthcare:*

a) *infection of a patient by a biological pathogen,*
b) *personal injury or disorder of the patient, or*
c) *death of the patient*

- *which could have been avoided with a high probability if the healthcare service had been provided in accordance with current medical knowledge or if another diagnostic or therapeutic method had been used, unless there was a foreseeable normal consequence of the use of a method to which the patient had given informed consent*[2].

The literature abounds with a multitude of more or less elaborate definitions, but from the point of view of this study it is worth quoting the concept proposed by PhD P. Zielińskiego, who held that "a medical fault is an act or omission of a medical professional that is incompatible with the current state of medical knowledge and practice, committed against a patient inadvertently, in the process of providing him with health services"[3]. In addition, it should be noted, the dispute in the doctrine, which suggests different classifications of medical faults. Universally typology distinguishes four types of errors: diagnostic, therapeutic, technical and organizational error. At the same time, for the purposes of this brief work, it should be briefly assumed that diagnostic error and therapeutic error are predominantly related to the process of performing treatment services contrary to accepted norms, behavior and medical knowledge. In contrast, technical error and organizational error usually result from violations of the rules of prudence, knowledge, negligence or mistake [4].

Most importantly, the mere occurrence of a medical fault is not sufficient for the occurrence of civil liability, which is essentially property liability. For the occurrence of liability for damages resulting from a medical fault, it is necessary that there be a so-called logical sequence of cause and effect. The literature on the subject shows that it happens that a patient considers as a medical fault a different result of the nursing services provided to him than the one he expected. It is impossible not to point out that an unfavorable result, can be caused by the inability to prevent adverse effects on the health or life of the patient, it is not necessarily the result of inadequate action of medical personnel. Many times, for objective reasons that lie beyond the causal capacity and current knowledge of even the most experienced and professional nurses.

Liability of a nurse for a medical fault nominates the occurrence of three absolute prerequisites altogether [5]:

- *first, there must be a harmful event nominating liability in the form of a tort or a failure to perform or improper performance of an obligation incumbent on the nurse in this case,*
- *second, there must be an injury of a pecuniary (personal or property) or non-pecuniary (non-material) nature;*
- *third, there must be a normal (adequate) causal relationship between the event and the resulting damage* [6].

Fundamentals of the employment and responsibility

The guiding principles for the practice of the profession by nurses are determined by the Act o zawodach pielęgniarki i położnej dated 15 lipca 2011 r [7]. It is a rule from the Act that the nursing profession is an autonomous medical profession. Significantly, the aforementioned independence of the nursing profession constitutes the various forms in which it provides its services, pursuant to Art. 19 ust. 1 Act o zawodach pielęgniarki i położnej:

- on the basis of an employment contract,
- on the basis of an employment relationship,
- on the basis of a civil law contract,
- within the framework of voluntary work,
- within the framework of professional practice.

It is the form of employment that determines the type of liability incurred by the nurse for any medical fault he or she may commit.

In practice, nurses carry out doctor's orders, but on the basis of the Regulation of the Minister of Health of 28 February 2017, there is a wide range of activities listed as a closed catalogue that they can carry out on their own without a doctor's order, based on their own competence and as a result of making their own decisions.

According to practice, the most common form seems to be the employment contract. Such an employment relationship nominates the liability of the treatment facility in the first instance for any medical fault of the nurse. Importantly, however, the medical establishment that incurs liability to cover the damage caused by the error has a 'recourse claim' against the nurse under Article 441 of the Civil Code (k.c.) for the damage to the property it was forced to cover as a result of the nurse's breach or failure to fulfil the imposed employment duties [8]. From the provisions of Art. 119 kodeksu pracy (k.p.) [9] implies a limitation of the amount of the potential claim provided that the indicated error was unintentionally caused, in which case the employer may claim on the basis of the said recourse from the nurse the amount he paid to, for example, the patient or the patient's family. However, the nurse's repayment may not exceed three months' salary. In the case of intentional damage, the provision indicated does not apply, and therefore there is no limitation on the amount of the employer's property damage liability under Art.122 k.p. the nurse is liable for the costs up to the actual payment made by her employer in the first place. Therefore, ultimately, the liability of the contracted nurse is of an employee nature as the employee bears the financial consequences resulting from the damage to the employer's property, but in most cases, due to an unintentional error, the liability is limited.

In the situation of the provision of work by a nurse as interpreted by the Art. 33 Act date 15 kwietnia 2011 r. o działalności leczniczej (dalej u.dz.l.) in the framework of the individual practice of a nurse exclusively in a medical establishment on the basis of an agreement with the medical entity operating that establishment or in the individual specialised practice of a nurse exclusively in a medical establishment on the basis of an agreement with the medical entity operating that establishment. Any liability for damage arising from the unlawful performance or non-performance of health services by the nurse shall be borne jointly and severally by the healthcare provider and the nurse party to the contract. These contracts are civil law contracts, the essence of which is generally defined in Article 734 of the Civil Code. In the case of these contracts, unlike an employment contract, the contractor does not perform his work under the direction of the principal. A civil law contract is work on one's own account, which also nominates a different way of responsibility for a wrongful act on one's "own account".

The nursing profession is a job with great responsibility and risk, not only in the sense of having power over human life, but also the consequences incurred for possible deviations from the norms of behaviour prescribed by law and knowledge or expectations. This short study aimed to address a polemic on an extremely important topic concerning the types of responsibility indicated in selected aspects and the differences between their bases. Due to the complexity of the subject matter and the number of types of actual liability of the nurse, this study provides an impulse to deepen the consideration of the complex legislation.

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