# STRESS, EMOTIONS AND ANXIETY DUE TO THE DEATH AMONG NURSES

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Białystok 2019

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Medical University of Białystok

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*Happiness is not the absence of problems; it's the ability to deal with tchem*

*Steve Maraboli*

*Dear Colleagues*

Nursing is a profession in which nurse needs not only to has reliable medical knowledge but also to has a high resistance to stressful situations.

In their work, nurses experience contact with death much more often than others, which is why they may be more exposed to the destructive effects of negative emotions (including anxiety), not only in such circumstances as e.g. the first contact with death, establishing positive bonds with a sick person, young dying patient's age, short work experience, but also the death of a loved one recently

Recently, interest in the occurrence of stress in the work of nurses has increased, because this professional group is exposed to various stressors associated with saving patients' lives.

The above may negatively affect the performance of nurses' duties and lead to so-called stress transmission. Factors generated by the work may negatively affect the family life of nurses

Negative emotions of the medical staff hamper, and sometimes even prevent, the implementation of daily professional activities, especially regarding chronically ill and dying people.

As editors of the monograph and authors of individual chapters, we hope that it will contribute to convincing the competent instances that it is advisable to check in the health care facilities measures to reduce stress at work and to learn to deal with negative emotions, that research should be conducted and programs should be created for nurses whose goal will be to teach them how to reduce anxiety and depression over the death of patients. We think that this monography is important to define the emotion control indicator, which means the individual's subjective belief in the ability to control their reactions.

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## LIST OF SHORTCUTS

| | |
|---|---|
| **ACZ** | distraction seeking |
| **AOS** | avoidance-oriented style |
| **CECS** | The Courtauld Emotional Control Scale |
| **CISS** | The Coping Inventory for Stressful Situations |
| **D** | including distraction |
| **EOS** | emotion-oriented style |
| **EU-OSHA** | The European Agency for Safety and Health at Work |
| **GHQ A** | somatic symptoms |
| **GHQ B** | anxiety, insomnia |
| **GHQ C** | social dysfunction |
| **GHQ D** | symptoms of depression |
| **GHQ-28** | The General Health Questionnaire 28 |
| **HCV** | *Hepatitis C Virus* |
| **HIV** | Human Immunodeficiency Virus |
| **INTE** | Emotional Intelligence Questionnaire |
| **PKT** | social diversion |
| **SD** | social diversion |
| **SOC-29** | The Sense Of Coherence Questionnaire |
| **SSE** | emotion-oriented style |
| **SSU** | avoidant style |
| **SSZ** | task-oriented style |
| **STAI** | The State Trait Anxiety Inventory |
| **TOS** | task-oriented style |
| **UV** | ultraviolet radiation |

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# Selected aspects of psychosocial risks in the workplace of nurses

*Halina Kalandyk, Agnieszka Kułak-Bejda, Grzegorz Bejda, Magdalena Lech, Elżbieta Krajewska-Kułak*

## Introduction

*Never stop learning because*
*Life never stops teaching [1]*

The issue of safety and negative effects of work has already been noticed by Hippocrates (460-377 B.C.), who argued that "*there are many crafts and arts that bring people dealing with them, many plagues and suffering*" [cited in 2]. A threat at the workplace is considered to be: "*the state of the working environment that can cause an accident or illness (these can be objects, substances, devices, machines, working methods, work environment or other aspects of work organization)*" [3]. In contrast, the occupational risk is: *"the likelihood of adverse events related to work performed, causing losses, in particular, the occurrence of adverse health effects in employees as a result of occupational hazards in the work environment or the way the work is performed"* [3].

The level of risk of an occupational hazard, after Jethon [4] depends on:

- the presence of an appropriate factor (its physicochemical properties, bioavailability, invasiveness, damaging potential)
- the circumstances of the exposure (doses, the intensity of exposure, co-existing factors, exposure time)
- the number of sensitive people.

The European Agency for Safety and Health at Work (EU-OSHA - *The European Agency for Safety and Health at Work*) [5] distinguishes five stages of occupational risk assessment:

- I - identification of threats and identification of persons at risk
- II - assessment of risk types and sorting them by the importance
- III - taking a decision on preventive action
- IV - taking action
- V - monitoring and review.

One of the professional groups exposed to a number of occupational hazards is nurses, which is associated with their daily duties, the risk of contact with harmful factors, as well as numerous psychosocial burdens.

In the literature on the subject [4,6-13], factors that may occur in the workplace of the nurse are divided into:

- dangerous - which can potentially threaten accidents at work (e.g. movable equipment and mechanisms, elements of technical devices, protruding elements, blades, sharp edges)

  harmful-threatening to occupational disease:
- physical (electromagnetic field, ionizing, infrared and laser radiation, UV, noise, vibration, hot and cold microclimate)
- biological (HBV, HCV, HIV, cellular microorganisms, internal parasites, cell-free units capable of replication or transferring genetic material, internal parasites)
- chemical compounds (related to chemotherapy, research reagents, anesthetic gases, agents used for disinfection, sterilization and latex)

or on [4,6-13]:

- dependent on the working environment - resulting from diagnostic and therapeutic procedures conducted, contact with cleaning agents, related to poor work organization and conditions of stay at the hospital (e.g. the so-called poor construction team)
- resulting from contact with the patient
- related to mutual relations between employees of a given healthcare institution.

## Psychosocial risks

*Just 3 keys to enjoy Life CTRL+ALT+DEL*

*1. Control yourself*

*2. Look for Alternative solutions*

*3. Delete the situation which gives you tension [1]*

The result of the high psychological burden of nurses while performing work is personal involvement in the affairs of patients, directly related to the specifications of the profession. The health condition of each employee depends primarily on their ability to cope with stressful situations.

The quality of fighting stressful situations mostly depends on the perception of yourself and your potential options, in the context of a particularly stressful situation [14].

Occupational stress [cited in 15, cited in 16], this is a lack of mutual adaptation between the employee and his work environment. At work, a nurse may be the result of fatigue, excessive psychophysical burden, making many difficult decisions, and acting under time and deadline pressure [15,16].

Bilski and Sykutera [13] are the main stressors in the work environment of nurses consider:

- no clear job evaluation criteria• insignificant participation in decisions regarding working conditions
- specificity of work-related loads (shift work, availability, rigid hours of employment, emergencies and accidents, contact with death, on-call monotony, rush)
- low prestige of the profession
- overwork
- the need to earn extra money, low earnings
- moral problems
- sense of responsibility for the patient
- constant confrontation with the loss of the most important values (health, life).

As a result of chronic stress, various somatic pathologies may develop, including hypertension, ischemic myocardium, stroke, digestive system disorders, musculoskeletal disorders, depressive and neurotic disorders, sleep disorders and reduced immune resistance leading to viral diseases, bacterial, degenerative, as well as cancerous [13].

Resents studies [15,16] show that stress at work of Polish nurses reaches a definitely higher level than in many other countries, and its main sources are:

- level of satisfaction with job prospects
- high quantitative requirements
- minimal possibilities of influencing work and own development
- huge job insecurity.

Night and shift work intolerance syndrome [15,16] may be manifested in sleep disorders, chronic fatigue, cardiovascular ailments (coronary artery disease, hypertension), gastric ailments (gastrointestinal disorders, gastric ulcer), increased consumption of coffee, alcohol, sedatives, disorders of social functioning, reduction of overall life satisfaction, decreased quality of sexual life, depression, symptoms of burnout, psychoneurotic disorders and acceleration of aging processes. Hoffman and Scott [17] showed that working in an 8-hour system is less stressful for nurses than working in a 12-hour system. Canadian scientist Hans

Selye, a professor at the Institute of Medicine and Experimental Surgery of the University of Montreal, described stress as the sum of all the untamed effects of various factors that can affect the system. Biological stress is, therefore, a non-specific reaction of the body to all the tasks assigned to it [cited in 18]. It is worth remembering that stress as an emotional state is often an unpleasant and disorganizing experience. As an indicator of stress, disturbances in human behavior can be considered, especially in the performance of activities that undergo normal conditions, can be considered. Stress is a result of danger, but it also becomes a factor threatening man's countermeasures, increasing demands on them. In turn, deterioration in performance of activities - can be a secondary source of stress. So there is a feedback effect of stress and coping with it [19].

It is worth mentioning that nurses often meet in their work with patients who are negative, claim-based, and their expectations on their part can be ambivalent and more and more often they require staff to be able to support their spirits and reduce anxiety. The mental burden of nursing staff is also associated with the need for constant concentration of attention, focus on quick response and quick decision making [20].

Stress is also favored by daily contact with illness and death, which "mixes" with powerlessness and hope, and this consequently leads to mental stress and can also lead to alcohol and / or sedative abuse [20].

Nursing also involves the need for shift work, which on the one hand is not conducive to well-being and work efficiency, and on the other hand causes a disturbance in the functioning of the biological clock and an increase in the likelihood of professional errors [20,21]. The nursing profession is undeniably a stressful profession, and representatives of this profession often tend to accumulate negative emotions [12]. The nursing profession is undoubtedly a stressogenic profession, and representatives of this profession often show a tendency to accumulate negative emotions [22]. In turn, increasing stress causes varied, specific and non-specific changes in the human body that occur [22,23].

People use various mechanisms to overcome stress, minimize or avoid it, and finally change the situation to less stressful [23].

Coping with stress has two functions [24]:

- instrumental (task-oriented) - problem-oriented, that is to improve the relationship of the subject with the environment
- self-regulation of emotions - usually consisting in reducing unpleasant tension and alleviating other negative emotional states.

Mental stress is a special kind of relationship between a person and the environment that affects the mental state of an individual. In the case of nurses, their emotions are often associated with the patient's behavior, his suffering, fears, gratitude, grievances and a number of other weaker or stronger feelings. In their professional situation, they also experience contact with death more often than others, and are therefore more exposed to the destructive effects of negative emotions than the general population [25]. Skorupska-Król et al. [26], in a study conducted in a group of nurses, showed that the emotions that accompany the practice of nursing reduce the sense of satisfaction with the work performed and negatively affect the quality of care provided.

As already mentioned, long-term stress is a factor negatively affecting the human psyche. This is due to the fact that each person has a certain ability to bear loads and cope with them. Too high loads always disturb the internal and external balance. It should be remembered that resistance to stressful factors is an individual disposition, depending on the properties of the nervous system, the immune forces of a given person. The social situation plays a big role, including relationships with other people and support from them [27,28].

## Violence, aggression, mobbing

*Start the day with a smile!*

*It irritates people [1]*

For many years, the problem of aggression in health care facilities in Poland, as emphasized by Kowalczuk et al. [15], was a taboo subject, however, for several years there has been a growing interest in this problem. According to the European Commission, after Drabek et al. [29], workplace aggression is *"... all those situations in which an employee is insulted, intimidated or attacked in work-related circumstances and this directly or indirectly threatens his safety, well-being, and health"*. The perpetrator of aggression can be a person from outside the workplace (patient, his family), but also people cooperating, at various levels of professional dependence (colleague, colleague, supervisor) [15].

Neuman and Baron [30] identified several groups of aggressive behavior in the workplace:

- manifested hostility, manifested in a raised voice, the use of profanity, offensive gestures, comments, threats, unreasonable, excessive and unfair criticism of work, dissemination of false information about the victim

- intentional obstruction of work (obstructive), manifesting itself in the deliberate slowdown of the team's work, being late to meetings, postponing task performance, concealing important information and other,
- overt aggression manifested in physical aggression, verbal threats, insults in the presence of others (patient, colleague), blackmail.

The European Foundation for the Improvement of Living and Working Conditions (EFILWC) conducted a survey in the form of individual interviews with 21,500 employees throughout the European Union, which showed that violence at work leads to a worsening of the health of those affected [30]. It was found that 40% of employees exposed to physical violence, 47% of employees exposed to psychological harassment, and 46% of employees exposed to sexual harassment [30].

The word mobbing [31] derives from the English verb "*to mob*", which means "*to harass, attack, accost*" and was first described in an environment of people working in the early 1980s by Heinz Leymann. In Polish legislation, the term "*mobbing*" exists as "*structured psychological violence in the workplace*" [cited in 15]. The research of Kurzecka et al. [31] shows that the environment which is particularly vulnerable to this phenomenon is health care. According to the authors [31], "*mobbing is a long-term systematic harassment, intimidation of an employee, ridiculing him, causing him an underestimated assessment of professional suitability. It is a multi-phase process in which the mober (stalker) uses manipulation methods ranging from the most subtle and imperceptible by the victim to the most drastic, causing a sense of harm, powerlessness, rejection, self-depreciation. It can lead to isolation from colleagues and even complete elimination from the team*."

Mobbing is also the use of economic, psychological and social violence to humiliate, intimidate and limit work capacity [31]. Mobbing can cause severe stress, physical and mental illness. It is believed that most often people with the shortest seniority and higher education are exposed to mobbing behavior in the situation of threat to the professional position of the immediate superior [31].

## Burnout syndrome

*Do what you feel in your heart to be right, for you will be criticized anyway.*
*You will be damned if you do and damned if you do not.*
*Eleanor Roosevelt, first lad [1]*

Another problem at work, which is associated with constant mental and physical stress, is the so-called chronic fatigue syndrome and so-called "Occupational burnout". In English literature, this group of professions is referred to as human service professions or, in short, helping professions [32].

Professional burnout syndrome, according to Tucholska [cited for 16], "*develops as a result of interaction between the work environment (high requirements, low impact, low support) and individual personality traits (biological susceptibility to stress combined with the ability to build social relations and create a supportive environment, with tolerance of frustration and possibilities cognitive* ".

According to Maslach and Goldberg [33], occupational burnout "*is the result of a mismatch associated with excessive work load, lack of control and decision-making as to the roles performed, insufficient pay, lack of justice, as well as experiencing conflicts values* ".

Olley's research [34] conducted in a group of 104 nurses, 83 doctors, 21 pharmacists, 10 social workers and 42 nursing aids, showed that burnout occurs in a larger scale compared to other professional groups. In the literature [35,36,37], surgical, pediatric, psychiatric and oncological nurses are considered to be the most exposed to occupational burnout.

Burisch, after Fengler [32], distinguishes several stages of the development of occupational burnout, which are not always consecutive:

- warning signs of the initial phase (reduced exposure to patients, their families, friends, colleagues, larger claims)
- emotional reactions, guilt (depression, aggression)
- breakdown
- shallow
- psychosomatic reactions
- doubt

It is also possible to return to the earlier phase from the later stage [32]. Negative effects of occupational burnout often spread to other spheres of life and may cause the accumulation of family problems, abuse of alcohol, medicines, drugs and psychological phenomena [16]. In the work of a nurse, occupational burnout syndrome may manifest itself in: loss of feelings and interest in patients, indifference to their emotional states, neglect at work, and even excessive reactions to weak stimuli [32]. Cherniss, as Fengler [32], considers the symptoms of burnout: a sense of failure, anger, helplessness, guilt, isolation, discouragement, withdrawal, a feeling of constant fatigue and exhaustion, a strong reluctance to go to work every

day, and high absence from work. In relation to patients, burnout syndrome can be manifested by: a lack of positive feelings, treating them in a pattern, cynicism, hostility or the inability to listen. It is also important that there is a growing tendency to strictly comply with the rules [32]. Maslach [38,39] reduces burnout symptoms to three main categories:

- emotional exhaustion (powerlessness, lack of energy, weakness, fatigue, irritability, conflict)
- depersonalization (objective treatment of another person, cynicism, indifference, routine, treating the patient as another case, changing care to supervision, avoiding contact)
- reduced professional satisfaction, leading to perceiving yourself as an inefficient, incompetent person, with a sense of lack of achievements and successes, losing the sense of what you are doing.

## Summary

*Human stress resistance resembles a bamboo stalk:*
*at first glance, no one would believe how flexible it is.*
*Jodi Picoult [40]*

Most people experiencing traumatic experiences are shocked by what happened, and some people can come to terms with the situation very quickly and remain emotional calm. Sometimes people affected by difficult experiences feel satisfaction with the way they behaved (e.g., when they participated in a dramatic event, feel euphoria or excitement about the fact that they managed to get out of oppression or could help others. For other people, however, traumatic experiences evoke unusually strong shock and emotional paralysis, which makes them unable to believe what they have experienced. For the next few days after the event, some people may feel lost, feel despair and fear or experience emotions, which in themselves may be unpleasant or disturbing. Depending on the severity or importance of the experience, however, these reactions may take longer than the psychological recovery process can take.

Muraczyńska [41] draws attention to the need to learn to combine compassion and emotional commitment with a distant attitude, as well as to prevent too much empathy in the situation of the patient.

Ogińska-Bulik [42] also indicates the need to introduce empathy training and ways to manage stress among medical staff.

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# Styles of coping with stress and emotions due to the death of a close friend or relative among professionally active nurses

*Andrzej Guzowski, Grzegorz Bejda, Agnieszka Kułak-Bejda, Magdalena Lech, Napoleon Waszkiewicz, Marek Jasiński, Marek Sobolewski, Elżbieta Krajewska-Kułak*

## Introduction

The nursing profession requires adequate preparation, both in terms of medical knowledge, as well as the ability to build interpersonal contacts. It also involves the risk of significant mental strain resulting from personal involvement in patients' problems. According to Bilski and Sykutera [1], the main stressors in the work environment of nurses include:

- a lack of clear criteria for work assessment or support from superiors/colleagues;
- interactions with other people resulting from the need to provide mental support not only to patients, but also their families;
- low earnings and, consequently, the need to earn extra money;
- limited participation in decisions regarding working conditions;
- low prestige of profession; a sense of responsibility for the patient;
- moral issues;
- competition in the workplace;
- the specificity of the demands associated with the held position (availability, shift-work, inflexible working hours; monotony of duties on the ward, haste, urgent and acute presentations, contact with death);
- constant confrontation with the fact of losing the most important values (health, life)
- arduous working conditions (overwork, small staff rooms, no place to rest, overcrowded wards).

Nurses face death in the course of their work more frequently than others, therefore they are more exposed to the destructive effects of negative emotions. They are often exposed to anxiety and destructive effects of negative emotions arising from, e.g., first contact with death, young age of dying patients, forming positive relationships with patients, short work experience, recent death of a close friend or a relative, which may affect the level of anxiety and ability to control emotions.

According to Dziąbek et al. [2], the ability to suppress emotions is considered to be typical of individuals who adhere to established principles, such as nurses, who are obliged to comply with the professional code on a daily basis. According to Sheridan and Radmacher [3], measuring the expression of emotions is particularly significant in the context of studies indicating a correlation between emotional control and different diseases as well as the fact that suppressed emotions exacerbate disease. This tendency is a relatively constant characteristic of highly socialized individuals who strictly adhere to social norms, and an oversuppression of persistent negative emotions leads to neurotic disorders and psychosomatic diseases [4]. Since negative emotions of the personnel make it difficult and sometimes even impossible to implement daily work-related activities, particularly for chronically ill and terminal patients, a number of Western universities has developed programs to reduce anxiety and depression associated with the death of patients [5]. The main aim of the paper was to assess emotional intelligence and style of coping with stress and emotions in response to death among professionally active nurses.

## Materials and methods

The study was approved by the Bioethics Committee of the Medical University of Bialystok (R-I-002/425/2017).

A total of 350 professionally active nurses were included. The study was based on a diagnostic survey using:

- an original questionnaire composed of questions regarding age, place of residence, workplace, professional experience, position held, religion, and experiencing the death of a close friend or relative in the last year
- the Coping Inventory for Stressful Situations (CISS) by Endler and Parker (a Polish adaptation by Szczepaniak, Wrześniewski, and Strelau) for the assessment of stress-coping styles allowing for an evaluation of task-oriented (TOS), emotion-oriented (EOS), and avoidance-oriented style (AOS), including distraction (D) and social diversion (SD). The use of each of the three basic styles is scored between 16 and 80, between 8 and 40 for D and between 5 and 25 for SD [6].
- the INTE Questionnaire by Schutte, Malouff, Hall, Haggerty, Cooper, Gloden, Dornheim (a Polish adaptation by Ciechanowicz, Jaworowska, Matczak) for the assessment of emotional intelligence understood as the ability to identify, understand,

and manage one's own emotions and the emotions of others, as well as to effectively use emotions to manage one's own and other people's actions [7].

The obtained results were analyzed using the chi-square test; Spearman's rank correlation analysis, the t-test for independent samples, the analysis of variance test, the Mann-Whitney test, or the Kruskal-Wallis test, as appropriate.

## Results

A total of 353 professionally active nurses participated in the questionnaire. Respondents aged between 31 and 40 years (29.7%) and between 41 and 50 years (39.7%) predominated. Most respondents were from urban areas (76.8%). Only 23.2% of respondents were rural residents. A bachelor's degree was declared by 23.5% of respondents, and higher education was reported by 10.2% of respondents. Most of respondents were employed in medical treatment units (47.3%) and surgical units (36%) rather than clinics (16.7%). A group with extensive professional experience of 20-30 years predominated (54.4%), followed by nurses with 11-20 years of experience (24.1%), more than 30 years of experience (13.6%), and up to 10 years of experience (7.9%). Unit nurse was the predominant position (63.5%). The nurses were asked about their recent contact with the death of a close friend or relative (within the last year). This was confirmed by 43.3% of nurses, as opposed to the remaining 56.7%. The death of a distant family member or friend was reported by 47.9%, as opposed to 52.1% of respondents. A total of 64.9% of nurses experienced the death of a patient, as opposed to 35.1%.

The CISS was used to assess different individually-dependent stress-coping strategies. The tool allows to evaluate three stress-coping styles:

- task-oriented style (TOS), which involves taking action to manage stress;
- emotion-oriented style (EOS), which is characteristic for those who, when facing stressful situations, focus on themselves and their own emotions, such as anger, guilt, tension;
- avoidance-oriented style (AOS), which is typical of individuals who, when faced with stressful situations, tend to avoid thinking about or experiencing the situation.

The last style may take two forms:

- distraction (D)
- social diversion (SD).

Table I below shows a description of the distribution of all measurements throughout

the study population based on the CISS.

**Table I. Description of the distribution of measures in the entire surveyed population based on the CISS questionnaire**

| **CISS** | | *N* | $\bar{x}$ | Me | *s* | $c_{25}$ | $c_{75}$ | min | max |
|---|---|---|---|---|---|---|---|---|---|
| task-oriented style | SSZ | 353 | 56,2 | 56 | 7,8 | 51 | 62 | 34 | 75 |
| emotion-oriented style | SSE | 353 | 44,9 | 45 | 9,3 | 39 | 51 | 17 | 72 |
| avoidant style | SSU | 353 | 43,6 | 44 | 7,5 | 39 | 48 | 22 | 71 |
| distraction seeking | ACZ | 353 | 17,2 | 17 | 4,4 | 14 | 21 | 7 | 30 |
| social diversion | PKT | 353 | 16,2 | 16 | 3,6 | 14 | 19 | 5 | 25 |

It was found that there were age-related differences in the frequency of using the avoidance-oriented style, particularly its two components, i.e. distraction (p=0.0089) and, though to a lesser extent, social diversion (p=0.0244). The results are shown in Table II.

**Table II. Description of the distribution of CISS questionnaire measurements from the group of 353 respondents**

| **year** | | **20-30 (*N* = 27)** | | **31-40 (*N* = 105)** | | **41-50 (*N* = 140)** | | **>50 (*N* = 81)** | | p |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $\bar{x}$ | *s* | $\bar{x}$ | *s* | $\bar{x}$ | *s* | $\bar{x}$ | *s* | |
| task-oriented style | SSZ | 56,9 | 7,6 | 56,8 | 7,9 | 55,7 | 7,7 | 56,1 | 8,0 | 0,6923 |
| emotion-oriented style | SSE | 46,3 | 10,4 | 45,7 | 9,5 | 44,5 | 8,7 | 44,1 | 9,8 | 0,5401 |
| avoidant style | SSU | 46,6 | 8,4 | 43,8 | 7,4 | 42,4 | 7,1 | 44,6 | 7,8 | 0,0761 |
| distraction seeking | ACZ | 19,0 | 4,3 | 16,5 | 4,4 | 16,7 | 4,1 | 18,3 | 4,7 | 0,0089** |
| social diversion | PKT | 16,4 | 3,8 | 17,1 | 3,2 | 15,6 | 3,6 | 16,1 | 3,7 | 0,0244* |
| **place of residence** | | **sity (*N* = 271)** | | | | **town (*N* = 82)** | | | | p |
| | | $\bar{x}$ | | *s* | | $\bar{x}$ | | *s* | | |
| task-oriented style | SSZ | 56,4 | | 7,9 | | 55,7 | | 7,3 | | 0,5107 |
| emotion-oriented style | SSE | 44,7 | | 9,3 | | 45,0 | | 9,3 | | 0,9213 |
| avoidant style | SSU | 43,7 | | 7,8 | | 43,4 | | 6,9 | | 0,9914 |
| distraction seeking | ACZ | 17,2 | | 4,6 | | 17,1 | | 4,0 | | 0,6796 |
| social diversion | PKT | 16,4 | | 3,6 | | 15,7 | | 3,3 | | 0,0612 |
| **education** | | **medical studium (*N* = 110)** | | **medical highschool (*N* = 124)** | | **higher undergraduate (*N* = 83)** | | **master's degree (*N* = 36)** | | p |
| | | $\bar{x}$ | *s* | $\bar{x}$ | *s* | $\bar{x}$ | *s* | $\bar{x}$ | *s* | |
| task-oriented style | SSZ | 56,4 | 8,1 | 55,1 | 7,5 | 56,5 | 7,4 | 58,8 | 8,2 | 0,1049 |
| emotion-oriented style | SSE | 44,5 | 9,3 | 45,3 | 9,0 | 45,6 | 9,1 | 42,8 | 10,5 | 0,3048 |
| avoidant style | SSU | 43,7 | 7,4 | 43,4 | 8,0 | 43,2 | 7,0 | 44,9 | 7,5 | 0,7461 |
| distraction seeking | ACZ | 17,3 | 4,6 | 17,1 | 4,7 | 17,0 | 3,9 | 17,4 | 4,4 | 0,8936 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| social diversion | PKT | 16,2 | 3,7 | 16,1 | 3,6 | 16,1 | 3,4 | 16,7 | 3,6 | 0,7390 |
| **place of employment** | | **treatment ward (*N* = 127)** | | **a conservative unit (*N* = 167)** | | **time of day (*N* = 59)** | | | | p |
| | | $\bar{x}$ | *s* | $\bar{x}$ | *s* | $\bar{x}$ | *s* | | | |
| task-oriented style | SSZ | 56,3 | 7,4 | 56,1 | 8,1 | 55,8 | 8,3 | | | 0,8154 |
| emotion-oriented style | SSE | 44,4 | 9,5 | 44,9 | 8,8 | 44,8 | 9,2 | | | 0,7141 |
| avoidant style | SSU | 43,4 | 7,4 | 43,0 | 7,4 | 45,1 | 7,7 | | | 0,2965 |
| distraction seeking | ACZ | 17,0 | 4,5 | 16,9 | 4,3 | 17,9 | 4,8 | | | 0,4642 |
| social diversion | PKT | 16,3 | 3,5 | 16,0 | 3,6 | 16,4 | 3,7 | | | 0,8648 |
| **internship in the profession (year)** | | **<10 (*N* = 28)** | | **11-20 (*N* = 85)** | | **20-30 (*N* = 192)** | | **>30 (*N* = 48)** | | p |
| | | $\bar{x}$ | *s* | $\bar{x}$ | *s* | $\bar{x}$ | *s* | $\bar{x}$ | *s* | |
| task-oriented style | SSZ | 58,7 | 8,4 | 55,9 | 7,1 | 55,9 | 8,2 | 57,6 | 7,2 | 0,2924 |
| emotion-oriented style | SSE | 42,4 | 7,8 | 46,2 | 9,3 | 44,1 | 8,9 | 45,2 | 9,9 | 0,1682 |
| avoidant style | SSU | 43,4 | 8,1 | 44,5 | 7,0 | 42,6 | 7,4 | 44,9 | 9,0 | 0,2238 |
| distraction seeking | ACZ | 16,5 | 4,5 | 17,1 | 4,4 | 16,9 | 4,3 | 19,0 | 5,1 | 0,1365 |
| social diversion | PKT | 17,3 | 3,6 | 17,0 | 3,1 | 15,7 | 3,7 | 15,7 | 3,7 | 0,0250* |
| **confession** | | **catolic (*N* = 311)** | | | | **orthodox (*N* = 42)** | | | | p |
| | | $\bar{x}$ | | *s* | | $\bar{x}$ | | *s* | | |
| task-oriented style | SSZ | 56,1 | | 7,8 | | 57,1 | | 7,9 | | 0,3870 |
| emotion-oriented style | SSE | 45,0 | | 9,5 | | 43,6 | | 7,1 | | 0,3856 |
| avoidant style | SSU | 43,7 | | 7,6 | | 42,4 | | 7,1 | | 0,3462 |
| distraction seeking | ACZ | 17,3 | | 4,5 | | 16,6 | | 4,3 | | 0,3014 |
| social diversion | PKT | 16,2 | | 3,6 | | 16,0 | | 3,5 | | 0,8175 |

It can be concluded based on the analysis of the results that distraction was more common among younger and older respondents rather than those in their prime. Education, place of residence, or religion had no effects on the choice of stress-coping style. Professional experience was a factor influencing the frequency of escaping into social life as an antidote to life problems. Social contacts were also more common among nurses with shorter work experience (up to 20 years), compared with other nurses. The results are shown in Table III.

Low levels of SD were observed in 30% of the respondents, including 41.5% who had faced death within the last year, and 61.1% without such experiences. Average SD levels were observed in 31.9% of the respondents, including 42% who had faced death within the last year, and 58% without such experiences. High SD levels were observed in 38.1% of the respondents, including 46.8% who had faced death within the last year, and 53.2% without such experiences.

High levels of social contacts were observed among respondents who had contact with death within the last year (on average 17.0 vs. 15.8, p = 0.0054). These respondents were also slightly more likely to use the avoidance-oriented style, however, the difference was not significant and only close to the level of statistical significance (on average 44.6 vs. 43.0; p = 0.0940). In the case of classification distribution for SD, the difference between the groups was not as pronounced as in the case of exact score measures, but close to the level of statistical significance (p =0.0959). Results are presented in Table IV.

**Table III. Correlations between the components of the CISS questionnaire**

| CISS | task-oriented style (SSZ) | emotion-oriented style (SSE) | avoidant style (SSU) | distraction seeking (ACZ) | social diversion (PKT) |
|---|---|---|---|---|---|
| task-oriented style (SSZ) | 1 | -0,04 (0,4534) | 0,10 (0,0742) | 0,01 (0,8223) | 0,25 (0,0000***) |
| emotion-oriented style (SSE) | -0,04 (0,4534) | 1 | 0,18 (0,0007***) | 0,26 (0,0000***) | -0,10 (0,0528) |
| avoidant style (SSU) | 0,10 (0,0742) | 0,18 (0,0007***) | 1 | 0,80 (0,0000***) | 0,58 (0,0000***) |
| distraction seeking (ACZ) | 0,01 (0,8223) | 0,26 (0,0000***) | 0,80 (0,0000***) | 1 | 0,13 (0,0141*) |
| social diversion (PKT) | 0,25 (0,0000***) | -0,10 (0,0528) | 0,58 (0,0000***) | 0,13 (0,0141*) | 1 |

**Table IV. Description of the distribution of CISS questionnaire measurements depending on the fact of the death of a family member in the last year**

| CISS | | Did a family member die during the year? | | | | *p* |
|---|---|---|---|---|---|---|
| | | yes (*N* = 153) | | no (*N* = 200) | | |
| | | $\bar{x}$ | *s* | $\bar{x}$ | *s* | |
| task-oriented style | SSZ | 56,7 | 7,7 | 56,3 | 7,8 | 0,6853 |
| emotion-oriented style | SSE | 44,2 | 9,3 | 45,2 | 8,9 | 0,3426 |
| avoidant style | SSU | 44,6 | 7,9 | 43,0 | 7,5 | 0,0940 |
| distraction seeking | ACZ | 17,1 | 4,6 | 17,3 | 4,6 | 0,7851 |
| social diversion | PKT | 17,0 | 3,6 | 15,8 | 3,6 | 0,0054** |

We also analyzed the effects of selected factors on the level of emotional intelligence among nurses. Table V presents mean and standard deviation for the INTE Questionnaire in the compared groups. Also, the significance of differences between the groups was evaluated using the Mann-Whitney U test and the Kruskal-Wallis test. As can be seen from the tables below, none of the considered factors significantly differentiated the level of emotional intelligence (the p-value clearly exceeds 0.05 for all comparisons).

An average level of intelligence was observed in 36.5% of the nurses, while a high level was found in 64.5%. Those who had experienced the death of a close relative within the last year showed slightly higher levels of emotional intelligence compared with others (on average 128.5±12.6 vs. 125.5±13.3; p = 0.0624).

The difference between individuals who had experienced the death of a close family member within the last year and other respondents was also noticeable in the dichotomous division into those with average emotional intelligence (40.3% vs. 59.7%, respectively) and high emotional intelligence (45.1% vs. 54.9%, respectively). However, no statistically significant relationship was shown (p = 0.2329).

## Discussion

Nursing is a profession that requires, in addition to reliable medical knowledge, high resistance to stressful situations encountered at work, such as everyday contact with patients who may not always be polite, long work hours, shift work, contact with death, and responsibility for human life. This may have a negative impact on nurses' duties and, according to Plopy [8], result in so-called stress transmission, which is more common in nursing compared with other professions. The family life of nurses is affected by factors generated by the work environment, which cause a deterioration of relationships with children and spouses, such as anger, frustration, anxiety, a sense of helplessness, and physical exhaustion. In the case of significant involvement in professional duties, a social role conflict may occur, i.e. an internal conflict experienced by a person who is devoted to an important professional role, but at the same time neglects family responsibilities [8]. Therefore, the ability to cope with emotionally difficult situations seems important. Several stress-coping styles can be distinguished [9-12]. The task-oriented style focuses on the stressor and involves activities aimed at learning about and overcoming difficulties by changing one's own behavior or the environment. The emotion-oriented strategy is focuses on feelings elicited by the stressor and involves reducing negative emotional tension, while the avoidance-oriented style is associated with involvement in substitute activities and search for social support. Basińska and Andruszkiewicz [13] investigated stress-coping strategies and experiences related to work among 150 nurses from surgical, internal and intensive care units. They found that the nurses did not differ in terms of the used coping strategies depending on which ward they worked [13]. Perek et al. [14] analyzed stress-coping styles among 108 pediatric nurses. When faced with difficult situations, they used constructive methods for coping with stress, which involved making an effort to solve

problems through cognitive transformations or attempts to change the situation. Age and work experience had a significant impact on the emotion-oriented stress-coping style. The emotion-oriented style increased with decreasing age, whereas the emotion-oriented strategy decreased with increasing work experience [14]. Grochowska et al. [15] included 101 pediatric nurses in their study and found average and high stress levels among these respondents. The nurses most often chose active stress coping and planning as a stress-coping strategy [15].

Our study showed age-related differences in the frequency of the avoidance-oriented style, with distraction being more common among young and older respondents. Education, place of residence, workplace, or religion had no effects on the choice of problem-solving strategy. Social contacts were a more common strategy among nurses with shorter work experience (up to 20 years).

According to Dziabek et al. [2], the nursing profession requires mental resilience, resistance to stress, and the ability to cope with difficult situations. Wilczek-Różyczka and Rzepka [16] point to a situation when a doctor and a nurse are unable to cope with their own negative emotions, fatigue, and strain as a result of close interaction and confrontation with suffering, death, and chronic stress. In our study, more respondents with a high level of social contacts were identified among those who had had contact with death within the last year.

It is likely that stress associated with a new environment, a sense of lack of competence, and the process of professional role adaptation promote a phenomenon referred to by Humpel and Caputi [17] as self-doubt, which is typical of young, professionally inexperienced nurses, who do not trust their own knowledge and skills. According to Lazarus (as cited in [18]), emotional life is shaped by people's assessments of external events and methods of coping with these events. Assessments, strategies of coping in difficult situations, and emotions result from individual differences in the hierarchy of goals and beliefs about oneself and the world. In turn, the type of experienced emotions and the way of responding to stress have a significant impact on mental and physical health (as cited in [18]). Rybakiewicz [19] emphasizes that it is important to determine the emotional control indicator measuring the subjective conviction of an individual about their ability to control their reactions. This *"control does not mean that an individual attempts to respond in the same positive way every time. True control is the possibility to choose emotional reactions. It depends on the ability to make decisions and a belief in the rightness of the choice"* [19].

The life of a patient often depends on the mental and physical health of nurses [20]. Andruszkiewicz [21] found that a group of 242 nurses differed from the sample of other Polish

women in terms of their professional engagement (nurses had a greater ability to distance themselves from professional problems) and their emotional attitude towards work (nurses had a lower sense of professional success and were less satisfied with life). However, they did not differ from the nationwide sample of women in terms of mental resilience and strategies to cope with problems [21]. Emotional experiences accompanying work determine effective coping with work-related problems, while profession-related mental strain mainly affects the emotional sphere. Emotional intelligence is the ability to identify and manage one's own emotions and the emotions of others, and is associated with self-awareness, self-control, motivation, empathy as well as social and communication skills [22,23]. Majerníková and Obročníková [24] included 86 students in their study and showed that nursing students scored higher for emotional intelligence in all areas apart from self-control compared with the average score of the rest of society. Students whose previous education was not related to health scored higher for Emotional Abilities [24].

In our study, 36.5% and 64.5% of the respondents showed average and high intelligence levels, respectively. Slightly higher emotional intelligence levels were shown by those who had faced the death of a close family member within the last year.

Goleman [25] found that emotional intelligence is not strongly associated with race, social class, education, or social status. Bar-On (as cited in [23]) found that individuals with high emotional intelligence are able to adapt to stressful situations more easily and quickly.

This was confirmed in our study, which demonstrated that age, education, place of residence, work experience, position held, and religion had no statistically significant effects on emotional intelligence levels.

Individuals characterized by high emotional intelligence are considered to be willing to devote their time and energy to others [25,26]. When faced with stress, they usually choose active forms of coping. Emotionally intelligent people know and control their emotions, are able to read the emotions of others and appropriately respond to these emotions, they are usually successful and able to cope well in work-related situations (Goleman 2016; Salovey, Mayer, Caruso 2004). Individuals with low emotional intelligence are very critical and act reserved towards others. When faced with stress, they mostly use avoidance-oriented strategies, such as distraction, denial, exclusion of the "I" from the situation, or a cognitive block [24,26].

In (year), Salovey et al [26] found that every person is able to learn the basics of emotional intelligence; therefore, its seems that the development of emotional intelligence, e.g., by organizing training workshops, may prove beneficial for both nurses and patients.

## Conclusions

1. The choice of stress-coping strategy was influenced by age rather than education, place of residence, workplace, or religion.
2. Age, education, place of residence, workplace, work experience and duration, and religion had no statistically significant impact on emotional intelligence level.
3. High levels of social contacts and slightly higher emotional intelligence levels were more common in the group of respondents who had had experienced death within the last year.

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# Life orientation and mental health in professionally active nurses in the context of their contact with the death of a close relative

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## Introduction

When analyzing the fate of Jews who survived the concentration camps, Aaron Antonovsky [1] noted that some of them, despite regaining their freedom, remained apathetic and embittered, succumbing to disease and dying a few years after liberation. Others, remained optimistic, cheerful, and often lived a long and happy life, despite similar experiences and the damage to their health. Searching for the answer to the question: what determines the fact that some people maintain their health and live a long life while others are more prone to disease and live shorter, he formulated the concept of salutogenesis, in which the most important concept is the sense of coherence [1].

Antonovsky [1] explains the sense of coherence as the overall orientation of man, expressing the degree to which one has a dominant, persistent, but dynamic sense of certainty that the stimuli that flow from the internal and external environment throughout life are of a structured, predictable nature; that there are resources available that will allow one to meet the demands of these stimuli and these requirements are a challenge worth the effort and commitment. The author distinguishes three dimensions of the sense of coherence. The first, comprehensibility, is the perception of incoming information as understandable, orderly, consistent, and clear, making cognitive sense. It is the conviction that the stimuli that a person will encounter in the future will be predictable, and even if they appear unexpectedly, then at least it is possible to organize and explain them. People with a strong sense of comprehensibility have the ability to accurately assess reality and the development of events does not surprise them. The second, manageability, is the perception of resources available to the individual, which allow him/her to meet the expected requirements. People with a strong sense of manageability know that whatever happens, they can cope with a difficult situation, either alone or with the help of other people. The third, meaningfulness, is the feeling that there are

important areas of life that are worth the emotional commitment, sacrifice, and energy. People with a strong sense of meaningfulness perceive life or its selected spheres as important, i.e. those in which action is taken and investing effort makes sense. A sense of meaningfulness is an emotional and motivational dimension of the sense of coherence [1].

The main aim of the study was to assess correlations between professionally active nurses' sense of coherence and mental health status as well as their contact with death.

## Materials and methods

The study was approved by the Bioethics Committee of the Medical University of Bialystok (R-I-002/425/2017).

The study included 350 professionally active nurses and used the diagnostic survey method, using:

- an original questionnaire composed of questions regarding age, place of residence, workplace, duration of professional experience, position held, religion, and experiencing the death of a close friend or relative in the last year.
- The Sense Of Coherence Questionnaire (SOC-29) by Antonovsky (Polish adaptation by the Department of Clinical Psychology at the Institute of Psychiatry and Neurology in Warsaw, the Department of Psychoprophylaxis at the Adam Mickiewicz University in Poznan, and the Department of Health and Work Psychology at the Nofer Institute of Occupational Medicine in Lodz, 1993) enables estimating the overall sense of coherence (SOC), and in three dimensions: comprehensibility, manageability, and meaningfulness. The SOC-29 questionnaire consists of 29 questions, with seven possible answers for each question, scored from 1 to 7, respectively. The total level of coherence is calculated (29-203 points), and the questions are grouped into three subscales, describing: the levels of comprehensibility (11 statements – 11-77 points); manageability (10 statements – 10-70 points); and meaningfulness (8 statements – 8-56 points). It is believed that healthy and well-functioning people achieve an overall coherence level of around 120-130 points. In the interpretation, coherence is differentiated into low (up to 116 points), average (117-156 points), and high (from 157 points). [1].
- The General Health Questionnaire 28 (GHQ 28) by Goldberg (Polish adaptation by Makowska, Merecz) enables identifying people whose mental state has deteriorated temporarily or in the long-term a result of experienced difficulties, problems, or as

a result of mental illness as well as people with a significant risk of mental health disorders. In addition to the general score, the GHQ-28 version has four subscales: somatic symptoms (GHQ A); anxiety, insomnia (GHQ B); social dysfunction (GHQ C); and symptoms of depression (GHQ D). The four components of the GHQ-28 measure can have values from 0 to 7 points, and the total measure from 0 to 28 points. The higher the values, the worse the respondents' psychological well-being [2,3].

The results were analyzed using the chi-square test for independence; Spearman's rank correlation analysis, the t-test for independent samples, the analysis of variance test, the Mann-Whitney test, or the Kruskal-Wallis test, as appropriate.

## Results

The questionnaire study was conducted in group of 353 professionally active nurses. Respondents aged between 31 and 40 (29.7%) and between 41 and 50 years old (39.7%) predominated. Those aged 20-30 years constituted 7.7%, and those over 50 years 22.9%. Most respondents in the studied population resided in urban areas (76.8%). Only 23.2% were rural residents. A total of 31.2% of the respondents were graduates of medical vocational school., and 35.1% of medical high school. A bachelor's degree was declared by 23.5%, and higher education was reported by 10.2%. Most respondents were employed in medical treatment units (47.3%), and then surgical units (36%), and the least in clinics (16.7%). People with extensive professional experience, working 20-30 years, dominated in the surveyed population (54.4%). The next largest group consisted of people with 11-20 years of work experience (24.1%), then those working over 30 years (13.6%), and the smallest group worked 10 years or less (7.9%). Unit nurse was the predominant position in the studied population (63.5%). Then, 17.8% of the respondents worked as ward or coordinating nurses, while 18.7% as serology, infection control, community, school, dispatcher, emergency room or surgical nurses. In the assessed population, adherents of the Catholic religion (88.1%) predominated, followed by Eastern Orthodox (11.9%). the nurses were asked about contact with the death of a close friend or relative within the last year. In this time period, 43.3% of nurses had a death of a close relative, while 56.7% did not. The death of a distant family member or friend was reported by 47.9%, as opposed to 52.1% of respondents. A total of 64.9% of nurses experienced the death of a patient, while 35.1% did not.

The distribution of coherence measures in the studied population is presented in Table I. Mean overall sense of coherence was 130.2±23.3. Most of the surveyed nurses (60.3%) had

an average level of coherence. Mean sense of comprehensibility was 43.5±9.5; manageability 46.3 ± 9.0; and meaningfulness 40.4±8.3.

**Table I. Distribution of coherence measures in the total studied population**

| **Level of coherence (SOC-29)** | *N* | $\bar{x}$ | Me | *s* | $c_{25}$ | $c_{75}$ | min. | max. |
|---|---|---|---|---|---|---|---|---|
| Comprehensibility | 353 | 43.5 | 43 | 9.5 | 37 | 49 | 16 | 70 |
| Manageability | 353 | 46.3 | 46 | 9.0 | 40 | 52 | 18 | 70 |
| Meaningfulness | 353 | 40.4 | 40 | 8.3 | 35 | 47 | 10 | 56 |
| Overall sense of coherence | 353 | 130.2 | 128 | 23.3 | 116 | 145 | 56 | 193 |
| | | | | | | | | |
| low | 92 (26.1%) | | | | | | | |
| average | 213 (60.3%) | | | | | | | |
| high | 48 (13.6%) | | | | | | | |
| Total | 353 (100%) | | | | | | | |

Age was a factor differentiating the level of comprehensibility in the examined group of nurses. As can be seen in Table II, nurses from the older age groups had a greater sense of comprehensibility.

**Tab. II. Effect of age and place of residence on coherence level (SOC-29)**

| **Age [years]** | **20-30 (*N* = 27)** | | **31-40 (*N* = 105)** | | **41-50 (*N* = 140)** | | **>50 (*N* = 81)** | | **p** |
|---|---|---|---|---|---|---|---|---|---|
| | $\bar{x}$ | *s* | $\bar{x}$ | *s* | $\bar{x}$ | *s* | $\bar{x}$ | *s* | |
| Comprehensibility | 38.2 | 9.8 | 43.3 | 9.3 | 43.8 | 9.8 | 44.9 | 8.6 | 0.0168* |
| Manageability | 43.6 | 10.3 | 47.1 | 9.2 | 45.7 | 9.0 | 47.0 | 8.3 | 0.2289 |
| Meaningfulness | 39.8 | 10.5 | 41.0 | 8.6 | 40.2 | 8.0 | 40.3 | 7.8 | 0.8507 |
| Overall sense of coherence | 121.6 | 28.4 | 131.4 | 23.5 | 129.7 | 23.2 | 132.2 | 21.4 | 0.2069 |
| | | | | | | | | | |
| low level | 10 (37.0%) | | 29 (27.6%) | | 36 (25.7%) | | 17 (21.0%) | | 92 (26.1%) |
| average level | 14 (51.9%) | | 58 (55.2%) | | 91 (65.0%) | | 47 (58.0%) | | 210 (59.5%) |
| high level | 3 (11.1%) | | 18 (17.1%) | | 13 (9.3%) | | 17 (21.0%) | | 51 (14.4%) |
| Total | 27 | | 105 | | 140 | | 81 | | 353 |
| | (*P* = 0.3019) | | | | | | | | |
| | | | | | | | | | |
| **Place of residence** | **city (*N* = 271)** | | | | **village (*N* = 82)** | | | | **p** |
| | $\bar{x}$ | | *s* | | $\bar{x}$ | | *s* | | |
| Comprehensibility | 44.3 | | 9.5 | | 41.3 | | 8.9 | | 0.0121* |
| Manageability | 46.6 | | 9.3 | | 45.5 | | 8.0 | | 0.3117 |
| Meaningfulness | 40.7 | | 8.1 | | 40.4 | | 8.3 | | 0.7728 |
| Overall sense of coherence | 131.7 | | 23.7 | | 127.2 | | 20.7 | | 0.1290 |
| | | | | | | | | | |
| low level | 66 (24.4%) | | | | 22 (26.8%) | | | | 88 (24.9%) |
| average level | 162 (59.8%) | | | | 55 (67.1%) | | | | 217 (61.5%) |
| high level | 43 (15.8%) | | | | 5 (6.1%) | | | | 48 (13.6%) |
| Total | 271 | | | | 82 | | | | 353 |
| | (*P* = 0.0662) | | | | | | | | |

However, there were no statistically significant differences in the individual levels of coherence in the different age groups. People living in cities had a significantly higher level of comprehensibility; while for other measures of coherence, place of residence was of no significance. The distribution of coherence levels was differentiated quite clearly between urban and rural areas, and this dependence is on the border of statistical significance (the value of *p* slightly exceeds 0.05). Urban dwellers had an almost 2.5-fold higher sense of coherence than nurses living in the countryside (Table II).

Comprehensibility and meaningfulness values were dependent on education, but only close to the level of statistical significance (Table III).

**Tab. III. Effect of education on coherence level (SOC-29)**

| **Education** | **medical vocational school (*N* = 110)** | | **medical high school (*N* = 124)** | | **bachelor's degree (*N* = 83)** | | **master's degree (*N* = 36)** | | p |
|---|---|---|---|---|---|---|---|---|---|
| | $\bar{x}$ | *s* | $\bar{x}$ | *s* | $\bar{x}$ | *s* | $\bar{x}$ | *s* | |
| Comprehensibility | 44.2 | 9.0 | 43.1 | 9.7 | 41.7 | 8.5 | 46.4 | 11.4 | 0.0696 |
| Manageability | 45.4 | 8.8 | 46.6 | 8.8 | 45.7 | 8.5 | 49.1 | 11.0 | 0.1798 |
| Meaningfulness | 39.2 | 8.2 | 40.2 | 8.4 | 41.4 | 8.2 | 42.8 | 8.2 | 0.0969 |
| Overall sense of coherence | 128.9 | 22.9 | 129.9 | 22.8 | 128.9 | 21.7 | 138.2 | 28.6 | 0.1828 |
| | | | | | | | | | |
| low level | 32 (29.1%) | | 32 (25.8%) | | 22 (26.5%) | | 6 (16.7%) | | 92 (26.1%) |
| average level | 63 (57.3%) | | 77 (62.1%) | | 53 (63.9%) | | 20 (55.6%) | | 213 (60.3%) |
| high level | 15 (13.6%) | | 15 (12.1%) | | 8 (9.6%) | | 10 (27.8%) | | 48 (13.6%) |
| Total | 110 | | 124 | | 83 | | 36 | | 353 |
| | (*P* = 0.1947) | | | | | | | | |
| | | | | | | | | | |
| **Professional experience [years]** | **<10 (*N* = 28)** | | **11-20 (*N* = 85)** | | **20-30 (*N* = 192)** | | **>30 (*N* = 48)** | | p |
| | $\bar{x}$ | *s* | $\bar{x}$ | *s* | $\bar{x}$ | *s* | $\bar{x}$ | *s* | |
| Comprehensibility | 44.2 | 10.0 | 42.5 | 8.9 | 44.1 | 9.2 | 45.6 | 9.4 | 0.3883 |
| Manageability | 50.1 | 9.5 | 46.3 | 8.5 | 46.2 | 8.8 | 46.6 | 8.6 | 0.1727 |
| Meaningfulness | 44.5 | 8.5 | 40.1 | 8.2 | 40.2 | 7.7 | 41.5 | 8.3 | 0.0455* |
| Overall sense of coherence | 138.8 | 25.2 | 128.9 | 22.2 | 130.5 | 22.2 | 133.7 | 22.5 | 0.2018 |
| | | | | | | | | | |
| low level | 5 (17.9%) | | 24 (28.2%) | | 49 (25.5%) | | 13 (27.1%) | | 91 (25.8%) |
| average level | 16 (57.1%) | | 50 (58.8%) | | 121 (63.0%) | | 21 (43.7%) | | 208 (58.9%) |
| high level | 7 (25.0%) | | 11 (12.9%) | | 22 (11.5%) | | 14 (29.2%) | | 54 (15.3%) |
| Total | 28 | | 85 | | 192 | | 48 | | 353 |
| | (*P* = 0.3830) | | | | | | | | |

The highest level of comprehensibility was characteristic of the most educated people, and the lowest of those with a bachelor's degree. The better one was educated, the higher the point values of this measure were. Education did not clearly affect classification according to overall coherence level, but despite the lack of statistically significant differences, those with a

master's degree had the least cases of low and the most cases of high coherence. In the examined group of nurses, work experience affected the sense of meaningfulness. Those who worked the shortest had the best results in this aspect (Table III).

Religion did not affect coherence level (Table IV). Correlations between the components of the sense of coherence were quite strong.

**Tab. IV. Effect of religion on coherence level (SOC-29)**

| **Level of coherence (SOC-29)** | **Religion** | | | | ***p*** |
|---|---|---|---|---|---|
| | **Roman Catholic (*N* = 311)** | | **Eastern Orthodox (*N* = 42)** | | |
| | $\bar{x}$ | *s* | $\bar{x}$ | *s* | |
| Comprehensibility | 43.5 | 9.6 | 44.1 | 7.9 | 0.6772 |
| Manageability | 46.1 | 9.3 | 47.5 | 6.6 | 0.3644 |
| Meaningfulness | 40.2 | 8.5 | 41.6 | 6.7 | 0.3284 |
| Overall sense of coherence | 129.8 | 23.9 | 133.2 | 18.1 | 0.3867 |
| | | | | | |
| low level | 83 (26.7%) | | 9 (21.4%) | | 92 |
| average level | 183 (58.8%) | | 28 (66.7%) | | 211 |
| high level | 45 (14.5%) | | 5 (11.9%) | | 50 |
| Total | 311 | | 42 | | 353 |
| | (*P* = 0.3279) | | | | |

The weakest correlation occurred between the sense of meaningfulness and comprehensibility (R = 0.47). All these correlations were statistically significant (Table V).

**Tab. V. Correlations between components of sense of coherence**

| **SOC-29** | Comprehensibility | Manageability | Meaningfulness | Coherence |
|---|---|---|---|---|
| Comprehensibility | 1 | 0.62 (0.0000***) | 0.47 (0.0000***) | 0.81 (0.0000***) |
| Manageability | 0.62 (0.0000***) | 1 | 0.72 (0.0000***) | 0.91 (0.0000***) |
| Meaningfulness | 0.47 (0.0000***) | 0.72 (0.0000***) | 1 | 0.85 (0.0000***) |
| Overall sense of coherence | 0.81 (0.0000***) | 0.91 (0.0000***) | 0.85 (0.0000***) | 1 |

As can be seen in Table VI, people who had contact with the death of an immediate family member had a significantly higher sense of meaningfulness. Whereas, the levels of other coherence measures did not differ significantly between the compared groups. When it comes to classification distribution according to coherence level, the differences between the compared groups were similar to the level of statistical significance ($p = 0.0747$). A lower level of overall coherence occurred among people who had had no experience of the death of a loved one.

In the next part of the study, the GHQ-28 was used to assess symptoms of mental health disturbances in adults. Table VII presents the distribution of GHQ measures in the studied population. Taking into account the possible range of the component measures (up to 7 points) and the total measure (up to 28 points), the obtained results indicate a good mental health status of the surveyed nurses (Tab. VII).

**Tab. VI. Correlations between components of sense of coherence and the death of a relative**

| **Level of coherence (SOC-29)** | **Did someone from your family die in the last year?** | | | | ***p*** |
|---|---|---|---|---|---|
| | **yes (*N* = 153)** | | **no (*N* = 200)** | | |
| | $\bar{x}$ | *s* | $\bar{x}$ | *s* | |
| comprehensibility | 43.5 | 8.9 | 43.4 | 9.6 | 0.9371 |
| manageability | 47.7 | 8.7 | 46.0 | 8.7 | 0.1257 |
| meaningfulness | 42.2 | 7.8 | 40.1 | 7.8 | 0.0241* |
| Overall sense of coherence | 133.4 | 21.8 | 129.5 | 22.9 | 0.1574 |
| | | | | | |
| low level | 32 (34.8%) | | 60 (65.2%) | | 92 |
| average level | 98 (46.1%) | | 115 (53.9%) | | 213 |
| high level | 23 (47.9%) | | 25 (52.1%) | | 48 |
| Total | 153 | | 200 | | 353 |
| | **(*P* = 0.0747)** | | | | |

**Tab. VII. Distribution of GHQ measures**

| **GHQ 28** | *N* | $\bar{x}$ | Me | *s* | $c_{25}$ | $c_{75}$ | min. | max. |
|---|---|---|---|---|---|---|---|---|
| Somatic symptoms | 353 | 2.17 | 1 | 2.18 | 0 | 4 | 0 | 7 |
| Anxiety, insomnia | 353 | 1.88 | 1 | 2.29 | 0 | 3 | 0 | 7 |
| Social dysfunctions | 353 | 1.03 | 0 | 1.84 | 0 | 2 | 0 | 7 |
| Depression symptoms | 353 | 0.57 | 0 | 1.34 | 0 | 0 | 0 | 7 |
| GHQ (overall score) | 353 | 5.63 | 4 | 6.27 | 1 | 8 | 0 | 26 |
| | | | | | | | | |
| scale/symptoms | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| somatic | 32% | 19% | 12% | 9% | 8% | 10% | 6% | 4% |
| anxiety, insomnia | 48% | 9% | 10% | 9% | 7% | 6% | 5% | 6% |
| social dysfunctions | 66% | 9% | 9% | 5% | 4% | 2% | 2% | 4% |
| depression | 76% | 11% | 5% | 3% | 1% | 1% | 1% | 1% |
| | | | | | | | | |

| | 20-30 (*N* = 27) | | 31-40 (*N* = 105) | | 41-50 (*N* = 140) | | >50 (*N* = 81) | | p |
|---|---|---|---|---|---|---|---|---|---|
| | $\bar{x}$ | Me | $\bar{x}$ | Me | $\bar{x}$ | Me | $\bar{x}$ | Me | |
| somatic | 2.04 | 1 | 2.24 | 2 | 1.99 | 1 | 2.50 | 2 | 0.4044 |
| Anxiety, insomnia | 2.30 | 1 | 2.22 | 2 | 1.59 | 0 | 1.87 | 1 | 0.2662 |
| Social dysfunctions | 0.81 | 0 | 1.13 | 0 | 0.86 | 0 | 1.30 | 0 | 0.3907 |
| depression | 1.00 | 0 | 0.77 | 0 | 0.39 | 0 | 0.47 | 0 | 0.0585 |
| GHQ (overall score) | 6.15 | 2 | 6.36 | 4 | 4.83 | 3 | 6.07 | 4.5 | 0.4213 |

The respondents presented the worst results in terms of somatic symptom occurrence, and the lowest intensity of depression symptoms. The exact distribution of the values of the four component measures of the GHQ-28 indicated a clearly large asymmetry in the distributions of these measures (low or very low values prevailed). To a small extent, age differentiated the occurrence of negative mental health symptoms. Only symptoms of depression were dependent on age, but the differences between the age groups were only close to the level of statistical significance, which may suggest that the nurses from the youngest age group were the most susceptible to depression (Tab. VII).

People from cities had a significant higher level of negative symptoms associated with anxiety and insomnia. Whereas, education did not differentiate mental health measures obtained on the basis of the GHQ-28 (Table VIII).

**Tab. VIII. Distribution of GHQ measures depending on place of residence, education, work experience, and religion**

| GHQ 28 | Place of residence (N=353) | | | | *p* |
|---|---|---|---|---|---|
| | city (*N* = 271) | | village (*N* = 82) | | |
| | $\bar{x}$ | Me | $\bar{x}$ | Me | |
| Somatic symptoms | 2.23 | 1.5 | 1.88 | 1 | 0.1649 |
| Anxiety, insomnia | 1.99 | 1 | 1.46 | 0 | 0.0282* |
| Social dysfunctions | 1.11 | 0 | 0.77 | 0 | 0.2358 |
| Depression symptoms | 0.54 | 0 | 0.66 | 0 | 0.3674 |
| GHQ (overall score) | 5.85 | 4 | 4.77 | 2 | 0.1176 |

| GHQ 28 | Education (N=353) | | | | | | | | *p* |
|---|---|---|---|---|---|---|---|---|---|
| | medical vocational school (*N* = 110) | | medical high school (*N* = 124) | | bachelor's degree (*N* = 83) | | master's degree (*N* = 36) | | |
| | $\bar{x}$ | Me | $\bar{x}$ | Me | $\bar{x}$ | Me | $\bar{x}$ | Me | |
| Somatic symptoms | 2.35 | 2 | 2.16 | 1 | 2.00 | 1 | 2.06 | 1 | 0.8703 |
| Anxiety, insomnia | 1.83 | 1 | 1.81 | 0 | 2.07 | 1 | 1.83 | 0 | 0.7351 |
| Social dysfunctions | 0.94 | 0 | 0.94 | 0 | 1.16 | 0 | 1.29 | 0 | 0.8356 |
| Depression symptoms | 0.48 | 0 | 0.55 | 0 | 0.66 | 0 | 0.68 | 0 | 0.5943 |
| GHQ (overall score) | 5.60 | 4 | 5.47 | 3 | 5.89 | 4 | 5.65 | 1.5 | 0.8816 |

| GHQ 28 | Duration of professional experience/years (N=353) | | | | | | | | *p* |
|---|---|---|---|---|---|---|---|---|---|
| | <10 (*N* = 28) | | 11-20 (*N* = 85) | | 20-30 (*N* = 192) | | >30 (*N* = 48) | | |
| | $\bar{x}$ | Me | $\bar{x}$ | Me | $\bar{x}$ | Me | $\bar{x}$ | Me | |
| Somatic symptoms | 1.64 | 1 | 2.36 | 2 | 2.10 | 1 | 2.81 | 2 | 0.1122 |
| Anxiety, insomnia | 1.29 | 0 | 2.41 | 2 | 1.67 | 0 | 2.12 | 1 | 0.0369* |
| Social dysfunctions | 0.29 | 0 | 1.35 | 0 | 0.94 | 0 | 1.46 | 0 | 0.0567 |
| Depression symptoms | 0.32 | 0 | 0.91 | 0 | 0.42 | 0 | 0.38 | 0 | 0.1831 |
| GHQ (overall score) | 3.54 | 2 | 7.04 | 5 | 5.10 | 3 | 6.77 | 5 | 0.0270* |

| GHQ 28 | Religion (N=353) | | | | *p* |
|---|---|---|---|---|---|
| | Roman Catholic (*N* = 311) | | Other (*N* = 42) | | |
| | $\bar{x}$ | Me | $\bar{x}$ | Me | |
| Somatic symptoms | 2.24 | 1.5 | 1.68 | 1 | 0.1424 |
| Anxiety, insomnia | 1.93 | 1 | 1.55 | 1 | 0.5341 |
| Social dysfunctions | 1.08 | 0 | 0.70 | 0 | 0.7531 |
| Depression symptoms | 0.60 | 0 | 0.32 | 0 | 0.4512 |
| GHQ (overall score) | 5.82 | 4 | 4.25 | 3.5 | 0.4819 |

Correlations between the intensity of the various types of symptoms were statistically significant and were usually of at least average strength. Symptoms of depression were the least correlated with the other measures (Tab. IX).

**Tab. IX. Correlations between GHQ-28 components**

| GHQ-28 | Somatic symptoms | Anxiety, insomnia | Social dysfunctions | Depression symptoms | GHQ |
|---|---|---|---|---|---|
| Somatic symptoms | 1 | 0.61 (0.0000***) | 0.53 (0.0000***) | 0.43 (0.0000***) | 0.86 (0.0000***) |
| Anxiety, insomnia | 0.61 (0.0000***) | 1 | 0.59 (0.0000***) | 0.54 (0.0000***) | 0.86 (0.0000***) |
| Social dysfunctions | 0.53 (0.0000***) | 0.59 (0.0000***) | 1 | 0.53 (0.0000***) | 0.73 (0.0000***) |
| Depression symptoms | 0.43 (0.0000***) | 0.54 (0.0000***) | 0.53 (0.0000***) | 1 | 0.61 (0.0000***) |
| GHQ | 0.86 (0.0000***) | 0.86 (0.0000***) | 0.73 (0.0000***) | 0.61 (0.0000***) | 1 |

Experiencing death did not affect the psychological well-being measured using the GHQ-28. Results are shown in Tab. X.

**Tab. X. Distribution of GHQ measures depending on place of residence, education, work experience, and religion**

| GHQ 28 | Did someone from your family die in the last year? | | | | *p* |
|---|---|---|---|---|---|
| | yes (*N* = 153) | | no (*N* = 200) | | |
| | $\bar{x}$ | Me | $\bar{x}$ | Me | |
| somatic symptoms | 2.17 | 1 | 2.25 | 2 | 0.7255 |
| anxiety, insomnia | 1.85 | 1 | 1.95 | 1 | 0.8874 |
| social dysfunctions | 1.08 | 0 | 1.12 | 0 | 0.7566 |
| depression symptoms | 0.54 | 0 | 0.67 | 0 | 0.5119 |
| GHQ (overall score) | 5.58 | 4 | 5.99 | 4 | 0.9400 |

Whereas, the level of overall coherence was clearly associated with the occurrence of symptoms of feeling unwell. Correlations were negative, and the strongest relationships

concerned the total GHQ-28 score and overall sense of coherence. Results are shown in Tab. XI.

**Tab. XI. Relationships between coherence level and the occurrence of symptoms of feeling unwell**

| **GHQ-28** | **SOC-29** | | | |
|---|---|---|---|---|
| | Comprehensibility | Manageability | Meaningfulness | Coherence |
| Somatic symptoms | -0.27 (0.0000***) | -0.30 (0.0000***) | -0.31 (0.0000***) | -0.33 (0.0000***) |
| Anxiety, insomnia | -0.33 (0.0000***) | -0.33 (0.0000***) | -0.34 (0.0000***) | -0.39 (0.0000***) |
| Social dysfunctions | -0.23 (0.0000***) | -0.24 (0.0000***) | -0.27 (0.0000***) | -0.28 (0.0000***) |
| Depression symptoms | -0.30 (0.0000***) | -0.31 (0.0000***) | -0.35 (0.0000***) | -0.37 (0.0000***) |
| GHQ | -0.34 (0.0000***) | -0.36 (0.0000***) | -0.38 (0.0000***) | -0.41 (0.0000***) |

| **SOC-29** | **GHQ-28** | | | | |
|---|---|---|---|---|---|
| | Somatic symptoms | Anxiety, insomnia | Social dysfunctions | Depression symptoms | GHQ |
| Comprehensibility | -0.27 (0.0000***) | -0.33 (0.0000***) | -0.23 (0.0000***) | -0.30 (0.0000***) | -0.34 (0.0000***) |
| Manageability | -0.30 (0.0000***) | -0.33 (0.0000***) | -0.24 (0.0000***) | -0.31 (0.0000***) | -0.36 (0.0000***) |
| Meaningfulness | -0.31 (0.0000***) | -0.34 (0.0000***) | -0.27 (0.0000***) | -0.35 (0.0000***) | -0.38 (0.0000***) |
| Coherence | -0.33 (0.0000***) | -0.39 (0.0000***) | -0.28 (0.0000***) | -0.37 (0.0000***) | -0.41 (0.0000***) |

## Discussion

According to Antonovsky [1], people with a high overall sense of coherence more often assess life events as not stressful, making the assumption that they can easily cope with them. Even if they assess a situation as stressful, they judge it as harmless, because they are convinced that everything will work out in the end as it had before [1].

It is believed that people with a high sense of coherence show a greater ability to organize and to attach emotional sense to difficult situations, which enables maintaining internal tranquility and balance [1,4].

Nurses from the study by Kocięcka et al. [5] presented a diversified level of overall coherence, and its overall strength evidently affected the nurses' mental health. Urbańska and Kurowska [6] examined 77 nurses from four different departments and found that they did not differ from each other in terms of sense of coherence, nor its components. The overall SOC in

nurses was 130 (92-167 points), with mean comprehensibility at 51.24, manageability 42.54, and meaningfulness 35.55 points [6].

In the current study, the mean overall sense of coherence was similar to that obtained by the nurses in the study by Urbańska and Kurowska [6], and was 130.2±23.3, with a lower than in their study mean comprehensibility (43.5±9.5) and a higher mean manageability (46.3±9.0) and meaningfulness (40.4±8.3).

The respondents' education was not a differentiating factor in the SOC in the nurses studied by Urbańska and Kurowska [6].

Our study showed that those with the highest education level had higher comprehensibility than others. Urban residents had significantly higher comprehensibility levels, while meaningfulness was the highest in those who worked the shortest.

Oxelmark et al. [7] found that the SOC may decrease when receiving bad news and increase while planning therapeutic interventions. Whereas, Rębak and Głuszek [8] emphasized that the sense of coherence is also considered to be an important variable related to professional functioning and may modify the relationship between the experienced stress levels and the negative effects of stress.

The death of a loved one is undoubtedly a painful experience, entailing unbearable anxiety, despair, feelings of helplessness, and a risk of losing the meaning and purpose of life [9]. The resources described in the literature that ease coping with a crisis include: resilience, dispositional optimism, high levels of hope, high self-esteem, effectiveness, coherence, belief in having control, emotional stability, low levels of negative affect and high levels of positive affect, and social support. A high sense of coherence is also conducive to effectively dealing with a crisis A sense of manageability is particularly important, indicating a higher level of dependence, compared with the other components, on the complete process of coping, and greatly influencing a decrease in the assessment of event stressfulness, increasing the chances of seeing stressful events as challenges [9].

In the current study, people who had experienced an immediate family member's death had a significantly higher sense of meaningfulness. A lower level of overall coherence occurred among people who had had no experience of the death of a loved one.

The modern world has various types of threats to human health. Many of them pertain to the work environment and ways of functioning in it. Continuous changes force new adaptation processes in the professional environment, causing people to struggle with many difficult situations. The nursing profession is one of the most dangerous professions because of

the specific symptom of stress caused by other people. A nurse works in a team of other nurses, cooperates with a medical team and representatives of other medical professions, as well as with the patient and his/her family, often in situations of high emotional tension. The study by Andruszkiewicz et al. [10,11,12] showed that the mean severity of mental health irregularities in a group of nurses was average. The study almost did not reveal symptoms of depression, but most often had somatic complaints as well as anxiety and sleep problems. Age and duration of professional experience correlated statistically significantly with the occurrence of somatic symptoms, anxiety, insomnia, and social functioning disorders. The older people were and the longer they had worked, the more they reported somatic symptoms and anxiety, had sleep problems, and social functioning disorders [10]. Another study by Andruszkiewicz et al. [11] indicated that in a group of pulmonary nurses the mean intensity of health problems was average. The study did not reveal disorders of the depressive type, and most often revealed health problems such as: somatic symptoms, anxiety, insomnia, and disorders in social functioning [11].

In the current study, age differentiated the occurrence of negative mental health symptoms to a small extent. Only symptoms of depression were dependent on age (differences were only close to the level of statistical significance), which may suggest that the nurses most susceptible to depression may belong to the youngest age group.

Andruszkiewicz et al. [10,11,12] emphasized that stressful work leads to fatigue in nurses. The fatigue manifests as impairment of general psychomotor activity, deterioration of well-being, increased psychomotor tension, weakening of emotional reactions, and chronic stress reactions to intercorporeal disorders, the formation of psychosomatic disorders and neurotic syndromes. In the study by Nyklewicz and Krajewska-Kułak [12], which used the GHQ-28, 61% of the respondents were healthy and 39% had emotional health disorders.

In our study, urban residents had a significantly higher level of negative symptoms associated with anxiety and insomnia. Education and religion did not differentiate mental health measures. We found the lowest mental disorder levels in people working the shortest.

Each person and each of his/her spheres (biological, psychological, social and spiritual) comes with certain resources (predispositions), which may become active in specific life situations, triggering the process towards health or disease [13]. A person naturally exposed to the constant effects of stressors reacts to them and tunes in to them so as to maintain a dynamic equilibrium of life processes at optimal levels [1]. A high sense of coherence functions as an effective buffer protecting the individual from negative effects on health, despite the effect of

many stressors [14].

In our study, the overall coherence level was clearly associated with the occurrence of symptoms of feeling unwell.

The sense of coherence is considered to be an important variable related to professional functioning. Caring for and treating patients are activities that have a specific psychological stress arising from the constant confrontation with patients' problems and suffering. It seems that the assessment of the SOC values allows one to anticipate anti-health behaviors and the tendency to burn out professionally, and to protect against the need for early retirement [15, 16].

## Conclusions

1. Most of the studied nurses had an average level of coherence and good mental health.
2. The overall sense of coherence did not depend on the nurses' age, place of residence, education, or religion.
3. Experiencing the death of a close family member only caused a significantly higher sense of meaningfulness.
4. Urban residents had significantly higher levels of negative symptoms associated with anxiety and insomnia, while those that had worked the shortest had the lowest mental disorder levels.
5. The overall coherence level was associated with the occurrence of symptoms of feeling unwell.

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# Brain death is the death of the whole body in the context of social perception and organ donation

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## Introduction

The CBOS communication "Attitudes towards organ transplantation" [1] conducted on a representative random sample of adult Poles (N=3793) shows that the majority (74%) of them agreed to donate their organs after death, while about one-seventh (15%) were against it. Compared to the last two measurements (in 2009 and 2011), the percentage of people approving organ donation after death decreased. Three-quarters of Poles (75%) have not talked to their loved ones about donating their organs after death. About one in four respondents (24%) shared their decision with their loved ones. They were often the best educated, young, residents of large cities, well-off, rarely the oldest, and respondents with primary education. Nearly half of the respondents (49%) favored the traditional definition, understanding death as the cessation of the heart. In turn, over two-fifths (44%) believed that death occurs when the brain is irreversibly damaged. There is very little knowledge about the regulations regarding the collection of organs from deceased persons in Poland. Only 14% of respondents correctly indicated this was a presumed consent rule [1].

## Brain death

Brain death is the irreversible end of all brain activity (including involuntary activity necessary to sustain life) due to total necrosis of the cerebral neurons following loss of brain oxygenation. It should not be confused with a persistent vegetative state. Patients classified as brain dead can have their organs surgically removed for organ donation. Even after brain death, the heart's working might continue slowly, but there will be no respiratory effort [2,3]. Although some social disagreements or different diagnosis criteria remain in clinical practice worldwide [2], some standard tests, such as the apnea test and brainstem function examination, are widely used. In Poland, the definition of brain death was introduced on July 1, 1984, by the Communication Ministry of Health and Social Welfare [4]. The current guidelines are set out in the Notice of the Minister of Health of July 17, 2007, "On the criteria and establish permanent, irreversible cessation of brain function" [5]. Polish guidelines are similar to those

of other countries in Europe and America. According to different guidelines, brain death must be determined following accepted medical standards. The patient must undergo two brain death determinations, at least three hours apart, and meet all criteria listed below. Different licensed physicians must perform the two examinations: the first exam by any (including house staff), the second exam only by an attending physician not part of the primary team (i.e., a neurosurgeon, neurologist, or internist) [6-9]

**Apnea Test ]7]**

- Ventilate the patient with FiO2 of 1.0 at a rate and tidal volume to achieve eucapnia on arterial blood gas determination (pCO2 = 35 - 45 torr).
- Keep the patient on FiO2 of 1.0, and set the ventilator rate to zero. CPAP may be used for this. Inactivate backup apnea rate (i.e., do not allow the ventilator to override apnea).
- Observe the patient's chest closely for 10 minutes for signs of spontaneous breathing.
- If no spontaneous breaths are observed, ABG is obtained at the end of the 10 minutes. If a patient breathes, he/she has "passed" the apnea test and *cannot* be considered brain dead.
- If the patient does not breathe, and the 10-minute ABG pCO2 exceeds 55 torr, the patient has "failed" the apnea test. If the 10-minute ABG pCO2 does not reach 55 torr, repeat the test but wait longer than ten minutes (try 15 minutes) before obtaining the ABG.
- In patients with underlying COPD and baseline CO2 retention, adjust the baseline FiO2 to bring initial PaO2 into the 60-80 torr range. Terminate the apnea test prior to 10 minutes if: the patient has spontaneous respiratory efforts; the patient becomes profoundly hypoxic (O2 saturation < 80% by pulse-oximetry), or the patient becomes hemodynamically unstable.

**Brain Stem Reflexes [6,7,9]**

- Pupils are fixed, dilated, and unresponsive to direct light in the absence of drug effects or ocular trauma.
- Corneal reflexes are absent bilaterally. The patient should not blink when the corneas are lightly brushed.
- Cough and gag reflexes are absent bilaterally. The patient should not react when the pharynx is stimulated or when the endotracheal tube is suctioned.
- The doll's eye response is absent. When the head is turned from side to side, the eyes remain fixed in the orbits.

- Cold water caloric response absent bilaterally. Ice water is gently instilled into each external ear canal using a 30 ml syringe. No nystagmus (fast component towards the irrigated ear) is noted. Observe each side for one minute and allow five minutes between sides.

**Alameda County Medical Center Brain Death Criteria [7]**

- No spontaneous movements and no response to deep, painful bilateral stimuli
- Core temperature > 35 °C
- Sedatives, paralytic agents, exogenously ingested substances (cocaine, heroin)
- withheld for a period sufficient to exclude them as a cause of coma.
- A phenobarbital level < 15 was documented by laboratory assay.
- Apnea as determined by the apnea test (see below).
- Absence of all brain stem reflexes.

**Brain Stem Reflexes [6,7,9]**

- Pupils fixed, dilated and unresponsive to direct light in the absence of drug effects or ocular trauma.
- Corneal reflexes are absent bilaterally. The patient should not blink when the corneas are lightly brushed.
- Cough and gag reflexes are absent bilaterally. The patient should not react when the pharynx is stimulated or when the endotracheal tube is suctioned.
- The doll's eye response is absent. When the head is turned from side to side, the eyes remain fixed in the orbits.
- Cold water caloric response absent bilaterally. Ice water is gently instilled into each external ear canal using a 30 ml syringe. No nystagmus (fast component towards the irrigated ear) is noted. Observe each side for one minute and allow five minutes between sides.

## Context and organ donation

Obtaining organs often follows the same procedure referred to as the "six-step strategy":

- Identification of potential donors amongst deceased individuals,
- Satisfying clinical procedures and legal requirements necessary for obtaining organs or tissues,
- Satisfying of social requirements (contacting donor's family) and legal requirements (acting according to the law),

- Offering care for potential donors,
- Appropriate harvesting of tissues and organs for transplantation,
- Selection of appropriate recipient [10].

Organ transplantation is a specific form of treatment. It requires an organ transplant, most commonly collected from a deceased individual or rarer, from a live individual related to the recipient [10]. The donor can be a live human being or a human cadaver from whom organs, cells, or tissues were collected. The following types of donors are recognized [10,11]: potential – individuals in whom the procedure of confirming brain death was initiated and completed and no contraindications against organ collection were found; probable – individuals with severe brain injuries (primary or secondary) in whom no absolute contraindications were documented. Giving consent to organ collection – individuals who did not register their refusal to donate organs in the Central Registry of Refusals during their life and both their family members and prosecutor consent for organ harvesting. According to the Polish law, the refusal to donate organs can be expressed in the following forms [10,11]: written, signed declaration verbal declaration in the presence of at least two witnesses, who confirmed it in writing; registered – Individuals possessing the donor card and electronic record in the "Poltransplant" registry; real – individuals from whom at least one organ was obtained and utilized – donors whose organs were transplanted. A deceased organ donor is an individual whose brain death was confirmed; the organs of such a person can be obtained "by beating heart" or after irreversible circulatory arrest. Obtaining organs from potential deceased donors always follows the same procedure [10-16]:

- First step – the identification and registration of potential donors**.** In Poland, donors are most commonly selected from the patients of traumatology departments, ICUs, emergency, neurological, and neurosurgical departments. Information on the potential donor is sent from these departments to the Polish Transplant Coordinating Center "Poltransplant." The information on the potential donor sent to the coordinator should include the following: name of the hospital, primary personal data of the patient, his/her blood group, essential clinical information along with the results of basic tests, cause of death, history of previous diseases, information if the procedure of brain death confirmation was implemented and if the approval of prosecutor or family court is required prior to obtaining organs. Subsequently, the tests required for final qualification of the potential donor should be performed (infections with *Mycobacterium tuberculosis*, *Treponema palidum*, *Toxoplasma*, *Human Immunodeficiency Virus*,

*Hepatitis B Virus, Hepatitis C Virus,* and *Cytomegalovirus* should be included; additionally, *Epstein Barr virus* and *Human T-Lymphotropic Virus* infections need to be excluded in some centers). According to Polish law, it is forbidden to obtain organs from individuals with unknown identities, newborns up to 7 days of life, patients in whom brain death was not diagnosed prior to circulatory arrest, and individuals who registered their refusal with the Central Registry of Refusals.

- The second step – is confirming brain death in potential donors. In Poland, retrieval of transplantation organs is possible after confirming permanent and irreversible cessation of brain function. Brain death is tantamount to confirming one's death. In Poland, brain death is confirmed based on cessation of function of the brain stem, confirmed clinically as coma, permanent apnea, and lack of reflexes in areas supplied by the cranial nerves (pupillary response, corneal reflex, eye movements, motor response to painful stimulation of face and other areas supplied by the cranial nerves, vomiting and cough reflexes, and oculocephalic reflex). The examination is performed twice in 6-hour intervals in the case of primary injury or after 24 hours in the case of secondary injury. Instrumental examinations, such as Electroencephalography, Brainstem Auditory Evoked Potentials, Somatosensory Evoked Potentials, cerebral angiography, brain perfusion scintigraphy, and transcranial Doppler ultrasonography are used to confirm brain death. According to the law, brain death has to be confirmed by a committee comprising three specialist physicians, including one with a specialization in anesthesiology and intensive care and another specialized in neurology or neurosurgery.
- Third step – care for organ donors**.** Supplying care to the organ donor is to avoid unfavorable effects of various factors (hypovolemia, respiratory disorders, infections, hypotension, hypertension, thermoregulatory disorders, and hormonal disorders) on the biological value of organs. The parameters monitored in the donor include electric activity of the heart, arterial blood pressure, saturation, diuresis, and body temperature.
- Fourth step – evaluation of organs for transplantation**.** During this stage, absolute and relative contraindications to organ retrieval should be verified based on laboratory tests, imaging, medical history, clinical status, and physical examination of the donor.
- Fifth step – the retrieving team's coordination of the retrieval procedure and transport. The coordinator, i.e., the Polish Transplant Coordinating Center, decides which organs will be retrieved and when. Additionally, the coordinator organizes the transport of transplant teams and informs hospital coordinators from hospitals where the obtained

organs will be transplanted. The hospital coordinators complete the donor's documentation and prepare the surgical theatre and relevant personnel.

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# Mental health and styles of coping with stress, emotions and anxiety in nurses

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## Introduction

Professional work is one of the most important forms of human activity and can positively affect us as well as be the source of psychological discomfort and frustration [1]. It is believed that the health of each worker is mainly dependent on his/her ability to cope with stressful situations, and the quality of coping with stressful situations is primarily dependent on the individual's self-perception and his/her own capabilities in the context of a specific stressful situation [2,3].

Recently, interest in the occurrence of stress in nurses' work environment has clearly increased, because this professional group is exposed to the effects of various stressogenic factors connected with saving patients' lives [1].

Hochschild identified 44 professions requiring emotional labor, classifying them into six groups [4]:

1. independent professionals (i.e. lawyers and doctors);
2. managers and administrative workers;
3. salespeople;
4. public administration;
5. people working in private households (domestic help);
6. service professionals (waiters, hairdresser, barber).

Numerous somatic pathologies can develop as a result of chronic stress, including myocardial ischemia, hypertension, stroke, digestive disorders, musculoskeletal disorders, depressive type disorders, neurotic syndromes, sleep disorders, and decreased immunity leading to viral, bacterial, and degenerative diseases as well as cancer [5].

Thus, in situations when a person experiences negative emotions, it is important to determine the emotional control indicator measuring the subjective conviction of an individual about their ability to control their own reactions [6].

The main aim of the study was to assess correlations between styles of coping with

stress, emotions and anxiety in professionally active nurses.

## Materials and methods

The study was approved by the Bioethics Committee of the Medical University of Bialystok (R-I-002/425/2017).

A total of 350 professionally active nurses were included. The study was based on a diagnostic survey using:

- An original questionnaire composed of questions regarding age, place of residence, workplace, professional experience, position held, religion, and experiencing the death of a close friend or relative within the last year.
- The Coping Inventory for Stressful Situations (CISS) by Endler and Parker (the Polish adaptation by Szczepaniak, Wrześniewski, and Strelau) for assessing styles of coping with stress allowing to evaluate task-oriented style (TOS), emotion-oriented style (EOS), and avoidance-oriented style (AOS), including distraction (D) and social diversion (SD) [7].
- The INTE Questionnaire by Schutte, Malouff, Hall, Haggerty, Cooper, Gloden, Dornheim (the Polish adaptation by Ciechanowicz, Jaworowska, Matczak) for assessing emotional intelligence understood as the ability to identify, understand, and manage one's own emotions and the emotions of others, as well as to effectively use emotions to manage one's own and other people's actions [8].
- The Sense Of Coherence Questionnaire (SOC-29) by Antonovsky (the Polish adaptation by the Department of Clinical Psychology at the Institute of Psychiatry and Neurology in Warsaw, the Department of Psychoprophylaxis at the Adam Mickiewicz University in Poznan, and the Department of Health and Work Psychology at the Nofer Institute of Occupational Medicine in Lodz, 1993) enables estimating the overall sense of coherence (SOC), and in three dimensions: comprehensibility, manageability, and meaningfulness [9].
- The General Health Questionnaire 28 (GHQ-28) by Goldberg (the Polish adaptation by Makowska, Merecz), enabling to identify people whose mental state has deteriorated temporarily or in the long-term a result of experienced difficulties, problems, or as a result of mental illness as well as people with a significant risk of mental health disorders. In addition to the general score, the GHQ-28 version has four subscales: somatic symptoms (GHQ-A); anxiety, insomnia (GHQ-B); social dysfunction (GHQ-

C); and symptoms of depression (GHQ-D) [10,11].

- The State Trait Anxiety Inventory (STAI*)* is a tool intended for studying anxiety understood as a temporary and situationally conditioned state as well as anxiety understood as a relatively stable personality trait. The authors of the STAI are C.D. Spielberger, R. L. Gorsuch, and R. E. Lushene. C. D. Spielberger, J. Strelau, M. Tysarczyk, and K. Wrześniewski adapted the inventory into the Polish [12].
- The Courtauld Emotional Control Scale (CECS**)** is a self-report tool and consists of three subscales, each of which contains seven statements pertaining to methods of expressing anger, depression and anxiety. Watson M. and Greer S. are the authors, and Juczyński Z. adapted the scale into the Polish. It is used to measure subjective control of anger, anxiety and depression in difficult situations [12].

The obtained results were analyzed using the chi-square test; Spearman's rank correlation analysis, the t-test for independent samples, the analysis of variance test, the Mann-Whitney test, or the Kruskal-Wallis test, as appropriate.

## Results

The questionnaire was conducted among a group of 353 professionally active nurses. In the study population, respondents aged 31-40 years (29.7%) or 41-50 years (39.7%) predominated. Those aged 20-30 constituted 7.7%, and those over 50 years 22.9%. Most respondents in the group resided in urban areas (76.8%). Only 23.2% of respondents were rural residents. A total of 31.2% of the respondents were graduates of medical vocational school, and 35.1% of medical high school. A bachelor's degree was declared by 23.5% of the respondents, and higher education was reported by 10.2%. Most respondents were employed in medical treatment units (47.3%), and then surgical units (36%), and the least in clinics (16.7%). Most of the surveyed population (54.4%) was comprised of people with extensive professional experience, working 20-30 years. The next largest group included people with work experience of 11-20 years (24.1%), then those working over 30 years (13.6%), and the smallest group worked 10 years or less (7.9%). Unit nurse was the predominant position (63.5%). Then, 17.8% of the respondents worked as ward or coordinating nurses, while 18.7% as serology, infection control, community, school, dispatcher, emergency room, or surgical nurses. In the studied population, adherents of the Catholic religion (88.1%) predominated, followed by Eastern Orthodox (11.9%).

In the first stage, we evaluated correlations between anxiety (as assessed on the STAI)

with all the other psychometric measures. We found that people with the task-oriented style of coping felt less anxiety, similarly to people who use social diversion in difficult life situations. However, these correlation were quite weak (*R* did not exceed the absolute value of 0.30). Stronger correlations occurred between the emotion-oriented style of coping with difficult situations and anxiety level, particularly "stable" anxiety (trait anxiety). The more emotional the approach to solving problems, the higher the level of experienced anxiety (Tab. I). There was a strong relationship with anxiety and coherence levels, with correlations slightly stronger for the X-2 component of the STAI. The greater the sense of coherence, the lower the level of anxiety. This suggests that on the basis of the SOC-29, one can predict the "anxiety" attitude of nurses quite well (Tab. I).

**Tab. I. Correlations between STAI and other scales**

| | **STAI** | |
|---|---|---|
| | **State anxiety (X-1)** | **Trait anxiety (X-2)** |
| **CISS** | | |
| Task-oriented style (TOS) | -0.26 (0.0000***) | -0.26 (0.0000***) |
| Emotion-oriented style (EOS) | 0.46 (0.0000***) | 0.67 (0.0000***) |
| Avoidance-oriented style (AOS) | -0.04 (0.4771) | 0.00 (0.9382) |
| Distraction (D) | 0.07 (0.2219) | 0.15 (0.0058**) |
| Social diversion (SD) | -0.23 (0.0000***) | -0.25 (0.0000***) |
| **SOC-29** | | |
| | State anxiety (X-1) | Trait anxiety (X-2) |
| Comprehensibility | -0.41 (0.0000***) | -0.52 (0.0000***) |
| Manageability | -0.51 (0.0000***) | -0.61 (0.0000***) |
| Meaningfulness | -0.48 (0.0000***) | -0.61 (0.0000***) |
| Overall coherence | -0.54 (0.0000***) | -0.67 (0.0000***) |
| **GHQ-28** | | |
| Somatic symptoms | 0.30 (0.0000***) | 0.37 (0.0000***) |
| Anxiety insomnia | 0.39 (0.0000***) | 0.46 (0.0000***) |
| Social dysfunctions | 0.28 (0.0000***) | 0.37 (0.0000***) |
| Depression symptoms | 0.34 (0.0000***) | 0.44 (0.0000***) |
| Total GHQ | 0.40 (0.0000***) | 0.48 (0.0000***) |

Next, we assessed correlations between symptoms of feeling unwell and anxiety. They proved to be statistically significant, but the strength was poor or mediocre (correlation coefficient did not exceed 0.50). The worse the nurses felt, the stronger their anxiety was. Components of the GHQ-28 with X-2 had slightly stronger relations. The assessment accuracy of the anxiety level based on the total GHQ-28 measure was not high. Particularly for people with a low level of symptoms (GHQ close to 0 points), the assessment of anxiety should be considered imprecise.

In the next stage, we evaluated correlations between the results obtained using the CISS and the STAI. We found that people with greater feelings of anxiety more often solved problems using the emotional approach, and less frequently using the task-oriented style of coping.

There were no significant strong correlations between the suppression of negative emotions and the problem-solving method. Those who suppressed depression and anxiety more had slightly higher values for the EOS component (they more often decided to use the emotional approach to solving problems), but these correlations were very weak (Tab. III). Strong correlations occurred between the coherence level and the emotional approach to solving problems. These correlations were negative, which means that people with higher coherence were less emotional. Whereas, with increasing coherence the frequency of applying the task-oriented style rose, but these correlations were weaker (*R* - approx. 0.30). Results are shown in Tab. III. The occurrence of symptoms of feeling unwell influenced more frequent use of the emotion-oriented style. The strongest correlation concerned the total GHQ-28 and SSE measures, but this was not a very strong relationship (Tab. III).

**Tab. II. Correlations between STAI and CISS**

| **STAI** | **CISS** | | | | |
|---|---|---|---|---|---|
| | Task-oriented style (TOS) | Emotion-oriented style (EOS) | Avoidance-oriented style (AOS) | Distraction (D) | Social diversion (SD) |
| State anxiety (X-1) | -0.26 (0.0000***) | 0.46 (0.0000***) | -0.04 (0.4771) | 0.07 (0.2219) | -0.23 (0.0000***) |
| Trait anxiety (X-2) | -0.26 (0.0000***) | 0.67 (0.0000***) | 0.00 (0.9382) | 0.15 (0.0058**) | -0.25 (0.0000***) |

**Tab. III. Correlations between CISS and other scales**

| | **CISS** | | | | |
|---|---|---|---|---|---|
| | Task-oriented style (TOS) | Emotion-oriented style (EOS) | Avoidance-oriented style (AOS) | Distraction (D) | Social diversion (SD) |
| **CECS** | | | | | |
| anger | -0.04 (0.5189) | 0.02 (0.6837) | -0.10 (0.0614) | 0.00 (0.9798) | -0.20 (0.0003***) |
| depression | -0.09 (0.1124) | 0.22 (0.0000***) | -0.14 (0.0104*) | 0.01 (0.9140) | -0.22 (0.0001***) |
| fear | -0.04 (0.4207) | 0.18 (0.0010***) | -0.21 (0.0001***) | -0.09 (0.1139) | -0.27 (0.0000***) |
| all emotions | -0.07 (0.1893) | 0.15 (0.0068**) | -0.18 (0.0008***) | -0.03 (0.5345) | -0.27 (0.0000***) |
| **SOC-29** | | | | | |
| Comprehensibility | 0.25 (0.0000***) | -0.54 (0.0000***) | -0.14 (0.0081**) | -0.22 (0.0000***) | 0.13 (0.0122*) |
| Manageability | 0.31 | -0.48 | -0.05 | -0.19 | 0.23 |

| | | | | | |
|---|---|---|---|---|---|
| | (0.0000***) | (0.0000***) | (0.3445) | (0.0005***) | (0.0000***) |
| Meaningfulness | 0.29 (0.0000***) | -0.43 (0.0000***) | -0.02 (0.7777) | -0.16 (0.0028**) | 0.26 (0.0000***) |
| Coherence | 0.33 (0.0000***) | -0.56 (0.0000***) | -0.08 (0.1561) | -0.21 (0.0001***) | 0.24 (0.0000***) |
| **GHQ-28** | | | | | |
| Somatic symptoms | -0.09 (0.1082) | 0.32 (0.0000***) | 0.05 (0.3305) | 0.12 (0.0246*) | -0.08 (0.1169) |
| Anxiety insomnia | -0.05 (0.3698) | 0.40 (0.0000***) | 0.03 (0.5680) | 0.09 (0.0875) | -0.11 (0.0454*) |
| Social dysfunctions | -0.04 (0.4462) | 0.29 (0.0000***) | -0.02 (0.6817) | 0.00 (0.9433) | -0.07 (0.1646) |
| Depression symptoms | -0.08 (0.1301) | 0.35 (0.0000***) | -0.03 (0.5606) | 0.04 (0.4279) | -0.17 (0.0011**) |
| GHQ | -0.06 (0.2627) | 0.42 (0.0000***) | 0.04 (0.5042) | 0.11 (0.0377*) | -0.11 (0.0332*) |

The CECS was relatively least connected with the other psychometric measures (Tab. IV). We found that people using the emotion-oriented style to solve life problems had a slightly higher level of suppressing negative emotions, while increased social contacts in difficult life situations resulted in slightly lower levels of suppressing negative emotions (Tab. IV). The level of suppressing negative emotions was dependent on the sense of coherence – the higher it was the lower the sense of coherence. However, these dependencies were very weak (Tab. IV). We demonstrated a correlation of the effect of symptoms of feeling unwell on the level of suppressing negative emotions, but its strength was negligible, hence it is impossible to draw any far-reaching conclusions on this basis (Tab. IV).

**Tab. IV. Correlations between CECS and other scales**

| | **CECS** | | | |
|---|---|---|---|---|
| | anger | depression | fear | all emotions |
| **CISS** | | | | |
| Task-oriented style (TOS) | -0.04 (0.5189) | -0.09 (0.1124) | -0.04 (0.4207) | -0.07 (0.1893) |
| Emotion-oriented style (EOS) | 0.02 (0.6837) | 0.22 (0.0000***) | 0.18 (0.0010***) | 0.15 (0.0068**) |
| Avoidance-oriented style (AOS) | -0.10 (0.0614) | -0.14 (0.0104*) | -0.21 (0.0001***) | -0.18 (0.0008***) |
| Distraction (D) | 0.00 (0.9798) | 0.01 (0.9140) | -0.09 (0.1139) | -0.03 (0.5345) |
| Social diversion (SD) | -0.20 (0.0003***) | -0.22 (0.0001***) | -0.27 (0.0000***) | -0.27 (0.0000***) |
| **SOC-29** | | | | |
| Comprehensibility | -0.08 (0.1670) | -0.18 (0.0010**) | -0.11 (0.0371*) | -0.14 (0.0104*) |
| Manageability | -0.07 (0.2206) | -0.21 (0.0001***) | -0.13 (0.0164*) | -0.15 (0.0045**) |

| | | | | |
|---|---|---|---|---|
| Meaningfulness | -0.07 (0.1998) | -0.23 (0.0000***) | -0.18 (0.0006***) | -0.18 (0.0007***) |
| Coherence | -0.08 (0.1421) | -0.24 (0.0000***) | -0.17 (0.0019**) | -0.18 (0.0007***) |
| **GHQ-28** | | | | |
| Somatic symptoms | 0.05 (0.3299) | 0.15 (0.0063**) | 0.04 (0.5157) | 0.08 (0.1435) |
| Anxiety insomnia | 0.05 (0.3383) | 0.15 (0.0060**) | 0.06 (0.3118) | 0.08 (0.1246) |
| Social dysfunctions | 0.07 (0.1931) | 0.11 (0.0427*) | 0.11 (0.0407*) | 0.09 (0.0821) |
| Depression symptoms | 0.07 (0.2115) | 0.17 (0.0013**) | 0.13 (0.0191*) | 0.13 (0.0187*) |
| GHQ | 0.06 (0.2798) | 0.17 (0.0017**) | 0.07 (0.2205) | 0.10 (0.0724) |

Strong correlations between anxiety and coherence are presented in Table V.

**Tab. V. Correlations between SOC-29 and other scales**

| | **SOC-29** | | | |
|---|---|---|---|---|
| | Comprehensibility | Manageability | Meaningfulness | Coherence |
| **STAI** | | | | |
| State anxiety (X-1) | -0.41 (0.0000***) | -0.51 (0.0000***) | -0.48 (0.0000***) | -0.54 (0.0000***) |
| Trait anxiety (X-2) | -0.52 (0.0000***) | -0.61 (0.0000***) | -0.61 (0.0000***) | -0.67 (0.0000***) |
| **CISS** | | | | |
| | Comprehensibility | Manageability | Meaningfulness | Coherence |
| Task-oriented style (TOS) | 0.25 (0.0000***) | 0.31 (0.0000***) | 0.29 (0.0000***) | 0.33 (0.0000***) |
| Emotion-oriented style (EOS) | -0.54 (0.0000***) | -0.48 (0.0000***) | -0.43 (0.0000***) | -0.56 (0.0000***) |
| Avoidance-oriented style (AOS) | -0.14 (0.0081**) | -0.05 (0.3445) | -0.02 (0.7777) | -0.08 (0.1561) |
| Distraction (D) | -0.22 (0.0000***) | -0.19 (0.0005***) | -0.16 (0.0028**) | -0.21 (0.0001***) |
| Social diversion (SD) | 0.13 (0.0122*) | 0.23 (0.0000***) | 0.26 (0.0000***) | 0.24 (0.0000***) |
| **SOC-29** | | | | |
| anger | -0.08 (0.1670) | -0.07 (0.2206) | -0.07 (0.1998) | -0.08 (0.1421) |
| depression | -0.18 (0.0010**) | -0.21 (0.0001***) | -0.23 (0.0000***) | -0.24 (0.0000***) |
| fear | -0.11 (0.0371*) | -0.13 (0.0164*) | -0.18 (0.0006***) | -0.17 (0.0019**) |
| all emotions | -0.14 (0.0104*) | -0.15 (0.0045**) | -0.18 (0.0007***) | -0.18 (0.0007***) |
| **GHQ-28** | | | | |
| Somatic symptoms | -0.27 (0.0000***) | -0.30 (0.0000***) | -0.31 (0.0000***) | -0.33 (0.0000***) |

| | | | | |
|---|---|---|---|---|
| Anxiety insomnia | -0.33 (0.0000***) | -0.33 (0.0000***) | -0.34 (0.0000***) | -0.39 (0.0000***) |
| Social dysfunctions | -0.23 (0.0000***) | -0.24 (0.0000***) | -0.27 (0.0000***) | -0.28 (0.0000***) |
| Depression symptoms | -0.30 (0.0000***) | -0.31 (0.0000***) | -0.35 (0.0000***) | -0.37 (0.0000***) |
| GHQ | -0.34 (0.0000***) | -0.36 (0.0000***) | -0.38 (0.0000***) | -0.41 (0.0000***) |

The level of coherence was related to the problem-solving method – negatively with the emotional approach, and positively with the task approach. The higher the level of negative emotions, the lower the sense of coherence; dependencies for most scales were statistically significant, but their strength was insignificant (Tab. V). Whereas, the overall coherence level was clearly correlated with the occurrence of symptoms of feeling unwell. Correlations were negative, and the strongest relationships concerned the total GHQ-28 score and overall sense of coherence. In the next stage of analysis, we collected the correlations between STAI, CECS, CISS, and SOC-29 with the measures obtained with the GHQ-28 (Tab. V).

The aim of the analysis was to also find a model that would enable estimating the level of anxiety experienced by nursing staff. Separate models were constructed for both components – anxiety (state) and anxiety (trait). Potential factors affecting anxiety level include: variables characterizing the demographic and occupational status of nurses (age, place of residence, education, department/ward, position) and values of other selected psychometric measures (i.e. sense of coherence, SOC-29, and other measures). Using the stepwise regression procedure, we selected an optimal model that would have a high determination coefficient value and only contained statistically significant factors. After applying the stepwise regression procedure, a model with five independent factors was selected. None of the qualitative features describing demographic and professional status were found to be statistically significant. The model included two measures of coherence, two CISS measures, and the overall score on the GHQ. In total, the factors considered in the model made it possible to explain about 41% of the variability of temporary feelings of anxiety (X-1). Feelings of anxiety increased with a decrease in the levels of manageability, meaningfulness, and less frequent use of the avoidance-oriented style (AOS) for coping with emotions and together with an intensification of the use of the emotion-oriented style (EOS) and greater health problems. Coefficients in column *B* showed how, on average, the anxiety level changed with changing the independent variable by 1 point. Results are shown in Tab. VI.

**Tab. VI. Correlations between GHQ-28 and other scales**

| | GHQ-28 | | | | |
|---|---|---|---|---|---|
| | Somatic symptoms | Anxiety insomnia | Social dysfunctions | Depression symptoms | GHQ |
| **STAI** | | | | | |
| State anxiety (X-1) | 0.30 (0.0000***) | 0.39 (0.0000***) | 0.28 (0.0000***) | 0.34 (0.0000***) | 0.40 (0.0000***) |
| Trait anxiety (X-2) | 0.37 (0.0000***) | 0.46 (0.0000***) | 0.37 (0.0000***) | 0.44 (0.0000***) | 0.48 (0.0000***) |
| **CISS** | | | | | |
| Task-oriented style (TOS) | -0.09 (0.1082) | -0.05 (0.3698) | -0.04 (0.4462) | -0.08 (0.1301) | -0.06 (0.2627) |
| Emotion-oriented style (EOS) | 0.32 (0.0000***) | 0.40 (0.0000***) | 0.29 (0.0000***) | 0.35 (0.0000***) | 0.42 (0.0000***) |
| Avoidance-oriented style (AOS) | 0.05 (0.3305) | 0.03 (0.5680) | -0.02 (0.6817) | -0.03 (0.5606) | 0.04 (0.5042) |
| Distraction (D) | 0.12 (0.0246*) | 0.09 (0.0875) | 0.00 (0.9433) | 0.04 (0.4279) | 0.11 (0.0377*) |
| Social diversion (SD) | -0.08 (0.1169) | -0.11 (0.0454*) | -0.07 (0.1646) | -0.17 (0.0011**) | -0.11 (0.0332*) |
| **CECS** | | | | | |
| anger | 0.05 (0.3299) | 0.05 (0.3383) | 0.07 (0.1931) | 0.07 (0.2115) | 0.06 (0.2798) |
| depression | 0.15 (0.0063**) | 0.15 (0.0060**) | 0.11 (0.0427*) | 0.17 (0.0013**) | 0.17 (0.0017**) |
| fear | 0.04 (0.5157) | 0.06 (0.3118) | 0.11 (0.0407*) | 0.13 (0.0191*) | 0.07 (0.2205) |
| all emotions | 0.08 (0.1435) | 0.08 (0.1246) | 0.09 (0.0821) | 0.13 (0.0187*) | 0.10 (0.0724) |
| **SOC-29** | | | | | |
| Comprehensibility | -0.27 (0.0000***) | -0.33 (0.0000***) | -0.23 (0.0000***) | -0.30 (0.0000***) | -0.34 (0.0000***) |
| Manageability | -0.30 (0.0000***) | -0.33 (0.0000***) | -0.24 (0.0000***) | -0.31 (0.0000***) | -0.36 (0.0000***) |
| Meaningfulness | -0.31 (0.0000***) | -0.34 (0.0000***) | -0.27 (0.0000***) | -0.35 (0.0000***) | -0.38 (0.0000***) |
| Coherence | -0.33 (0.0000***) | -0.39 (0.0000***) | -0.28 (0.0000***) | -0.37 (0.0000***) | -0.41 (0.0000***) |

The level of trait anxiety clearly depended on the factors indicated below, which were selected using the progressive stepwise regression procedure. Based on the model presented below, the variability of anxiety levels can be explained in over 73%. The psychometric factors affecting an increase in trait anxiety were: a lower sense of manageability and meaningfulness (from the SOC-29 scale), lower level of anger, decreased use of the task-oriented and avoidance-oriented styles of problem solving. The anxiety level also increased with the rise in the use of the emotion-oriented style of problem solving and higher levels of symptoms according to the GHQ. In addition, the anxiety level differed significantly between the groups

of nurses occupying different positions, in particular, a significant difference occurred between unit and ward nurses. The latter had higher levels of anxiety (on average by about -2.2 points), which could be conditioned by greater professional responsibility. The absolute values of standardized coefficients *ß* allowed to compare the impact of individual factors on the level of trait anxiety; the emotion-oriented style of problem solving had the greatest effect (definitely the highest *ß*), followed by the level of manageability (|*ß*| = 0.22). Results are shown in Tab. VII.

**Tab. VII. Statistics for the model for the variable: State anxiety**

| Result | Statistics for the model for the variable | | | | |
|---|---|---|---|---|---|
| | *B* | 95% c.i. | | *ß* | *p* |
| **State anxiety (X-1)** ***F* = 41.7 *p* = 0.0000*** $R^2$ = 41.2%** | | | | | |
| Manageability – SOC-29 | -0.23 | -0.37 | -0.09 | -0.21 | 0.0017** |
| Meaningfulness – SOC-29 | -0.22 | -0.38 | -0.07 | -0.19 | 0.0050** |
| Emotion-oriented style (EOS) | 0.23 | 0.12 | 0.34 | 0.22 | 0.0001*** |
| Avoidance-oriented style (AOS) | -0.20 | -0.31 | -0.09 | -0.16 | 0.0004*** |
| GHQ (general score) | 0.32 | 0.17 | 0.47 | 0.21 | 0.0000*** |
| **Trait anxiety (X-2)** ***F* = 73.1 *p* = 0.0000*** $R^2$ = 69.1%** | | | | | |
| Manageability – SOC-29 | -0.19 | -0.28 | -0.10 | -0.22 | 0.0000*** |
| Meaningfulness – SOC-29 | -0.17 | -0.27 | -0.07 | -0.17 | 0.0006*** |
| Task-oriented style (TOS) – CISS | -0.10 | -0.17 | -0.03 | -0.10 | 0.00814** |
| Emotion-oriented style (EOS) – CISS | 0.41 | 0.34 | 0.48 | 0.47 | 0.0000*** |
| Avoidance-oriented style (AOS) – CISS | -0.14 | -0.21 | -0.07 | -0.13 | 0.0002*** |
| GHQ (general score) | 0.25 | 0.16 | 0.34 | 0.19 | 0.0000*** |

## Discussion

In the current health care system, nurses are one of the most vulnerable occupational groups, and sources of stress include: poor organization of work; shift work disturbing the body's natural biological rhythm; non-rhythmic work, causing periodic increases in work burden; lack of satisfactory remuneration; lack of recognition from superiors; lack of professional development opportunities; job insecurity; and poor information flow on the team. It is worth noting the wide range of responsibilities related to the professional duties performed by nurses, the pressure of being reliable and available as well as the expectations of patients

and their families [14-17]. The nursing profession requires mental resilience, resistance to stress, and the ability to cope with difficult situations [18].

Averill believes that the diversity of human emotions is the result of having so-called mental programs of emotional responses to events [19,20]. A permanent personality trait is considered to be the ability to control (self-control) emotions, which is based on controlling one's own reactions so that their course is consistent with one's personal standards or remains in compliance with one's accepted social standards [13,21]. It should be remembered, however, that excessive suppression of persistent negative emotions leads to neurotic and psychosomatic disorders [13,21].

In a study of 100 nurses working in cardiology and intensive cardiac care departments, Gulag [22] found that they considered their work environment highly stressful. Over half of them exceeded the average stress levels, and its effects were manifested by somatic disorders [22]. Analyzing the study results in a group of 108 nurses working in pediatric wards in the Malopolska Voivodeship, Perek et al. [23] concluded that the reasons for difficult situations included: low earnings, responsibility for the patient's health and life, a disproportionate number of responsibilities in relation to the number of nurses, fear of committing an irreversible error, the possibility of infection, threat to personal safety, and lack of proper cooperation between professional groups. Difficult situations caused physical (neck and shoulder pains, heart palpitations, increased sweating) and mental reactions (fatigue and exhaustion, feelings of irritability and nervousness) in the studied nurses as well as changes in behavior (impulsiveness, hyperactivity, and conflictuality). Their strategies for coping with stress included use of constructive methods, consisting of making an effort to solve the problem through cognitive transformation or attempts to change the situation. The younger the nurse was, the stronger the emotion-oriented style, whereas with greater work experience the emotion-oriented strategy decreased [23].

In the current study, we found that nurses with a greater sense of anxiety more often solved problems using the emotional approach, and less often the task-oriented style; the more emotional the approach to problem solving was, the higher the level of anxiety. The psychometric factors affecting an increase in trait anxiety were: a lower sense of manageability and meaningfulness, lower levels of anger, decreased use of the task-oriented and avoidance-oriented styles of problem solving.

The literature on the subject emphasizes that depression combined with anxiety is an important psychological pathogenetic factor of the phenomenon of somatization and the cause

of such symptoms as persistent headaches, loss of appetite, excessive hunger, constipation, insomnia or monthly cycle disorders, for example [24]. The occurrence of these types of symptoms in nurses has been proven many times [24].

The current study shows that the worse the nurses felt, the stronger their anxiety was. There was also a small correlation of the effect of symptoms of feeling unwell on the level of suppressing negative emotions. Anxiety increased with a decrease in the levels of manageability and meaningfulness, less frequent use of the avoidance-oriented style for coping with emotions, with an intensification of the use of the emotion-oriented style, and greater health problems.

The literature emphasizes that emotional patterns are partly innate and develop and change as a result of life experiences, and their development can occur in two ways [18]. Firstly, as the creation of mental programs of emotions related to the rules and customs prevailing in the social environment, defining which feelings, when and by whom can be experienced. This allows experiencing emotions analogously to how others do it, and thus emotional reactions are adapted to social expectations, are understandable and fit the situations accepted by society [18]. Secondly, it consists of transforming programs of emotions corresponding to the rules prevailing in society so that they are consistent with one's individuality, thus the feeling of emotions is synchronized with personal psychological traits, values, and lifestyle [18]. A tendency to suppress emotions is considered to be typical of individuals who adhere to established principles, such as nurses, who are obliged to comply with the professional code on a daily basis [18]. It is emphasized that in certain situations and professional roles it is beneficial to strengthen negative emotions, such as when a doctor invokes sadness when informing a patient about an incurable disease [25].

A study by Kowalczuk et al. [26] in a group of 102 nurses from the Podlaskie Voivodeship showed that 72.6% of the nurses were exposed to stress in the workplace. Kliszcz et al. [27] studied 102 nurses and found a tendency to suppress negative emotions such as anxiety, anger, or depression. In a study of 50 nurses/midwives, Dziabek et al. [18] discovered that optimism had a protective function and effectively influenced the ability to express emotions, and as the level of optimism increased, they suppressed negative emotions. Kalandyk et al. [3], in a study of 570 nurses, observed that as job satisfaction increased, the level of negative emotions decreased. The strongest correlation was related to the sense of job security and depression levels as well as balancing work and family life and depression levels. The authors did not note statistically significant differences in these correlations between nurses

working in (district or voivodeship) hospitals or primary care facilities. Nurses suppressed anxiety (18.2±18) and depression (18.1±18) the most, and anger slightly less frequently (17.3±17) [3].

In the present study, people who suppressed depression and anxiety more, more often had an emotional approach to problem solving. The nurses that used the emotion-oriented style to solve life problems had a slightly higher level of suppressing negative emotions, while those who preferred increased social contacts in difficult life situations had slightly lower levels of suppressing negative emotions.

It is worth emphasizing that in the salutogenetic approach, health is on a dynamic health-disease continuum in which the current position of an individual largely determines the strength of his/her sense of coherence [9]. Kocięcka et al. [28], who studied 91 people, observed a statistically significant correlation between overall coherence level and its components (comprehensibility, manageability, and meaningfulness levels) and the health of the studied nurses. People with a high sense of coherence have significantly less symptoms (somatic disorders, anxiety, insomnia, social functioning, depression) than people with a low sense of coherence [28].

In the current study, strong correlations occurred between the level of coherence and the emotional approach to solving problems. The higher the level of negative emotions was, the lower the sense of coherence, and the higher the level suppressing negative emotions, the lower the coherence. However, these dependencies were very weak. Also the level of coherence was quite clearly connected with symptoms of feeling unwell. These correlations were negative, and the strongest relationships pertained to the total GHQ-28 score and overall sense of coherence.

Anxiety, as one of the elements of a difficult situation, is often present in the work of a nurse [29]. They work under the pressure of time. There are often unpredictable situations in their work, such as a sudden deterioration of the patient's condition or resuscitation, during which minutes decide about the patient's life. This leads to progressive fatigue and a decrease in work efficiency and to lowering the nurse's psychological comfort. There are also situations associated with a sense of lack of control, for example, when a nurse is caring for an unconscious or intubated patient, when it is not possible to speak with the patient and get feedback if the nurse's work has the intended results. A lack or reduction of control is an important factor that disturbs well-being and leads to emotional exhaustion. Relations with co-workers, patients and their families, which sometimes occur in an atmosphere of high emotional tension, can also create many problems. Due to the specifics of work in this professional group,

the 24-hour biological rhythm is disturbed, which also has negative health and emotional consequences [29].

In the present study, the level of anxiety differed significantly between the groups of nurses occupying different positions; ward nurses had higher anxiety levels.

The results of other studies as well as our own indicate that it is advisable to monitor activities reducing stress at work and teaching coping with negative emotions on the premises of health care institutions.

## Conclusions

- The level of anxiety differed significantly between the groups of nurses occupying different positions.
- Anxiety increased with a decrease in the levels of manageability and meaningfulness, less frequent use of the avoidance-oriented style for coping with emotions, an intensification of the use of the emotion-oriented style, and more health problems.
- A greater sense of coherence led to lower anxiety levels, and lower coherence resulted in higher levels of suppressing negative emotions.
- The worse the nurses felt, the stronger their anxiety was and more frequent use of the emotion-oriented style of coping.

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## QUOTES MOTIVATING TO WORK

“A man is a success if he gets up in the morning and gets to bed at night, and in between he does what he wants to do” – Bob Dylan

„An investment in knowledge pays the best interest” - Benjamin Franklin

„All life is an experiment. The more experiments you make the bette” - Ralph Waldo Emerson

„Anyone who stops learning is old, whether at twenty or eighty” - Henry Ford

“A successful man is one who can lay a firm foundation with the bricks others have thrown at him” – David Brinkley

“Develop an ‘attitude of gratitude’. Say thank you to everyone you meet for everything they do for you” – Brian Tracy

Doing what you like is freedom. Liking what you do is happiness” - Frank Tyger

“Don’t let yesterday take up too much of today” – Will Rogers

„Don’t wait. The time will never be just right” – Napoleon Hill

„Doubt is the father of invention” – Galileusz

„Education is the most powerful weapon which you can use to change the world” - Nelson Mandela

„Enjoy the inexorable pain” - quote for harvard students

„Even now, your enemies are eagerly flipping through books” - quote for harvard students

„Every time you smile at someone, it is an action of love, a gift to that person, a beautiful thing” - Mother Teresa of Calcutta

“I can’t give you a sure-fire formula for success, but I can give you a formula for failure: try to please everybody all the time” – Herbert Bayard Swope

“I find that the harder I work, the more luck I seem to have” – Thomas Jefferson

“I think goals should never be easy, they should force you to work, even if they are uncomfortable at the time.” – Michael Phelps

”It always seems impossible until it's done” - Nelson Mandela

“It has long since come to my attention that people of accomplishment rarely sat back and let things happen to them. They went out and happened to things” – Leonardo da Vinci

“It’s not whether you get knocked down, it’s whether you get up” – Vince Lombardi

„If you can dream it, you can do it” - Walt Disney

„If you don’t walk today, you’ll have to run tomorrow” - quote for harvard students

„If you fall asleep now, you will dream. If you study now, you will live your dream” - quote for harvard students

„It’s those who are earlier than the others, those who put in more effort, who can enjoy the feelings of success” - quote for harvard students

”It always seems impossible until it's done” - Nelson Mandela

“Knowing is not enough; we must apply. Wishing is not enough; we must do” – Johann Wolfgang von Goethe

„Life is not all about studying. But if you can’t even conquer this little part of life, then what else can you possibly do?” - quote for harvard students

„Live as if you were to die tomorrow. Learn as if you were to live forever" - Mahatma Ghandi

"Many of life's failures are people who did not realize how close they were to success when they gave up" – Thomas Edison

"Motivation is what gets you started. Habit is what keeps you going" – Jim Ryun

„No pain, no gain" - quote for harvard students

„Not everyone can truly succeed in everything. But success only comes with self-management and determination" - quote for harvard students

"Opportunities don't happen, you create them" – Chris Grosser

"People who are crazy enough to think they can change the world, are the ones who do" – Rob Siltanen

„People who invest in the future are realist" - quote for harvard students

"Success in business requires training and discipline and hard work. But if you're not frightened by these things, the opportunities are just as great today as they ever were" – David Rockefeller

"Success is how high you bounce when you hit bottom" – George S. Patton

"Success is just a war of attrition. Sure, there's an element of talent you should probably possess. But if you just stick around long enough, eventually something is going to happen" – Dax Shepard

"Success is not final, failure is not fatal: it is the courage to continue that counts" – Winston Churchill

"Success seems to be connected with action. Successful people keep moving. They make mistakes, but they don't quit" – Conrad Hilton

"Success? I don't know what that word means. I'm happy. But success, that goes back to what in somebody's eyes success means. For me, success is inner peace. That's a good day for me" – Denzel Washington

„Setting goals is the first step in turning the invisible into the visible" - Tony Robbins
„Studying is not about time. It's about effort" - quote for harvard students

"The effective leader recognizes that they are more dependent on their people, than they are on them. Walk softly" - Brian Tracy

"The first step toward success is taken when you refuse to be a captive of the environment in which you first find yourself" - Mark Caine

"The future belongs to competent. Get good, get better, be the best" – Brian Tracy

"The man who has confidence in himself gains the confidence of others" – Hasidic proverb

"The no. 1 reason people fail in life is because they listen to their friends, family, and neighbors" - Napoleon Hill

"The only way to do great work is to love what you do. If you haven't found it yet, keep looking. Don't settle" – Steve Jobs

"The pessimist sees difficulty in every opportunity. The optimist sees opportunity in every difficulty" - Winston Churchill

"The successful warrior is the average man, with laser-like focus" – Bruce Lee

"The way to get started is to quit talking and begin doing" – Walt Disney

"Those who dare to fail miserably can achieve greatly" – John F. Kennedy

"Today's accomplishments were yesterday's impossibilities" – Robert H. Schuller

„Tell me and I forget. Teach me and I remember. Involve me and I learn" - Benjamin Franklin

„The important thing is not to stop questioning" – Albert Einstein

„The level of education is in direct correlation with your salary" - quote for harvard students

„The pain of studying is only temporary. But the pain of not knowing – ignorance – is forever" - quote for harvard students

„The saliva that flow now will become the tears of tomorrow" - quote for harvard students

„There are no secrets to success. It is the result of preparation, hard work, and learning from failure" - Colin Powell

„Time is flying" - quote for harvard students

"We generate fears while we sit. We overcome them by action" – dr. Henry Link

"Whether you think you can or think you can't, you're right" – Henry Ford

"You don't have to be great to start, but you have to start to be great" – Zig Ziglar

"You learn more from failure than from success. Don't let it stop you. Failure builds character" – unknown

"You miss 100 percent of the shots you never take" – Wayne Gretzky
"You're not obligated to win. You're obligated to keep trying. To the best you can do everyda." – Jason Mraz
„We don't grow when things are easy, we grow when we face Challenges" - Joyce Meyer

„Whatever you are, be a good one" – Abraham Lincoln

„When today is over, it will never come back" - quote for harvard students

„When you think it's too late, the truth is, it's still early" - quote for harvard students

„You cannot leave everything to Fate, boy. She's got a lot to do. Sometimes you must give her a hand" - Leonardo da Vinci.

„You will never know everything about anything" - Julia Child

„You will never win if you never Begin" - Helen Rowland

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