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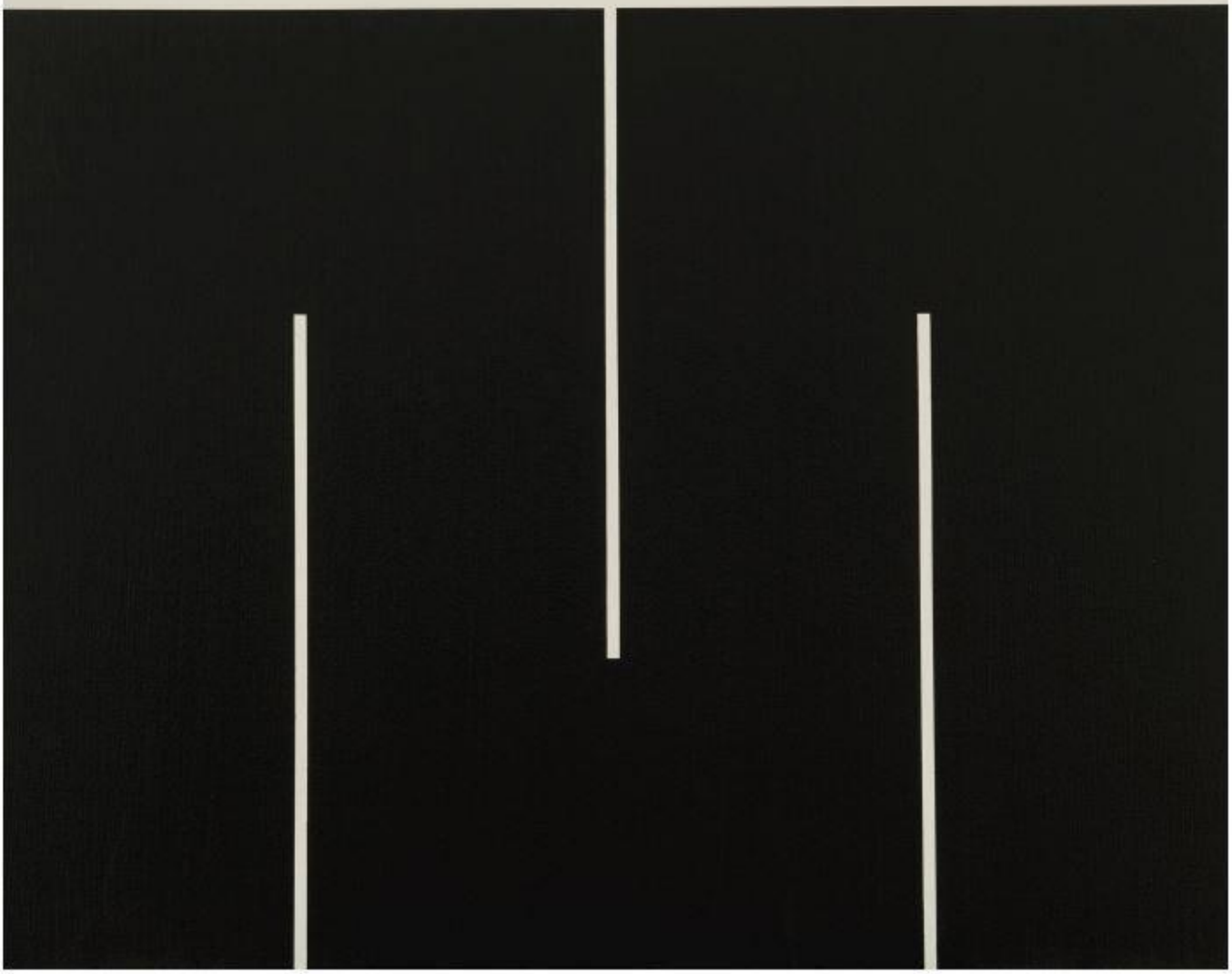

JULIJE KNIFER

AP XP

AKRILIK NA PLATNU, 2003.
umjetnička slika

Josip Juraj Strossmayer University of Osijek
Faculty of Medicine

Editorial

Dear colleagues,

I am happy to present you with the new issue of Southeastern European Medical Journal (SEEMEDJ 2018;(2):1:1-58). This is the fourth number in the second year of journal publication and it is devoted to nursing.

This issue brings papers from Croatian authors- nurses from various fields. The review by Mikšić et al. is on the theory of unpleasant symptoms and the concept of nursing support, This theory helps in planning nursing interventions and facilitates healthcare delivery in general.

Authors Batrnek et al. provide original research on comorbidities of posttraumatic stress disorder and alcohol dependence in more than 150 patients, with findings on increased divorce rate and alcohol consumption with the prescribed therapy in this population.

Two other papers are concerned with the problems of stress in nurses in the surgery intensive care units (Pačarić et al, Work-related Stress and Most Common Stressors for Surgical Nurses and Pačarić et al, Emotional Control in Surgical and Intensive Care Nursing: Sociodemographic Differences). Both papers are original research papers with important results on burdens and management of stress in nurses, while paper by Maceković M and Prlić N. provides information on the attitudes of health care professionals on the importance of public health nurses' education.

Finally, the paper by Raza and Miedany (UK) brings the comprehensive review on giant cell arteritis and an attempt to identify the standard of care in individuals with suspected giant cell arteritis in a typical district general hospital and to offer a proposed pathway for treatment of the disease.

It is important to mention the art work at the cover page of this issue. It is a painting by Julije Knifer "AP XP" from the Museum of Fine Arts in Osijek (selected by Ms Valentina Radoš, senior curator). Julije Knifer (born in Osijek) was our fellow citizen, renowned Croatian writer and painter.

On behalf of editorial board and my own, I warmly greet our readers and invite them to join us in the endeavour of publishing own scientific work in SEEMEDJ.

Sincerely,

Ines Drenjančević, MD, PhD
Editor-in-Chief
Southeastern European Medical Journal (SEEMEDJ)

Original article

Emotional Control in Surgical and Intensive Care Nursing: Sociodemographic Differences

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Abstract

Aim: To determine whether there is a difference in the impact of emotion on memory, behaviour, thinking and mood with regard to age, gender, level of education and length of service.

Methods: Research included 105 nurses. It was conducted anonymously by a standardized Emotional Regulation and Control Questionnaire (ERIK).

Results: Average rating on the scale was somewhat lower for men, respondents under 30 years of age and respondents with a university degree. Average rating on the emotional regulation and control scale were significantly higher for respondents with 31 and more years of service (Kruskal-Wallis test, p=0.046). Regarding male respondents, there is a significant correlation of age (Spearman's correlation coefficient, =0.429, p=0.020) and length of service (Spearman's correlation coefficient, =0.412, p=0.026) with their overall score on the scale. Regarding female correspondents, there is no significant correlation between age and their overall score on the emotional regulation and control scale and sub-scales. Considering the age of respondents, results indicate that the decrease in the ability to control emotional reactions is proportional to the increase in age, but not to a significant degree. Regarding elderly respondents, the value of emotional regulation and control is higher in comparison to younger respondents (Spearman's correlation coefficient, =0.440, p=0.017).

Conclusion: Increase in length of service decreases the ability to control emotional reactions and there are no significant differences in emotional control with regard to gender, age and educational background.

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KEYWORDS: emotional intelligence, self-control, nurses, thinking

Introduction

Emotional intelligence is defined as the ability to monitor one's own and other's emotions and as the ability to perceive, assess and express emotional information by creating feelings for emotional and intellectual development (1). As such, it has an indirect role between mental health and stress. People with a higher level of emotional intelligence have a greater ability to deal with conflicts and the environment than people with a lower level of emotional intelligence (2). Emotional intelligence is composed of five main elements: self-awareness, self-regulation, internal motivation, empathy and social skills. These five elements of emotional competence have been defined as levels built one on another, which ultimately represent emotional intelligence as a whole (3). Pence (4) points out that emotional intelligence can help nurses in managing their own and patient's emotions; it reflects a real emotional reaction, where feelings and communication are exchanged during nurse-patient interaction. Nursing is considered an emotionally demanding job because nurses are required to cope with various emotional demands and affective behaviours in their work-related relationships, be it with their patients, relatives or colleagues (5). Emotions play an important role in the nursing practice and in order to understand and manage them, they first must be properly identified. Even though this sounds simple, it is often rather difficult to accomplish. Nurses can desire to express their emotional states, yet they should minimize their display. This can make them appear inauthentic and thus produce a negative effect on both the provision of optimal nursing care and the nurse-patient relationship (6). The problem of work burnout can cause emotional stress, emotional burnout, depersonalization, feeling of failure, stress-related illnesses, demotivation and dissatisfaction with care, reduced quality of care and conflicts with other team members and patients (7). Putting on one's professional face highlights the need of nurses to use a "mask" to control their emotional states and to maintain their professional persona whilst caring for patients (8).

In the last decade, there has been an increase in the interest for the implementation of programs aimed at developing social and emotional skills, such as problem-solving, decision-making, communication skills, recognition of own and others' emotions, control of emotions, control of one's own behaviour and so on (9). Emotional regulation relates to the ability of managing one's own emotions in situations when particular emotions are unfavourable, occur at inconvenient times or when their intensity is inappropriate (10).

Emotional regulation relates to heterogeneous processes that regulate which emotions we feel, when we feel them and how we experience and express them. There is a consensus among researchers that emotions have more components in an experiential, behavioural and physiological domain. Emotional regulation involves a change in one or more of these systems and does not need to (but it certainly can) include attempts to change the subjective experience of emotions (11). Research has shown that the ability of emotional self-regulation can help in coping with emotional demands of jobs (12). Emotional regulation is a new research area that provides nurses with an opportunity to explore their value and become more efficient in managing stressful situations in the working environment and improving the full range of nursing practice (13).

Objectives of this research are to determine whether there is a difference in the impact of emotion on memory, behaviour, thinking and mood with regard to age, gender, level of education and length of service.

Respondents and Methods

Research subjects were 105 nurses employed at the Department of Surgery in intensive care units and operating rooms at the Clinical Hospital Osijek. Of 105 respondents, 29 (28%) were men and 76 (72%) were women. Most respondents – 79 (76.7%) of them – had secondary school qualifications. The mean age of respondents

was 38 years, whereas the average length of service was 16.5 years.

Research was conducted during May and June 2015 and it included nurses holding the position of operating nurse in the operating room and the position of intensive care nurse at the Department of Surgery of the Clinical Hospital Osijek. The respondents were informed about emotional assessment and control in nursing in both written and oral form. They read the form/questionnaire related to the research and were introduced to the research process. Introduction to research included a presentation of basic information about the research, main objective, manner of carrying out the research, confidentiality and data protection. The survey was voluntary and anonymous. The Ethics Committee of the Clinical Hospital Osijek granted its consent to conduct the research. Completed forms/questionnaires were submitted personally in an envelope in order to ensure anonymity.

A standardized Emotional Regulation and Control Questionnaire was used upon permission from the author Vladimir Takšić. The questionnaire assessed the impact of unpleasant emotions and mood on thinking, memory and behaviour of individuals. The questionnaire consisted of 20 items that assessed the size of the effects of negative emotions and moods on thinking, memory and behaviour of the individual and on the ability of emotional control (Takšić, V.: Emotional Regulation and Control Scale, ERIK, 2003) (14). The subjects rated 20 statements about emotional regulation and control from 1 to 5 on the Likert scale, where 1 was (not at all), 2 (seldom), 3 (occasionally), 4 (mostly) and 5 (completely). The first part consisted of statements related to the effects of emotions and mood on thinking and behaviour (8 statements), followed by statements related to the memory of emotionally saturated contents (6 statements) and to statements related to control of their own emotional reactions (6 statements). Higher scores indicated poorer emotional regulation and control. The second part of the questionnaire contained general information about sociodemographic characteristics (age, gender, length of service, qualifications).

Statistical methods

The figures were described by median and interquartile range. Categorical variables were described in absolute and relative frequencies. Fisher's exact test and Mann-Whitney test were used to determine the differences between independent groups (age, gender, education). The level of significance was set at α = 0.05. The analysis of the data obtained was done by a programming system SPPS for Windows (version 13.0).

Results

The study included 105 respondents, of which 29 (28%) were men and 76 (72%) were women. The respondents' ages ranged from 24 to 64, their mean age was 38 (an interquartile range of 30-48 years) and 5 (4.9%) respondents had a university degree. Average length of service was 16.5 years (an interquartile range of 8-26 years), ranging from 1.5 to 45 years of service, with no significant differences in gender (Table 1).

Table 1. Respondents by characteristics and gender

	Men	Women	Total	p
Total	29 (28%)	76 (72%)	105 (100%)	
Age*	40 (28 – 49.5)	38 (31.5 – 47)	38 (30 – 48)	0.985†
Length of service*	19 (7.5 – 28)	16 (8.5 – 25)	16.5 (8 – 26)	0.894†
Level of education				
High school degree	24 (82.8%)	55 (74.3%)	79 (76.7%)	
Higher education	4 (13.8%)	15 (20.3%)	19 (18.4%)	0.770‡
University degree	1 (3.4%)	4 (5.4%)	5 (4.9%)	
Age				
– 30 years	10 (34.5)	16 (21.1)	26 (24.8)	
31 – 40	6 (20.7)	27 (35.5)	33 (31.4)	0.348‡
41 – 50	8 (20.7)	23 (30.3)	31 (29.5)	
51 years and above	5 (17.2)	10 (13.2)	15 (14.3)	
Length of service – by groups				
up to 10 years	11 (37.9)	20 (26.3)	31 (29.5)	
11 – 20	5 (17.2)	26 (34.2)	31 (29.5)	0.286‡
21 – 30	8 (27.6)	22 (28.9)	30 (28.6)	
31 and above	5 (17.2)	8 (10.5)	13 (12.4)	

*Median (interquartile range); †Mann-Whitney test; ‡2 test

Average rating on the scale was somewhat lower for men, respondents under 30 years of age and respondents with a university degree. However, the differences with regard to gender, age and educational background were not that significant.

Average ratings on the emotional regulation and control scale were significantly higher respondents with the length of service of 31 years or more (Kruskal Wallis test, p = 0.046) (Table 2).

Table 2. Average ratings on the scales and subscales in the Emotional Regulation and Control Questionnaire by gender, age, level of education and length of service*

	Median (25% - 75%)			
	The impact of emotions and mood on thinking	**The impact of emotions and mood on memory**	**Control of emotional reactions**	**The whole scale**
Gender				
Men	2.5 (2.2–2.9)	2.7 (2.4–3.3)	2.5 (2.2–3.1)	2.6 (2.4–3.2)
Women	2.7 (2.3–3)	3 (2.5–3.3)	2.3 (2–2.8)	2.7 (2.4–3.0)
p value*	0.860	0.560	0.138	0.649
Age				
– 30 years	2.4 (2.2-2.9)	3 (2.7-3.4)	2.2 (2-2.5)	2.5 (2.3-2.9)
31 – 40	2.5 (2.1-2.9)	3 (2.7-3.3)	2.3 (2-3)	2.7 (2.3-3)
41 – 50	2.8 (2.4-3.3)	2.8 (2.5-3.3)	2.5 (2-3)	2.8 (2.5-3.1)
51 and above	2.4 (2.1-3.4)	2.8 (2.3-3.3)	2.7 (2.3-3.3)	2.7 (2.4-3.4)
***p value**†*	0.308	0.838	0.220	0.440
Level of education				
High school degree	2.6 (2.3-3)	3 (2.6-3.3)	2.3 (2.2-3)	2.7 (2.3–3)
Higher education	2.6 (2.1-3)	3.2 (2.7-3.3)	2.3 (2-2.8)	2.6 (2.3–3.1)
University degree	2.3 (1.9-3.1)	2.5 (2.1-3.3)	2.2 (1.8-3.1)	2.2 (1.9–3.2)
***p value**†*	0.695	0.344	0.655	0.525
Length of service				
up to10 years	2.5 (2.1–2.9)	3 (2.7–3.3)	2.2 (2–2.5)	2.5 (2.3–2.8)
11 – 20	2.6 (2.3–3.1)	3.2 (2.7–3.5)	2.5 (2.2–3.2)	2.8 (2.4–3.1)
21 – 30	2.8 (2.4–3.2)	2.9 (2.3–3.3)	2.5 (1.9–3)	2.7 (2.4–3.1)
31 years and above	2.4 (2.2–3.3)	2.7 (2.4–3.3)	2.7 (2.3–3.3)	2.6 (2.4–3.4)
***p value**†*	0.332	0.539	**0.046**	0.184

*Mann-Whitney test; †Kruskal-Wallis test

In the group of men, there is a significant correlation between age (Spearman's correlation coefficient, = 0.429, p = 0.020) and the length of service (Spearman's correlation coefficient, = 0.412, p = 0.026) with their overall score on the scale. In comparison to younger respondents, older respondents agreed mostly or entirely with the statements. Regarding elderly respondents, control of emotional reactions was rated higher when compared to the ratings given by younger respondents (Spearman's correlation coefficient, = 0.440, p = 0.017).

Regarding female correspondents, there was no significant correlation between age and their overall score on the emotional regulation and control scale and sub-scales.

Discussion

Mood affects work-effectiveness of nurses (15). Some authors have stated in their studies that people with a low level of positive emotions suffer from emotional exhaustion, which is one of the elements of burnout and the development of psychosomatic disorders and physical illnesses (16). Nurses are usually asked to provide care in an unemotional manner, without demonstrating any emotional response to the pain; they have to be able to buffer their emotions, and to focus on medical care (17). If we consider the impact of emotions and mood on thinking and memory by gender, the results indicate that said impact received a higher average grade on the Likert scale from women than from men. This suggests that emotions have a greater impact on opinion and memory in women than in men, although those differences are not significant. Men and women use different sides of their brains to process and store long-term memories (18). The results also indicate that emotions have a greater impact on memory in women, in the sense that women remember negative emotions more than men do. These differences may be attributed to various genetic, hormonal and environmental factors. Both sexes are equal in intelligence, but tend to operate differently. Men and women appear to use different parts of the brain to encode memories, sense emotions, recognize faces, solve certain problems and make decisions (19).

If we consider the age of respondents, there was no significant difference in the impact of emotions and mood on memory. However, it can be said that increase in age decreases the impact of emotions and mood on memory among nurses. There is a significant correlation between age and length of service, which is understandable because nurses who have been working longer are older. Results indicate that the decrease in the ability to control emotional reactions is proportional to the increase in age, but not to a significant degree.

Regarding educational qualifications, the results indicate that the higher the level of education, the lower the impact of emotions and mood on thinking and memory. This means that people who are more educated can control emotional reactions better, but the differences are also not that significant. We know that emotional regulation is a complex construct which is from an educational perspective seen as an ability to use appropriate strategies in a particular context. Therefore, it is presumed that emotional control can be learned and that education and practice must be combined (20). Through the self-awareness process, nursing students can become aware of the importance of taking care of their own emotional health. Furthermore, they can also learn how to effectively cope with complex interactions with their patients and colleagues (20).

Emotional regulation or control of allows people to comfort themselves and relieve anxiety, depression or irritability (21). Emotional regulation includes managing of unpleasant emotions and emotional reactions, analysis of the causes of such emotions, choice of reaction and the ability to postpone fulfilment of a particular desire or need. In that sense, it determines the external behaviour of individuals and internal well-being (22). Some scholars have discovered that emotional self-regulation can help nurses in recognizing and responding to patients' emotions in an empathic manner, which enables them to provide better nursing care (23). However, as the number of years of

service in the nursing profession increases, the level of nurses' empathy decreases (24), which is also true for people working in the same department for a long period of time. Results of a study in Tehran have shown that length of service is related to continuance commitment and occupational commitment (25).

When it comes to the impact of emotions and mood on the control of emotional reactions, the majority of respondents rated their emotional control on the Likert scale as average. When people are in a good mood, they evaluate life in general as successful and fulfilled and they are more likely to remember positive events in their lives. In contrast, when they are in a bad mood, then such mood also affects their motivation, behaviour and everyday interactions (26). People in a good mood are nicer to other people, more generous and more willing to help. They are also more open to new activities and ideas and more creative than people in a bad mood (27). Healthcare workers who are more competent in recognizing emotions and needs of patients are much more successful in taking care of themselves (28). Average ratings on the scale were somewhat lower for men, respondents under 30 years of age and respondents with a university degree. However, the differences with regard to gender, age and educational background are not that significant.

Conclusion

Average ratings on the emotional regulation and control scale were significantly higher for respondents with 31 or more years of service. It has also been discovered that nurses with the shortest length of service are the least active in coping with problems, as well as that their competence increases with length of service (29).

Taking into consideration the demands of the nursing profession, it can be concluded that the possession of emotional intelligence and control is an imperative for successful professional activities. Nurses should attend training programs that also include communication skills programs. It is also necessary to help nursing staff in adopting constructive emotional regulation strategies so that they could manage their and others' emotions and apply such strategies in their work. Nurses with better emotional regulation skills are more motivated to work and to take care of their well-being at home in situations when they have to face emotionally demanding situations at work, which indicates a spillover effect (30).

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Disclosure

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Competing interests. None to declare

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Original article

Comorbidity of Posttraumatic Stress Disorder and Alcohol Dependence

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Abstract

Aim: The aim of the research was to examine the extent to which alcohol dependence occurs in comorbidity with PTSD.

Methods: The study included 165 respondents hospitalized at the Department of Psychiatry in Osijek. All respondents were previously diagnosed with PTSD. The overall questionnaire was designed specifically for this study, and it included information about age, gender, education, psychological problems, the continuum of treatment, and questions about alcohol consumption.

Results: Most of the patients live with their wives and children: 34 (54%) of them from the 2004 study, and 40 (39.2%) of them from the 2014 study. Also, 72.1% of the patients who responded to the questionnaire have family support. The marital status of the patients differed significantly over the years (χ^2 test; p = 0.007). Results show that 35.2% consume alcohol daily. Furthermore, there are significantly more patients who don`t consume alcohol with the prescribed therapy (χ^2 test; p = 0.042).

Conclusion: More than one third of the patients diagnosed with PTSD have alcohol dependence. The number of people diagnosed with PTSD and alcohol dependence increased in 2014 when compared to the 2004 findings, including the number of divorces and the consumption of alcohol with the prescribed therapy.

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KEYWORDS: alcoholism, comorbidity, PTSD, nursing care

Introduction

Several years after the Croatian War of Independence ended, Croatia started to face its consequences, one of them being the rising number of war veterans, which totals up to around 27 000. A problem in particular are the disabled war veterans who suffer from posttraumatic stress disorder (PTSD). It is not just a private problem, but also a social one because veterans experience problems with the performance of daily work tasks, family problems, problems with relationships, and problems with everybody around them. In some cases, it is even possible to develop a dependence on alcohol or drugs (1). Long-term effects of trauma are present within the psychological, social, and biological level. Whether people will overcome their traumatic experiences or develop some of the pathological responses to trauma depends on the characteristics of their own trauma, personality characteristics, and the quality of social support (2).

Posttraumatic stress disorder

Posttraumatic stress disorder is defined as a pathological anxiety that usually develops after an individual experiences or witnesses severe trauma. Initially, a person responds with intense fear, helplessness and horror. Later, the disorder develops a response to an event marked by persistent reenactment of events and symptoms of emotional numbness, avoidance and hyperarousal. PTSD can be acute, chronic and delayed (3). War itself contains probably the largest number of some of the most powerful provoking factors. When people fight in war, they must give up on their moral standards which are necessary to sustain civilized life (4). The symptoms and the fully developed clinical picture of PTSD can occur immediately after a stressful event or shortly thereafter, but the initial symptoms and psychological problems may occur many years after the trauma had occurred. A person usually develops anxiety and depression immediately after experiencing a trauma. The most important characteristic of PTSD is constantly re-experiencing the traumatic event. The patient usually faces incentives from the environment, as well as some agonizing and unwanted memories of the traumatic event. These intrusive memories are accompanied by a corresponding painful, emotional reaction. The patient may suddenly begin to behave or feel as if the traumatic eventis re-occuring. They try to avoid thoughts or feelings associated with the trauma, or the activities and situations which can remind them of the trauma. PTSD can cause sleep disturbances, excessive tension, hypersensitivity, and some problems with concentration and reactions marked by excessive fear. Also, PTSD can cause aggressive reactions of variable intensity. The treatment of PTSD is a combination of drug treatment and psychotherapy. When a traumatic event is weaker, the intensity and the psychological reactions are less expressed, hence there is no need for therapeutic intervention, except for social support. In situations where the same person is experiencing several consecutive traumatic events, they require support from their families and friends, and only in certain situations an expert-centered aid. Group psychotherapy plays a central role in the psychiatric treatment of patients with PTSD (5). The aim of psychotherapy is to reduce the severity of symptoms and to gain more mature adaptive mechanisms. This provides better integration and reintegration into the family, as well as the social environment. During such group sessions, therapists work hard to establish trust, safety, and respect, and they encourage psychoeducation, altruism, acceptance, exposure of a traumatic experience and interpersonal learning (6).

Alcohol dependence

Alcoholism is a progressive, fatal disease characterized by a loss of control of drinking alcoholic beverages, an obsession with alcohol, and a denial of the link between alcohol consumption and deterioration of health and life chances (7, 8). Alcoholism can also be defined as a state with active signs and symptoms of excessive drinking of alcoholic beverages, including increased tolerance to alcohol and

behavioral changes (9). Alcohol causes reduction of concentration, vision, the ability to differentiate between the light stimuli, as well as alertness and attention. Alcoholics are used to drinking alcohol in order to cover up their negative feelings of anger, guilt and depression. The consequences of a long-term alcohol consumption are manifested through fatal damagings to many organ systems, as well as mental disorders. Gradually, alcohol dominates their thoughts, feelings and actions (10). The diagnosis of alcohol dependence can only be set if three or more of the following criteria are observed during the previous year: a strong desire or urge to drink, difficulties in self-control if a person tries to quit drinking, a physiological state of abstinence, an evidence of tolerance, such as increasing the amount of alcohol required to achieve effects which were previously caused by a small amount, a progressive negligence of alternative pleasures, or interests caused by drinking and continuation of alcohol consumption despite clear evidence of its adverse effects. The goal of the treatment is to establish and maintain permanent abstinence from alcohol, as well as to change the lifestyle and the value systems which led to excessive alcohol consumption in the first place. The treatment should include the patient's family, because alcoholism is often a family problem (3).

Comorbidity of posttraumatic stress disorder and alcohol dependence

Additional diagnoses may affect the patients' treatment during their stay in the hospital, namely in terms of the need for diagnostic tests, nursing care, and monitoring. Additional diagnoses may also affect the already provided nursing care and cause a significant increase in costs and a longer stay in the hospital (11). Posttraumatic stress disorder can occur in comorbidity with other mental and/or physical disorders. Comorbidity occurs in 80% of the cases (12). PTSD often co-occurs with alcoholism, depressive disorders, addictions to psychoactive substances, and personality disorders (13). There wasn`t much therapy and rituals for the majority of Croatian veterans as for the veterans of other wars. The lack of social care and support, especially the latter notion, left many Croatian war veterans unexperienced in terms of returning and, in actuality, unable to ever fully return from the war (4).

A nurse working with PTSD patients has an important role in the preservation of their personal and social integrity. The most important interventions are psychosocial support, education, and counseling. Education and psychosocial support help the patient and his/her family to deal with the disease and to change the patient's lifestyle, namely in a way to cope with the changes in the pattern of daily activities, which ultimately contributes to improving the quality of life. Although the development of PTSD depends on many factors, the education of nurses plays an important role both in its treatment and prevention. Through education we raise the level of knowledge of traumatized people about the disorder itself, its symptoms, and the subsequent behavior. Nurses provide support to patients and they encourage patients to talk with their families and friends about traumatic experiences (14).

The aim of the research of comorbidity of posttraumatic stress disorder and alcohol dependence was to examine the extent to which alcohol dependence occurs in comorbidity with PTSD.

Objective and methods

The study was structured retrospectively, namely on the basis of the criteria for inclusion of the PTSD-diagnosed subjects listed in the medical documentation. PTSD was previously diagnosed by a psychiatrist. The study included 165 patients hospitalized at the Department of Psychiatry in Osijek. 63 patients were hospitalized in 2004, whereas 102 were hospitalized in 2014. In the medical documentation of the subjects diagnosed with PTSD, all comorbidity was sought and the focus was on the diagnosis of alcoholism.

The general form was designed for the purpose of this research, and it included information about age, gender, education, job and marital

status, family structure, the existence of physical illness, some lasting psychological problems, the continuity of treatment, and questions about alcohol consumption and the war.

Ethical permission for the study was sought and provided by the Clinical Hospital Centre in Osijek. The research was conducted in an ethical and responsible manner, and is in full compliance with all relevant codes of experimentation and legislation.

Statistical methods

To describe the frequency distribution of the variables, descriptive statistical methods were used. All variables were tested to normality distribution with the Kolmogorov-Smirnov test. The middle values of continuous variables were expressed as an arithmetic mean/average and standard deviation for normally distributed variables, as well as the median and the range of variables which are not normally distributed. To determine the difference between two independent samples, the t-test was used, and for more than two samples, the ANOVA Kruskal Wallis test was used. To determine the difference between the proportions, the $\chi 2$ test was used. All P values were two-sided. The level of significance was set at $\alpha = 0.05$. For the statistical analysis, the statistical program SPSS (version 16.0, SPSS Inc., Chicago, IL, USA) was used.

Results

The average age of the patients examined was 41.67 years in 2004, and 51.16 in 2014. In 2004, was 63 patients, and 29 of them (46%) belonged to the 29-39 age group. In 2014, was 102 patients, and 54 (52.9%) were in the age group of 51 and over. All patients in 2004 were male. In 2014, 98 patients (96.1%) were male, and only 4 (3.9%) were female.

Most of the patients have completed high school education. Out of a total of 165 patients, 129 (78.2%) had high school education. In 2004, 17 (27%) patients were unemployed, 16 (25.4%) were employed, and 30 (47.6%) were retired. During 2014, 23 (22.5%) patients were unemployed, 16 (15.7%) were employed, and 63 (61.8%) were retired.

The marital status of the patients examined varied significantly over the years (χ^2 test; p = 0,007). The collected data are presented in Table 1.

Table 1. Marital status of patients

			Marital status					Total
			Married	Single	Divorced	Widow	Cohabitation	
Year	2004	Quantity	52	6	3	0	2	63
		%	82,5 %	9,5 %	4,8 %	0,0 %	3,2 %	100,0%
	2014	Quantity	59	15	23	3	2	102
		%	57,8 %	14,7 %	22,5 %	2,9 %	2,0 %	100,0%
Total		Quantity	111	21	26	3	4	165
		%	67,3 %	12,7 %	15,8 %	1,8 %	2,4 %	100,0%

The study shows that there is 14.5% of the patients without children, whereas 20.6% of the patients have one child. Patients with more than one child relate to the following numbers: 41.2% (two children), 17.3% (three children), 3.6 % (four

children), 1.2% (five children), and 1.2% (six children).

Most of the patients live with their wives and children: 34 (54%) of them from the 2004 study, and 40 (39.2%) of them from 2014 study. The number of the patients who live with their parents increased: only 2 (3.2%) patients lived with their parents in 2004, while in 2014, 14 (13.7%) lived with their parents. The number of patients who live alone also increased. During 2004, only 9 (14.3%) patients lived alone, while during 2014, 26 (25.5%) lived alone (χ^2 test; p = 0,032). Results have shown that 72.1% of the patients examined have family support.

The largest number of patients, 130 (78.8%), lived in their own houses or apartments. In 2004, 2 (3.2%) patients lived with their parents, while in 2014 the number increased to 16 (15.7%) (χ^2 test; p = 0,010). Also, in 2014, 16 patients lived with parents (15.7%). During 2004, 2 (3.2%) patients were tenants, while in 2014 there were 12 (11.8%) of them living as tenants.

During 2004, 33 (52.4%) patients lived in the city, whereas in 2014, 53 (52%) more patients lived in the countryside. Overall, out of 165 patients, 83 (50.3%) lived in the countryside.

If we look at the patients' answers to the question of age at the beginning of the war, the arithmetic mean approximated to 28.27 years; the minimum value was 16 years, while the maximum one was 55 years. If we look at the patients' period of involvement during the war, they participated actively for approximately 3.61 years. The minimum value of the war service was less than a year, while the maximum value was 6 years.

Out of 165 patients in 2004 and 2014, 124 (75.2%) have not suffered from injuries during the war. Also, 158 (95.8%) have not experienced the loss of a close person during the war.

Out of 165 patients, 132 (80%) had no problems with the law. Within the remaining 20% of the patients, the majority (14 of 33) consumed alcohol daily.

The data regarding the distribution of patients, considering their alcohol consumption, are presented in Table 2. The majority of the patients (159 = 96.4%) do not consume alcohol with drugs. During 2004, 5 (7.9%) patients consumed alcohol with the prescribed therapy, whereas in 2014, 20 (19.6%) patients consumed alcohol with the prescribed therapy. Results show that there are significantly more patients who don`t consume alcohol with the prescribed therapy (χ^2 test; p = 0,042).

Table 2. Distribution of respondents considering alcohol consumption

			Alcohol consumption				Total
			Every day	Several times a week	Several times a month	Do not consume alcohol	
Year	2004	Quantity	15	0	0	48	63
		%	23,8%	0,0%	0,0%	76,2%	100,0%
	2014	Quantity	43	3	7	49	102
		%	42,2%	2,9%	6,9%	48,0%	100,0%
Total		Quantity	58	3	7	97	165
		%	35,2%	1,8%	4,2%	58,8%	100,0%

None of the patients from the 2004 study were psychiatrically treated before the war. The 2014 study, however, shows that 3 (2.9%) patients were psychiatrically treated before the war.

In the 2004 study, 16 (25.4%) patients were shown to have had some medical problems (χ^2 test; p = 0,011), whereas the number increased to 46 (45.1%) in the 2014 study. During 2004, diabetes mellitus, epilepsy and hypertension were the most common medical problems. During 2014, 20 (43.3%) patients had hypertension, whereas 9 (19.6%) suffered from diabetes mellitus and gastritis. During 2004, 15 (23.8%) patients have been diagnosed with alcohol dependence co-occurring with PTSD, and in 2014 there were 43 (42.2%) patients. There were other co-morbidities which are presented in Table 3.

Table 3. Comorbidities

	Year	
Disorder	**2004**	**2014**
Acute stress reaction	0	4
Anxiety depressive disorder	3	3
Bipolar affective disorder	0	2
Depression	1	0
Depressive episode	3	2
Depressive disorder	9	0
Antisocial personality disorder	1	0
Emotionally unstable personality	0	2
Gambling	0	1
Crisis situation	1	6
Intentional self-harm	0	1
Chronic depressive disorder	1	1
Alcohol addiction	15	43
Delirium	1	0
The emotional unstable personality structure	1	0
Panic disorder	1	0
Persistent delusional disorder	0	2
Personality disorder	1	14
Adjustment disorder	1	3
Returning depressive disorder	4	32
Psychosis paranoides	0	1
Reactio psyhotica	0	2
Psychosis	4	0
Schizophrenia	1	0
Delusional disorder	1	0

Discussion

This research compared the medical documentation of the patients diagnosed with PTSD on the basis of the studies conducted in 2004 and 2014. Some of the results were expected. Almost half of the patients in 2004 were between 29 and 39 years, while in 2014, most of patients were over 51, from which we can conclude that the population is aging. The

majority of the patients examined were married. The reassuring fact is that they also have family support, which is very important for posttraumatic stress disorder. The results associated with this fact relate to the fact that more than half of the patients live with their spouses and children. During hospitalization, the inclusion is very important, particularly the inclusion of family in the therapeutic treatment. Families can ease the situation and motivate the patients to make progress. In all situations, nurses must support the patient's active role and prepare him/her for independent living (15).

A surprising result, however, is the increased number of divorced patients in 2014. There were 23 divorced patients compared to 2004 when there were only 3 divorced patients. In 2004, all 3 divorced patients had been diagnosed with alcoholism. In 2014 there were 23 divorced patients, 14 of which had been diagnosed with alcoholism. All divorced patients who have been diagnosed with alcoholism consumed alcohol daily. Such people are usually, but not necessarily, on their own, and it is harder for them to cope with the situation. Problematic drinking is one of the potential and negative health outcomes of the divorce (16). Marital dissolution can lead not only to increases in the quantity of the alcohol consumed (17), but also to increases in drinking-related problems (18). Possible explanations for this phenomenon involve mediation by divorce-related stress, decreases in family obligations, and changes in the social network and socializing behaviors (19). However, as with other mental health outcomes, individuals are likely to vary in the way the divorce affects their drinking behavior. It is obvious that alcoholism has a greater impact on marital status than PTSD.

In this study, most of the patients had no problems with the law, but the majority of those who do also suffer from alcohol dependence. This confirms the results of the previous studies which have shown that among the evaluated offenders, 57% was associated with addiction to alcohol and/or drugs, as opposed to 43% of the crimes associated with other mental disorders (20). The aim of one of the research was to analyze the impact of alcoholism in expressing and controlling aggression in war veterans with chronic PTSD. The studied sample included 240 war veterans with chronic PTSD. The results show that deprivation, aggression ($p < 0.001$) and opposition ($p < 0.05$) were more expressed in the respondents diagnosed with PTSD and alcoholism, as opposed to those whose PTSD diagnosis was not associated with alcoholism. In the patients who have been diagnosed both with PTSD and alcoholism, there is a statistically significant and predominant aggression apparent on all subscales, especially in comparison to subjects who have been diagnosed only with PTSD (21).

This study shows that more than one third of the patients diagnosed with PTSD suffer from alcohol dependence. These findings are related to the majority of negative results connoted with divorce, problems with law, etc. In 1999, there was research on co-morbidity of PTSD and alcohol dependence which concluded that 52.2% of the patients examined were taking medium and large amounts of alcohol during the war. PTSD is often associated with chronic alcoholism for the purpose of self-healing (22, 23). In general, men drink more often than women. However, habits, and the intensity of alcohol drinking differ throughout the world and are influenced by a number of factors, such as gender, age, and various social and economic factors. In Croatia, 81.3% of the male population and 51.2% of the female population drink frequently. Alcohol addiction is slightly more common in middle aged people who experience lower incomes and who are less educated. As for the level of education, alcoholism is more common in people with higher education, situated in an urban environment, whereas in rural areas alcoholism is predominantly associated with a lower education level (10). Taking all of the previously mentioned findings into consideration, the fact that this study has shown an increased number of alcohol-consuming patients with the prescribed therapy poses a serious issue. Such outcomes can have many negative effects on health, and in no way can contribute to improving mental health.

Conclusion

Based on the study and the results, we can conclude that most of the patients diagnosed with PTSD have family support. More than one third of the patients diagnosed with PTSD suffer from alcohol dependence. The number of people diagnosed with PTSD and alcohol dependence increased in 2014 when compared to the 2004 study, as well as the number of patients who consume alcohol with the prescribed therapy. The situation is the same with the number of the divorced patients in 2014 when compared to the 2004 study, and most of the divorced patients suffer from alcohol dependence. Whereas most of the patients have no trouble with the law, the majority of those who do also suffer from alcohol dependence have troubles with the law.

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Review

Theory of Unpleasant Symptoms and Concept of Nursing Support

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Abstract

Theory of unpleasant symptoms – TOUS – has been developing since the 1990s. TOUS is a theory in healthcare developed by healthcare workers and intended to be applied by them. According to this theory, multiple symptoms may occur simultaneously, interact with each other and be multiplicative. Several symptoms have been presented, including also psychological, physiological and cognitive aspects of a patient's personality. Symptom models described in the TOUS are the nociceptive model of dyspnea, symptom interpretation model, model of chronic dyspnea and symptom management model. TOUS is the first model to describe multiple, mutually related symptoms. By studying this theory, it can be concluded that controlling a single symptom is beneficial for controlling other symptoms. TOUS views a set of occurring symptoms without isolating any of the symptoms, but allowing for each symptom to be monitored separately. The theory helps in planning nursing interventions and facilitates healthcare delivery in general. The purpose of this theory is to help healthcare workers understand the symptoms and the methods used for their management. TOUS has been developed through clinical research; it establishes a logical connection between the symptoms and extends theoretical knowledge by taking into account previous factors, experiences of single or multiple symptoms and their impact on performance.

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Introduction

Nursing is a profession and an established scientific discipline that helps people achieve a healthy and productive life, or, rather, enables them to cope with particular deficiencies, poor health, illnesses and injuries the best way possible by using skill- based knowledge (1). The goal of nursing is not only to treat ill people, but to maintain good health, aid relaxation and provide relief and comfort. Every healthcare theory provides nurses with guidelines for providing healthcare and helping the patients. Theory of unpleasant symptoms (TOUS) was first mentioned in 1995 and revised in 1997. It advocates that particular symptoms frequently occur simultaneously and proposes monitoring of multiple symptoms. Application of the theory, combined with clinical observations and relevant literature, results in better understanding the patients experiencing those symptoms during their illness. To make the application of this theory as simple as possible in day-to-day work, it is necessary to study its core from the very beginnings, through its development, and up to contemporary experiences. This paper presents models of appearance of primary symptoms, such as pain and dyspnea, in chronically ill and oncological patients. Mental, physical and situational factors, as well as the sense of empathy, affect the development of such symptoms (2). The theory itself is aimed at investigating how to reduce the above-mentioned symptoms in order to achieve improvements in patients' quality of life (3).

Development and description of the theory

Theory of unpleasant symptoms (TOUS) started developing in the 1990s, when Audrey Gift and Linda Pugh, its authors, wrote a book on clinical healthcare titled "Dyspnea and Fatigue". Their work was first published in 1995, and revised in 1997 (3). TOUS is a theory in healthcare developed by healthcare workers and intended to be applied by them. According to this theory, multiple symptoms may occur simultaneously, interact with each other and be multiplicative. Group of symptoms affecting one another is called a symptom cluster (4). By controlling one symptom, we can control all the other symptoms. Appearance of symptoms is conditioned by physiological, psychological and environmental factors. The work of a nurse is based on monitoring symptoms for the purpose of diagnosing a disease as early as possible, but also to help patients reduce their health issues. To corroborate their theory, the authors used various scales while conducting their research and studying patients. Some of those were Visual Analogue Scale – VAS (5), Visual Analogue Scale Dyspnea – VASD (6), Numeric Rating Scale – NRS (7), McGill Pain Questionnaire (8), Brief Fatigue Inventory – BFI (9), Memorial Symptom Assessment Scale – MSAS (10) and Symptom Distress Scale – SDS (11).

Symptom models

Most symptom theories in medical literature mainly focus on the experience of symptoms, but not on their control. TOUS describes four symptom models.

Nociceptive model of dyspnea is determined by environmental factors corresponding individually to the severity of illness. It provides answers to healthcare delivery from a psychological perspective.

Symptom interpretation model requires knowledge, understanding and identification of symptoms. There are three main criteria in this model – input, interpretation and outcome. Input needs to have a strong influence in order to encourage thinking about something different. Interpretation relates to making a differentiation on the basis of experiential reasoning. Comparison between interpretations of symptoms is made by contrasting the most severe symptoms to typical symptom patterns, which is, at the same time, the only way they can be interpreted correctly. Outcome is the third and the most important aspect of this model, as it reveals how patients actually feel and what they are willing to accept to be able to receive help. Through interpretation, patients decide how they will control the symptoms they experience.

Model of chronic dyspnea is the first model for monitoring changes in behaviour. Its course is easier to follow using a longitudinal curve. Initially, it suddenly increases, then it returns to its initial state, and with time it rises again and reaches its peak. The model consists of physiological factors, dyspnea and, finally, its consequences. Chronic dyspnea is increased when influenced by episodes of acute dyspnea. Fatigue, depression, irritability, fear, reduced physical activity and social isolation appear as consequences.

Symptom management model is the most effective model for symptom control. Patients' experience of symptoms, symptom control and outcome of symptoms are interconnected. Symptoms are not controlled only by patients, but also by their families and healthcare workers. Quality of life, emotional and functional status and morbidity in use of healthcare services depend on the outcomes of symptom control. This model is important because it can assist doctors and nurses in helping patients control the symptoms they experience.

Theory analysis

Comprehensibility of the theory of unpleasant symptoms is observed through description of definitions and technical terms. Theorists have described techniques for overcoming unpleasant symptoms through clinical practice. All constituents of the theory, as well as key concepts, are described in a clear and understandable manner. Symptom models have been described starting from simple to complex ones. The relationship between clinical practice, research and theory is understandable. It is clear that all models argue for existence of multiple symptoms and suggest that controlling one symptom helps control the other ones. Use of key concepts both in explaining the theory and presenting the details of symptom models is also consistent. High level of consistency can be seen in the relationship between all the constituents, as all of them mutually support each other. The theory is applicable to all the patients experiencing the appearance of unpleasant symptoms. It was developed based on clinical practice and revised with the help of relevant literature. Interpretation of symptoms is monitored and symptoms can be observed separately or collectively. Numerous instruments are used for assessment of symptoms, such as the Numeric Rating Scale (NRS), McGill Pain Questionnaire (MPQ), and Brief Fatigue Inventory (BFI). There are also various scales for assessment of multiple symptoms, for instance the Memorial Symptom Assessment Scale and Symptom Distress Scale. TOUS was developed with help from healthcare workers and their observations. According to its criteria, it is consistent with the middle-range theory. It is used to examine the relations between patients' symptoms and their everyday cognitive functions. The theory can be used as an educational and a research tool in all areas and fields of healthcare.

Concept of nursing support

The term support has multiple meanings and may signify some kind of help, support and relief. It is commonly used in the healthcare system without a clear description of what is meant by it. Research of the term "support" in the context of nursing has resulted in a wide range of its definitions. Authors Ellis, Jackson and Stevenson state that dictionaries and related literature offer a wide range of meanings of the word, from "preventing a person to give up" to "encouraging statements" (12). By analysing those different meanings, we come to other related concepts such as help, safety, and empathy, which can be independently subjected to analysis of the concept, but in practice they are identical to the concept of support. Support/care that nurses provide to a patient is undoubtedly an important factor of healthcare, but providing support is in fact very complex, because patients and nurses may, considering different predisposing factors, perceive support differently. Some of those factors can be patients' age and/or education or particular organisational factors, such as the ratio between nurses and hospitalised patients (13). Providing support carries a different meaning for different people in different environments, but does not diminish its value. A

nurse may think she is providing support, while the patient may at the same time, due to his/her upbringing, assume that it is the nurse's duty to act in such manner only because she is required to do so. Both male and female nurses should not have a fixed attitude in their relationship with patients and assume that what they provide is support. They should rather adopt a flexible approach and try to clarify, define and eventually provide a particular kind of support. Built on an open and collaborative relationship, this kind of approach would ensure there are no ambiguities in its perception. Measuring support is extremely complex because it is limited to a feeling expressed by a patient. Any stay in hospital, regardless of the severity of symptoms, causes emotional difficulties, as well as anxiety and depression. Moreover, each patient must go through all the stages of adaptation to a disease (shock, denial, bargaining, depression, adaptation) (14). In their day-to-day work, nurses notice the aforementioned difficulties – phenomena and, aside from physical help, they often provide patients with psychological, spiritual and social support. Physical help can pertain to assistance with walking, while emotional support can refer to support provided when somebody is grieving. As already stated, the phenomena can be different, ranging from worry, fear and helplessness to physical limitations and cognitive impairments. When these phenomena are present, the patient also needs individual help from a nurse. Nurses meet patients' needs when they provide care using a holistic approach. In order for a nurse to cater to those needs in a satisfactory manner, it is necessary that both the nurse and the patient cooperate and negotiate on the type of help required by the patient. As a result, an important factor emerges in the process of providing healthcare, namely the need for specificity in determining a proper healthcare plan. As the actual purpose of nursing in this context is to create a common meaning for the term support, this is an extremely important factor for ensuring that healthcare is provided in a proper and satisfactory manner.

Connection between the theory of unpleasant symptoms and concepts of nursing support in practice

Male and female nurses are faced with increasingly complex requests to recognise and solve the patients' issues. That requires solid theoretical knowledge applicable in practice, a holistic approach, experience, skills, competence, and motivation. Application of practical clinical skills based on theory and relevant concepts is precisely what is unfailing in effectiveness. Understanding their relations based on scientific facts and research conducted by nurses will create the preconditions for emergence of theories and concepts in nursing practice applicable to day-to-day nursing tasks. The opinion held by the author of the book Nursing theories, J. B. George, is that concepts such as support produce nursing theories and that therefore, for some theories, a detailed description of a concept serves as the basis for its development (15). Theory of unpleasant symptoms and concept of nursing support have a very high level of applicability. Besides helping male and female nurses to use a comprehensive approach to symptom appearance and to plan nursing interventions, they also facilitate healthcare delivery in general. Authors tested their theory on patients suffering from a malignant disease, patients with chronic pulmonary disease and patients in the terminal phase of lung cancer. In accordance with our previous work, we saw that the theory and the concept can also be applied to cardiac patients. In this case, it was applied to a patient suffering from an acute myocardial infarction.

Case report: Patient N.N., aged 43, was admitted to the Coronary Unit of "Dr. Josip Benčević" General Hospital Slavonski Brod, diagnosed with an acute myocardial infarction. Upon admission he was pale, his skin was cold, he was sweating, he was scared and expressed concern for his condition. He was complaining about the pain in his chest that was spreading to his shoulders and back and was suffering from shortness of breath. Based on the above-mentioned, the following issues can be identified:

- Pain – reaction to one's physiological state. Presence of other unpleasant symptoms also depends on the intensity of pain.

- Shortness of breath (dyspnea) – increases as the pain increases.

- Fear/concern - affective reaction to current condition, "I am afraid I am going to die"

Nursing interventions were aimed at assessing the intensity and character of pain. On a scale from 0 to 10, the patient rated pain as 8 (VAS pain scale). Monitoring of vital functions, nasal catheter oxygenation and application of prescribed therapy were performed. During the nursing interventions, all the procedures were explained to the patient and nurses attempted to comfort him, i.e. to provide support. Through the application of the prescribed therapy and through decreasing the intensity of the pain, dyspnea also decreased and the patient was less scared. From all of the above, it can be concluded that the theory of unpleasant symptoms and the concept of nursing support were both applied in this case. By affecting a physical symptom (pain decrease) and providing psychological support, other unpleasant symptoms that were present also decreased.

Discussion

Nursing theories represent a tool for development of knowledge and are not designed as a recipe applicable in practice. They should be developed in accordance with nurses' creative thinking and their interaction with a patient (16). TOUS was created by taking the results obtained from practice and linking them to scientific literature. Many authors in the nursing science have developed models of patient care based on the existing nursing theories. By analysing the theory according to the criteria established by McKenna, it was noted that this theory is applicable both in practice and in further research. The advantage of the TOUS is that it helps nurses identify the objectives of nursing practice, which are, in this case, to decrease unpleasant symptoms and monitor the effect of one symptom on the other, and thus improve the quality of healthcare. Regarding the provision of nursing support of any kind, it is equally ambiguous as the term "providing care for" or "taking care of" a patient. Support measurement and assessment in a healthcare plan is a very complex issue. In healthcare, the term "support" is often used without a clear description of what is actually meant by it. What we conceptualise as nursing support is the product of a relationship between a nurse and an individual within a particular context. Different meanings arising from interpersonal communication exist simultaneously at different contextual levels. When it comes to providing support, the goal of nursing is to create a common meaning for the term "support", which requires mutual cooperation and a flexible approach. By accepting the ambiguity in the perception of the term "support" or "assistance", a nurse is able to cooperate with individuals and patients to create a common meaning for the word "support" in practice. In other words, together they can reach an understanding regarding what "support" actually means to that person. The concept of support as a method demonstrates the complexity of communication and different meanings that people may assign to it depending on the context and previous experiences.

Conclusion

The theory of unpleasant symptoms (TOUS) is a middle-range theory, i.e. a healthcare theory intended to be applied by healthcare workers. It includes specific concepts and connects them. Based on its interpretation, it can be concluded that unpleasant symptoms are interconnected and affected by various psychological, physical and situational factors. The work of a nurse is based on monitoring symptoms for the purpose of diagnosing a disease as early as possible, but also on helping patients reduce their health issues. This theory is acceptable because it helps in planning of nursing interventions and facilitates healthcare delivery in general. Knowledge and skills gained through education and research are important to successfully perform nursing practice, achieve compliance with nursing principles and fulfil any

expectations the community may have of male and female nurses, as well as the expectations they have of themselves based on their own professional ethics (17). An important aspect of the work of each nurse, as well as of healthcare in general, should be to provide patients with support, regardless of how complex that may be. TOUS and the concept of nursing support have a very high level of applicability. Based on personal experience at our workplace, we have come to know that this theory and concept are also applicable to patients suffering from diseases other than those investigated in this paper. Therefore, there is potential for their further development and research in nursing.

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Original article

Attitudes of Health Care Professionals About Importance of Health-Education Work of Public Health Nurses in Osijek-Baranja County

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Abstract

Aim: To examine the attitudes of health care professionals towards the importance of health-education work of public health nurses directed at individuals, families and communities.

Methods: 142 subjects participated in the research, of which 56 public health nurses, 44 primary care (family) physicians and 42 nurses working in family medicine teams. Research was conducted at the Health Centres in Beli Manastir, Osijek, Valpovo and Đakovo, Croatia. A segment of the standardized questionnaire Public Health Nursing Survey Instrument – a table of interventions conducted by public health nurses (California public health nursing investigation – Center for California Health Workforce Studies) – was used as the survey instrument.

Results: There were no significant differences in the attitudes of respondents by gender ($p = 0.898$) and age ($p = 0.067$) regarding the importance of public health nurses' health-education work. However, respondents aged 60 and over expressed more disagreement with some of the statements related to emotional components of their attitudes ($p = 0.019$). Regarding the length of work experience, there were no statistically significant differences ($p = 0.228$) on the overall scale of attitudes about health-education work of public health nurses. Regarding individual components on the scale, respondents with less work experience tended to agree more with the statements related to emotional components of their attitudes ($p = 0.004$). Regarding the level of education, there were no significant differences in the attitudes of respondents ($p = 0.156$) towards nurses' health-education work. Research also showed that there were no significant differences in attitudes about the importance of public health nurses' health-education work when it comes to the subjects' workplace ($p = 0.159$).

Conclusion: Health professionals have positive attitudes about health-education work of public health nurses directed at individuals, families and communities.

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Introduction

Health education is an indivisible part of health care, intertwined with human, cultural, social, health, emotional, ethical and psychological needs (1). It is defined as a health care measure for improvement and prevention of health and treatment and mitigation of consequences of diseases, which is achieved by adopting a healthy lifestyle and eliminating harmful health behaviours, as well as by providing education and spreading information on health care (2). National League of Nursing Education has developed a health education planning model called PRECEDE, which clearly defines the role of nurses in the process of health education (2). The model was created because neglecting the essential elements of public health work – preventive and educational tasks – was considered a weakness in the nurse education system. Nurses' health-education work demands cooperation on all levels of health care (primary, secondary, tertiary). Besides cooperating at all levels of health care, public health nurses also need to cooperate with other institutions – cities, counties, media, schools, nurseries - on matters related to nursing activities. In their work, public health nurses encounter many obstacles and unknowns when it comes to activities related to conducting health-education work. Cooperation in Croatia is still not established at a satisfactory level. In their research, Reckinger et al. evaluated 6 factors of competence: evaluation competencies, individual/family/community competencies, systems competencies, partnership/collaboration competencies, planning competencies and assessment competencies. Research was conducted on a sample of 2,269 public health nurses. The authors concluded that the abbreviated instrument could facilitate research on the relation between competencies, public health nursing interventions and public health nursing outcomes (3). In his paper, While demonstrated the importance of public health nurses' work through health education and its impact on the result of health care (4). Perception of public health nurses, in relation to their present role and future activities, was studied by Schoenfeld and MacDonald. Their results showed that public health nurses are focused mainly on working with individuals and families. In addition, they include community care and health promotion as one of the activities (5). Also, the study conducted by Grumbach, Miller, Mertz and Finocchio contains a survey of public health nurses regarding interventions targeted at individuals, families, communities and the entire system. Results indicate that the population health focus of public health nursing is not reflected in the practice activities, management priorities or educational preparation of public health nurses (6). In their study, Schaffer, Olson, Keller and Reckinger outline the activities of public health nurses that contribute to community health as one of the recognised factors of their work. Some of the important activities addressed in the research were emergency preparedness, health education of individuals and families, receiving and making of referrals, health promotion programs and case management (7). Based on a review of relevant literature, Thomas et al. conducted a study aimed at determining the effectiveness of interventions conducted by public health nurses. The conclusion was that current methods for a systematic review of quantitative literature can be successfully adapted for issues related to public health nursing and that systematic literature reviews are useful for policy development, program planning and development of future research questions (8). The main purpose of the present study is to examine health care professionals' attitudes about the importance of public health nurses' health education work targeted at individuals, families and communities by their level of education, age, gender, work experience and workplace.

Materials and Methods

A cross-sectional study involving 142 respondents was conducted. 56 public health nurses, 44 family physicians and 42 nurses working in family medicine teams participated in this survey. The research was conducted at the Health Centres in Beli Manastir, Osijek, Valpovo and Đakovo from May to June 2016. The original

survey questionnaire contained 32 questions. The research instrument used in the survey was a part of the "PHN Survey Instrument" – the table of interventions (California public health nursing investigation – Center for California Health Workforce Studies) (6) – which was modified for this research with prior permission for use. The questionnaire was adjusted for the purpose of conducting the research and specifying the work of public health nurses in Croatia, with the help from a professor from the Department of Nursing, Medical Ethics and Palliative Medicine of the Faculty of Medicine Osijek. The questionnaire was translated into Croatian by an independent language expert. The first part of the survey questionnaire contained demographic issues (age, gender, level of education, length of work experience and place of work). The second part of the survey contained a questionnaire consisting of 19 statements on health education which were rated by public health nurses. The statements were divided into three groups. The first group consisted of five statements related to the cognitive component of an attitude. The second group consisted of six statements related to emotional components of an attitude. The remaining eight statements were related to the statements constituting the behavioural component of attitudes (Table 1).

Table 1. Statements

STATEMENTS	**1**- completely disagree **2**- disagree **3**- neither agree nor disagree **4**- agree **5**- completely agree
1. Public health nurses contribute to the quality of health care by providing health education and information in cooperation with other experts at the local community level.	1 2 3 4 5
2. Public health nurses contribute to the preservation of health by implementing preventive measures through health education in cooperation with other community-based institutions.	1 2 3 4 5
3. Health education must be integrated into the daily activities of public health nurses.	1 2 3 4 5
4. Public health nurses carrying out health education activities succeed in preserving and improving health and preventing illness and injuries at the local community level.	1 2 3 4 5
5. Public health nurses establish and monitor health risks in the community, maintain and improve health, prevent diseases and injuries at the system level.	1 2 3 4 5
6. Public health nurses feel that they achieve something worthwhile through health education and awareness, cooperation and expert support at the system level (local or state).	1 2 3 4 5
7. Public health nurses believe that by cooperating and coordinating health and non-health services they solve or mitigate specific issues by implementing specific knowledge and skills.	1 2 3 4 5

8. Public health nurses feel useful when they participate in the implementation of health education measures for the improvement of the quality of health services at the system level.	1 2 3 4 5
9. Public health nurses try to implement preventive health measures targeted at individuals/families by providing health education.	1 2 3 4 5
10. Public health nurses are confident of the implementation of community-level preventive-health measures, including health education activities.	1 2 3 4 5
11. Public health nurses try to provide health education and awareness through the media whenever possible.	1 2 3 4 5
12. Public health nurses assess an individual's/family's health by coordinating the individual's health care and education to improve the quality of their life.	1 2 3 4 5
13. Public health nurses in their daily work advocate the interests of users/patients by educating them.	1 2 3 4 5
14. Public health nurses carry out planned interventions at homes for patients with chronic diseases and gives advice to chronic patients.	1 2 3 4 5
15. Public health nurses plan and carry out health consultations and educate families and/or individuals in specific cases.	1 2 3 4 5
16. Public health nurses implement health education measures aimed at individuals/families by identifying their problems/needs.	1 2 3 4 5
17. Public health nurses detect risk groups timely and implement community-based preventive-health measures.	1 2 3 4 5
18. Public health nurses provides information on which rights an individual/family can obtain at the local community level.	1 2 3 4 5
19. Public health nurses provide information about the rights and support that individuals/families can obtain at the system level for the purpose of ensuring full health care.	1 2 3 4 5

Statements were rated on the Likert scale from 1 (completely disagree) to 5 (completely agree). Reliability coefficient for the entire scale was calculated. Cronbach's alpha was 0.944. Prior to statistical data processing, the respondents were divided into 5 groups based on to their gender, level of education, work position, age and work experience.

Before the research was conducted, written consents of the Ethical Committees of the Health Centres Beli Manastir, Osijek, Valpovo and Đakovo were obtained. Approval to use the standard questionnaire "PHN Survey Instrument" was obtained from Kevin Grumbach from the UCSF Department of Family and Community Medicine of the SF General Hospital in San Francisco. All respondents were informed about

the purpose of the research. Prior to research, the respondents received a written statement and consent document for participating in the research. All respondents participated in the research voluntarily, which was confirmed by their signature. Filling out the questionnaire was anonymous. The research was conducted in accordance with ethical principles and human rights in research.

Statistical methods

Data in the categories was represented by absolute and relative frequencies. Numerical data was described by median and interquartile range boundaries because the variables did not follow normal distribution. The normality of the distribution of numeric variables was tested by the Shapiro-Wilk test. Differences in numeric variables were tested by the Kruskal-Wallis test based on the subjects' level of education and their workplace due to a deviation from the normal distribution. The correlation rating was given by the Spearman's coefficient of correlation rho (ρ). All P values were two-tailed. The level of significance was set to α = 0.05. The MedCalc statistical program (version 16.2.0, MedCalc Software bvba, Ostend, Belgium) was used for the statistical analysis.

Results

The study involved 13 (9.2%) men and 129 (90.8%) women. Regarding the level of education (completed secondary education, baccalaureate or university education), the fewest respondents had secondary education qualifications (N=42; 29.6%). Regarding work position (public health nurses, nurses in family medicine teams and family medicine physicians), the fewest respondents, 42 (29.6%) of them, were nurses working in family medicine teams. The respondents were divided into the 5 following age groups: up to 29 years of age, 30 – 39 years of age, 40 – 49 years, 50 – 59 years, and 60 years and over. Regarding the length of work experience, the respondents were divided into 4 groups: up to 14 years, 15 – 24 years, 25 – 34 years, and 35 years and more. The mean value of the respondents' age was 48 (interquartile range from 30 to 56, ranging from 24 to 65). As for the length of service, the mean value was 23 years (interquartile range from 5.5 to 33.5 years), ranging from 0.8 to 45 years. All respondents were from the Osijek-Baranja County.

Concerning cognitive components on the scale of attitudes in general, the largest number of respondents (N=102; 71.8%) agreed with the statement that health education must be integrated into the daily activities of public health nurses. 14 respondents (9.9%) neither agreed nor disagreed with the statement that public health nurses establish and monitor community health risks, maintain and improve health and prevent diseases and injuries at the system level. There were no significant differences in the rating of cognitive components on the scale of attitudes by gender (Mann-Whitney U Test, p = 0.052) or age group (Kruskal-Wallis test, p = 0.082).

Respondents aged between 30 and 39 gave lower ratings for the statement that public health nurses succeed in preserving health by implementing preventive measures through health education in cooperation with other community-based institutions. However, there were no significant differences in comparison with other age groups (Kruskal-Wallis test, p = 0.060). This is also true for the statement that public health nurses carrying out health education activities succeed in preserving and improving health and preventing illness and injuries at the local community level. However, there were no significant differences between different age groups (Kruskal-Wallis test, p = 0.216).

Respondents aged between 30 and 39 and between 50 and 59 gave a lower rating for the statement that public health nurses who determine and monitor health risks in their work maintain and improve health in the community or prevent diseases and injuries at the system level. However, there were no significant differences when compared to other age groups (Kruskal-Wallis test, p = 0.454) or with regard to work experience (Kruskal-Wallis test, p = 0.516).

The median value of cognitive components of attitudes with regard to the nurses' work position

was 4.8 (interquartile range 4.2 to 5). The value was lower for nurses working in a family medicine team (interquartile range = 4.6), but the difference was not significant in comparison with public health nurses (interquartile range = 5) or family medicine practitioners (interquartile range = 4.7). Likewise, subjects with a bachelor's degree gave higher ratings for cognitive components (interquartile range = 5), but the difference was not significant in comparison to the subjects with secondary education qualifications (interquartile range = 4.6) or university qualifications (interquartile range = 4.6).

As far as emotional components of attitudes are concerned, 132 (93%) subjects agreed with a statement that public health nurses try to implement preventive health measures directed at individuals/families by carrying out health education activities. Among these statements, the most substantial disagreement was expressed for the statement that public health nurses try to conduct health education and educate people through media whenever possible, with which 12 respondents (8.4%) disagreed.

Significantly lower rating for the statement that public health nurses are confident of implementing preventive health measures on the community level, including health education activities, was given by the subjects above 50 years of age (Kruskal-Wallis test, p = 0.004). However, there were no significant differences between age groups in relation to other statements. There were also no significant differences in the overall ratings on the scale of emotional components of attitudes by gender (Mann-Whitney U test, p = 0.723). Respondents with 35 or more years of work experience (Kruskal-Wallis test, p = 0.005), gave significantly lower ratings for said statement, as well as for the statement that public health nurses try to conduct health education activities and educate people through media whenever possible (Kruskal-Wallis Test, p = 0.041).

Nurses working in family medicine teams gave a significantly lower rating for the statement that public health nurses try to implement preventive health measures directed at individuals/families by providing health education when compared to the ratings given by public health nurses and family medicine practitioners (Kruskal-Wallis test, p = 0.029). Regarding other statements, there were no significant differences considering their work position (Kruskal-Wallis test, p = 0.395) or level of education (Kruskal-Wallis test, p = 0.492), taking into consideration the overall ratings on the scale of emotional components.

With regard to behavioural components, 89 respondents (62.7%) agreed with the statement that public health nurses carry out planned interventions at homes for patients with chronic diseases and give advice to chronic patients. On the other hand, eight respondents (5.7%) disagreed with the statement that public health nurses provide information about the rights and support that individuals/families can obtain at the system level for the purpose of ensuring full health care. There were no significant differences in the rating of behavioural components by gender (Mann-Whitney U Test, p = 0.666) and work experience (Kruskal-Wallis Test, p = 0.399).

With regard to age, the statement that public health nurses in their daily work advocate the interests of users/beneficiaries by educating them (Kruskal-Wallis Test, p = 0.024) received the highest rating from the respondents aged 40 to 49. On the other hand, respondents aged 50 and over gave significantly lower ratings for the statement that public health nurses detect risk groups timely and carry out community-based preventive health measures (Kruskal-Wallis Test, p = 0.012).

Regarding nurses working in family medicine teams, there was a significant disagreement with the statement that public health nurses in their daily work advocate the interests of the users/patients (Kruskal-Wallis Test, p = 0.001) and the statement that public health nurses implement health education measures aimed at individuals/families by identifying their problems/needs (Kruskal-Wallis test, p = 0.010).

When compared to family physicians and public health nurses, nurses working in a family

medicine team expressed a substantial disagreement with the following statements: public health nurses advocate the interests of users/patients by educating them (Kruskal-Wallis Test, p = 0.002); public health nurses carry out planned interventions at homes for patients with chronic diseases and give advice to chronic patients; (Kruskal-Wallis Test, p = 0.032); public health nurses plan and carry out health consultations and educate families and/or individuals in specific cases (Kruskal-Wallis Test, p = 0.031); and public health nurses implement health education measures targeted at individuals/families by identifying their problems/needs (Kruskal-Wallis Test, p = 0.030).

There were no significant differences in the overall ratings on the scale of attitudes regarding the importance of health-education work of public health nurses by gender, age, work experience, level of education or work position, as presented in Table 2.

Table 2. Overall scale of attitudes about the importance of public health nurses' health-education work based on gender, age, work experience, level of education and work position

Overall scale of attitudes about health-education work	Median (Interquartile range)	p*
Gender		
Male	4.5 (3.9 – 4.9)	0.898ǂ
Female	4.5 (4.1 – 4.9)	
Age groups		
up to 29	4.8 (4.1 – 5.0)	
30 – 39	4.5 (4.0 – 4.8)	
40 – 49	4.9 (4.3 – 5.0)	0.067
50 – 59	4.5 (3.9 – 4.8)	
60 or over	4.4 (3.9 – 4.7)	
Work experience		
up to 14	4.7 (4.1 – 5.0)	
15 – 24	4.5 (3.9 – 5.0)	0.228
25 – 34	4.5 (3.9 – 4.9)	
35 and more	4.4 (4.1 – 4.7)	
Level of education		
Secondary education qualifications	4.3 (3.9 – 4.8)	
Post-secondary qualifications	4.6 (4.2 – 4.9)	0.156
University qualifications	4.6 (4.0 – 5.0)	
Work position		
Nurse in a family medicine team	4.3 (3.8 – 4.8)	
Public health nurse	4.6 (4.2 – 4.9)	0.159
Primary care (family) physician	4.5 (3.9 – 5.0)	

*Kruskal-Wallis Test; ǂMann-Whitney U Test

Older respondents expressed more disagreement with the statements related to emotional (p = 0.019) and behavioural (p = 0.034) components of attitudes, as well as with the

scale in general (p = 0.035). Respondents with less work experience expressed agreement with emotional (p = 0.004) and behavioural components (p = 0.033) of attitudes to a larger degree, as well as with the scale in general (p = 0.020). This correlation is weak, but significant (Table 3).

Table 3: Assessment of correlation between the subscales and the scale of attitudes of the respondents towards public health nurses' health education-work based on age and work experience

	Spearman's Correlation Coefficient (p value)	
	Age	**Work experience**
Cognitive components	-0.078 (p = 0.357)	-0.081 (p = 0.342)
Emotional components	-0.198 (p = 0.019)	-0.243 (p = 0.004)
Behavioural components	-0.178 (p = 0.034)	-0.180 (p = 0.033)
Overall scale rating	-0.178 (p = 0.035)	-0.196 (p = 0.020)

Discussion

Demographic data in the study shows that the age of respondents ranged from 24 to 65 years and that the number of male respondents (13 or 9.2%) was, as expected, considerably lower than the number of female respondents (129 or 90.8). It is therefore difficult to make comparisons on the basis of the respondents' gender. Research has shown that the number of men in all segments of public health care is relatively smaller than the number of women working in this area (9). Though contrary to the research, this "trend" has recently been decreasing, even in public health nursing.

Respondents' age or length of work experience can be among the most important factors in the creation of their general attitude towards the importance of public health nurses' health-education work. The results of this study did not show significant statistical differences in attitudes, but one can notice that older respondents expressed more disagreement with the statements about health-education work of public health nurses, especially with the statements about emotional components of attitudes. On the other hand, the respondents with less work experience tended to agree more with the statements related to emotional components of attitudes, as well as with the statements on the overall importance of public health nurses' health-education work. Also, the results obtained in this research, considering the entire range of attitudes about the importance of public health nurses' health-education work, did not exhibit any significant differences in said attitudes with regard to the subjects' age and length of work experience. We assume these evaluations were based on an objective assessment of their own attitudes, but it is possible to question whether the older respondents observed these statements from the perspective of their own work experience and evaluated them on that basis.

An extremely large number of respondents agreed with the statement that health education must be integrated into the daily work of public health nurses. Likewise, looking at the overall set of attitudes, several respondents stated that public health nurses try to implement preventive health measures targeted at individuals/families by providing health

education. In contrast, nurses working in family medicine teams gave significantly lower ratings for that statement due to differences in their workplaces.

It should be emphasised that many respondents recognised the importance of integrating health-education work of public health nurses into their day-to-day activities. Also, in the majority of research pertaining to interventions, competencies and standards of public health nurses' practice, health education is regarded as one of the essential and major components of public health nurses' activities (6, 10).

Eight respondents disagreed with the statement that public health nurses provide information about the rights and support that individuals/families can obtain at the system level for the purpose of ensuring full health care. Also, respondents over the age of 50 and with 35 or more years of work experience gave considerably lower ratings for the statement that public health nurses are confident of the implementation of preventive-health measures targeted at the local community, including health education activities.

Research by Schaffer, Olson Keller and Reckinger and research by the Washington States Nurses Association showed that the public health nurses' activities at the local community level include coordinating health care for their beneficiaries, instructing patients and providing them with necessary information.

Also, health care activities of public health nurses are aimed at delivering health care to the entire population for the purpose of improving the quality of life, respecting individuals as equal subjects in the health care system, prioritising primary prevention and cooperating with other professionals and interest groups with a view to promote and protect human health (7, 11, 13).

Overall ratings on the scale of attitudes towards health care showed that 8.5% of respondents expressed disagreement with the statement related to health education and media literacy. It is important to note that a significantly lower rating was given by the respondents with work experience of 35 years and more.

Although public health nurses and other health care professionals should and indeed do take part in public health campaigns aimed at health preservation, some respondents did not recognise it.

Results of this survey showed that the majority of respondents agreed with the statement that public health nurses carrying out health education activities succeed in preserving and improving health and preventing diseases and injuries at the local community level. The majority of authors, such as Schoenfeld, MacDonald, Grumbach, Miller, Mertz, Finocchio, Schaffer, Olson Keller and Reckinger, state in their research that public health nurses carry out interventions targeted at individuals and that their health-education work is directed towards the entire community. This implies that it is required to assess the situation and plan health education activities with the aim of improving the health of a population in general (3, 5, 6, 7).

Results of this research showed that a small number of respondents disagreed with the statement that public health nurses detect risk groups timely and implement community-based preventive health measures. In their research, Schaffer et al. listed several negative impacts on the community health from the perspective of public health nurses, which impacts could arise if no preventive health measures were implemented (7). In their research, Schoenfeld and MacDonald regarded the implementation of community-based preventive health measures as one of the activities carried out by public health nurses (5).

Research results also show that nurses working in family medicine teams gave significantly lower ratings for the statements related to emotional components of attitudes about public health nurses' health-education work in comparison with public health nurses and doctors in family medicine. The same applies to the statement that public health nurses intend to implement preventive health measures targeted at individuals/families by providing health education.

In the research conducted by Keller et al., the most frequent interventions of public health

nurses are listed in five groups. These activities relate to screening, coordination of individual health cases, consulting, cooperation with other experts and health education, which can refer to both individuals and the community (12).

Regarding the behavioural component of attitudes about health education in terms of the respondents' workplace and level of education, nurses working in family medicine teams expressed more disagreement with the statement "Public health nurses in their daily work advocate the interests of users/patients by educating them." and "…implement health education measures aimed at individuals/families by identifying their problems/needs".

Interestingly, regarding the respondents' age, a considerably higher rating for the first statement, i.e. "Public health nurses assess an individual's/family's health by coordinating the individual's health care and education to improve the quality of their life", was given by the respondents aged 40-49. The question arises as to whether age and experience are related to "sensitivity" in terms of patient health care.

In the research they conducted, Schoenfeld and MacDonald state that the education and consultations for individuals and families provided by public health nurses are largely regarded as one of the most important components of their work. Likewise, the reduction, recognition, management and control of chronic diseases are regarded as some of the tasks of public health nurses (5).

The results of this study also show that nurses working in family medicine teams expressed more disagreement with the following statements related to the behavioural component of attitudes on the public health nurses' health-education work: "Public health nurses carry out planned interventions at homes for patients with chronic diseases and gives advice to chronic patients" and "Public health nurses plan and carry out health consultations and educate families and/or individuals in specific cases". The problem is that a large number of health professionals still assume that the only intervention performed by a public health nurse is blood pressure and blood sugar control; whereas all other interventions related to specific cases remain within the domain of in-home nursing care.

The results also show that nurses working in family medicine teams expressed more disagreement with the statement that public health nurses in their daily work advocate the interests of users/patients by educating them, identifying their problems/needs and implementing health education measures directed at individuals/families. In their research, authors Grumbach et al. stated that respondents focused mostly on activities targeted at individuals and families as those are some of the most important components of a public health nurse's work (6). In their research, which was focused on activities in the community, authors Olson Keller et al. state that public health nurse's tasks include the following: focus on the entire population, social representation, ethics, cultural diversity, holistic approach, prevention and health promotion and care for vulnerable groups of population (13).

Considering the overall ratings on the scale of attitudes, there were no significant differences in terms of the importance of the nurses' health education work regarding the respondents' level of education and workplace. However, significant number of nurses with secondary education qualifications gave lower ratings for their attitudes towards the importance of health-education work. In the research conducted by Zahner and Greding, the authors proposed raising awareness of the public, health care workers, social organisations and community members regarding the activities and the function of health-education work of public health nurses in order to keep such work visible and recognised, rather than "hidden" (14).

This research revealed that the importance health-education work of public health nurses is largely recognised. However, further research on this issue is important for raising awareness among health professionals regarding the primary and basic purpose of public health services as one of the most important constituents of the health care system. It is

necessary to include the primary, secondary and tertiary level, which will increase cooperation and coordination of delivering health care to individuals, families and the community, as well as improve the organisation of health care teams involved in such non-institutional care.

Also, more male respondents should be included in future research so that more gender-based comparisons could be drawn.

Conclusion

Public health nurses, nurses working in family medicine teams and family medicine doctors have positive attitudes towards the health-education work of public health nurses directed at individuals, families and the community. There are no differences in attitudes on the health-education work of public health nurses arising from differences in the respondents' level of education, age, gender, workplace or length of work experience.

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Review

A Proposed Pathway For The Treatment of Giant Cell Arteritis: Experience From a District General Hospital in The United Kingdom

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Abstract

Introduction: Giant Cell arteritis can be difficult to diagnose clinically. In those cases, where there is no certainty, there is more reliance on a temporal artery biopsy and radiological imaging to confirm the diagnosis. The purpose of this article was to identify the standard of care in individuals with suspected Giant Cell Arteritis in a typical district general hospital and to offer a proposed pathway for treatment.

Methods: Darent Valley Hospital has been managing Giant Cell Arteritis for many years but there has always been a need for an outlined pathway to identify those at risk of cranial complications like visual loss to improve patient care. We evaluated the management of 70 individuals that had a temporal artery biopsy and followed their treatment journey. We extracted clinical specialist, emergency admission, operation theatre and histological data. We collected clinic follow up data over the following years to identify those that relapsed on treatment, stayed in remission or had complications. We propose a pathway to manage those individuals with Giant Cell arteritis in line with the new advances in treatment.

Results: Ten patients were identified that had a histologically positive biopsy. Reassuringly, most individuals with an obvious clinical diagnosis had high dose glucocorticoid treatment commenced before even being referred for a biopsy. Nine individuals had visual ischemia out of which five lost their vision.

Conclusion: The presentation of a pathway will help streamline best medical and surgical practice and ensure the availability of urgent specialist treatment and to identify those at risk of ischemic complications.

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Introduction

Presentation of Giant Cell Arteritis

Temporal Arteritis (TA) is a spectrum of signs and symptoms involving the neck and cranial arteries due to a chronic inflammatory disorder. This can cause headaches, tender scalp, jaw claudication and more importantly visual loss. A complication of Giant Cell Arteritis (GCA), it is a chronic granulomatous inflammation of medium to large sized arteries, which can involve the aorta, proximal upper limb, neck, and extra cranial arteries. Irreversible blindness can occur if this arteritis involves the branches of the ophthalmic artery. It is called Arteritic Anterior Ischemic Optic Neuropathy (AAION) if it involves the posterior ciliary branches and and/or the ophthalmic artery. It is important that the patient have high dose glucocorticoids commenced immediately to prevent the progression of visual loss. Some individuals are at risk of losing their vision because of delay in commencing glucocorticoids (1).

Figure 1. Clinical presentation of the patient with temporal arteritis (authors' photograph)

Clinical presentation

Classically the patient will present to the clinic or to an emergency unit with headache and a tender scalp on palpation and would be unable to comb his/her hair. Signs will be palpation of a prominent, thick and tender artery with or without a palpable pulse. Fundoscopy might reveal papilledema on ophthalmological review. The erythrocyte sedimentation rate (ESR), C-reactive protein (CRP) and platelet count rise as an acute phase response.

Constitutional symptoms

Arterial lesions may be widespread and causes nonspecific symptoms like fever, malaise and night sweats. The fever can reach 38˚C but fever of unknown origin is more common in GCA.

Other features like malaise and weight loss may lead to the suspicion of malignancy leading to further investigations to rule out sinister causes.

Myalgia and muscle stiffness

The proximal muscles involving the shoulder and pelvic girdle are involved but distal muscles can also be involved. Muscle stiffness occurs commonly in the morning and can be debilitating and difficult to treat. Muscles can be tender causing difficulty in examining the strength and tone. Disuse leads to contractures and atrophy of muscles. The duration of symptoms can vary from weeks to months.

Joint symptoms

Patients can develop tenderness over joints especially over shoulder and hip joints. Synovitis although uncommon, can occur in the knees, shoulders and wrists.

Vasculitis involving branches of the external carotid artery

Headache and scalp pain are 50-75 % of the presenting symptoms of GCA. The headache is characteristically extra-cranial, boring and dull in nature. The occipital or posterior auricular branches can be involved leading to varied symptoms like difficulty in combing hair, pain behind the ear and inability to sleep using a pillow.

Jaw pain and claudication has been shown to be a common symptom in GCA and can occur in almost 50% of patients (2). The involvement of lingual and maxillary arteries leads to pain in the buccinators, maxillary muscles and tongue on

chewing and talking. There have been reports of tongue gangrene although uncommon but a serious effect of ischaemia due to disease in the lingual artery. There have been cases of scalp necrosis secondary to GCA. This is caused by severe arteritis and occlusion of the branches of the superficial temporal artery (3).

Vasculitis involving branches of the ophthalmic artery

In patients with GCA, decreased vision secondary to arteritis is the most serious consequence. It appears that 40% of patients presenting with visual loss have headaches, constitutional symptoms and Polymyalgia Rheumatica (PMR). Partial visual field loss can progress to permanent blindness eventually. If unilateral visual loss is not treated, the second eye can be involved and can go blind in 1-2 weeks (4).

Involvement of the central retinal artery is about 10%. Retinal signs and symptoms like exudates, haemorrhage and vasculitis are seen. Amaurosis fugax occurs in 10% of patients with GCA. Eighty percent of patients with amaurosis develop blindness and hence treating the patients urgently is of fundamental importance. Branches of the ophthalmic artery also supply the muscles to the eye and can cause diplopia and ptosis (5).

Vasculitis of larger arteries

The symptoms may be due to the involvement of the aortic arch and descending aorta. The incidence varies from 9-18%. Thoracic aneurysms with the presence of giant cells in the arterial wall can occur after a decade of the successful treatment of GCA. It typically presents in a younger age group and mostly in women.

The majority of symptoms involve arm or lower limb claudication. Subclavian steal syndrome can occur due to narrowing of aortic arch roots. Aortic aneurysms and intestinal infarction can occur but renal vessel involvement is rare. GCA and Takayasu's disease have overlapping signs, radiological findings and symptoms (6).

Polymyalgia Rheumatica

PMR syndrome can occur alone or in conjunction with Giant Cell Arteritis. Forty percent of patients with GCA have PMR. Characteristically it starts with aching in the shoulder and hip girdles and morning stiffness. Muscle weakness and elevated muscle enzymes unrelated to PMR. The individual experiences intense fatigue and malaise. There is a raised Erythrocyte Sedimentation Rate (ESR) and C-reactive protein. It is a clinical diagnosis and is treated with low dose GC in contrast to GCA where high dose GC is given. PMR can present with distal synovitis that can mimic rheumatoid arthritis.

Patients with PMR should be warned to report new headaches or visual symptoms that could be the hallmarks of incipient GCA immediately (7).

Complications secondary to GCA

Cranial

1. There can be a long interval between the onset of symptoms and the occurrence of blindness. Temporal arteritis may not be apparent initially if the symptoms are subtle. Most commonly acute anterior ischemic optic neuropathy develops (8, 9, 10).

2. Vertigo, deafness and tinnitus.

3. The central or peripheral nervous system can be involved leading to strokes and transient ischemic attacks (9).

4. The extent of the involvement of the scalp vessels depriving one area of the scalp of an adequate blood supply can cause scalp necrosis. There have been studies describing scalp necrosis secondary to ischaemia. In some case reports there have been occasions where debridement and skin graft was required for the area of skin loss (3, 11).

Extracranial

1. Intermittent claudication and rest pain of upper and lower extremities due to

inflammation in more axial large vessels can lead to persistent symptoms despite GC treatment. This requires appropriate investigations like magnetic resonance imaging and colour Doppler imaging. If symptoms persist, Takayasu's aortitis needs to be ruled out as it can remain subclinical and quiescent despite being on GC therapy (12, 13).

2. Aortitis and aortic dissection needs to be high in the differentials if presenting with atypical symptoms, backache and renal failure due to dissection extending down to the renal vessels.

3. Cardiac murmurs like aortic regurgitation can lead to heart failure.

4. Individuals can present with constitutional and PMR like symptoms, fever of unknown origin and raised inflammatory markers with no obvious clinical evidence of any aortic branch involvement.

Incidence and epidemiology

Over a 50-year period in Olmsted County, Minnesota, there were 173 incident cases of GCA during the 50-year study. Of these, 79% were women. A cyclic pattern of annual incidence rates was apparent, with evidence of 6 peak periods the mean age at diagnosis was 74.8 years (14). There has been increasing interest in epidemiology of GCA where it was found to be more common in certain families particularly in the Scandinavian Countries (15).

Investigations and Diagnosis

Traditionally clinical suspicion from the usual unilateral throbbing headaches and a tender scalp lead to an ESR test and an immediate prescription of high dose oral steroids as soon as possible. Clinical suspicion is important with typical throbbing headaches, tenderness in the scalp and age over 50.

TAB (temporal artery biopsy) is still performed quite frequently for individuals with clinical findings of GCA. TAB has traditionally been the gold standard for a diagnosis (2, 16).

In 1990 The American College of Rheumatology after comparing 214 GCA individuals and 593 patients with other forms of vasculitis, identified criteria to diagnose GCA. For the traditional format classification, five criteria are:

1. age greater than or equal to 50 years at disease onset,

2. new headache localised to the temple,

3. temporal artery tenderness or decreased temporal artery pulse,

4. elevated erythrocyte sedimentation rate (Westergren) greater than or equal to 50 mm/hour,

5. Biopsy sample including an artery showing necrotizing arteritis (17).

Pathophysiology

It is known that the inflammatory cascade activates early in the pathological process of GCA. However, the initiating event (aetiology) remains uncertain. There are many suspected pathogens. Endothelial injury leads to the cell mediated immunity to be stimulated leading to the activation of the antigen presenting cells to the endothelium. This triggers vascular dendritic cells and monocytes to produce interleukin-6 (IL-6), IL-1 and pentraxin 3 (18). This leads to the stimulation of the liver to produce C- reactive protein (CRP). Constitutional symptoms as if fever and myalgia develop that are very responsive to glucocorticoid therapy, which effectively inhibits production of cells stimulated by Th17, which produces IL-6.

The arterial wall is infiltrated by Th1 and Th17 type 4p lymphocytes. Th1 lymphocytes produce interferon-g (IFN-g) and which result in formation of multinucleated giant cells from interaction with macrophages. Glucocorticoids have minimal effect on these cells showing why visual loss persists despite high dose applied (19). GC therapy can suppress mechanisms affected by the IL-6 like Th17 activity. The increasing number of circulating immune cells and the inability of dendritic cells to block access to the arterial wall via the PD-1 immune checkpoint suppress the natural defences. It is

known that the NOTCH 1 receptor on T cells and NOTCH-jagged 1 Ligand receptor on the vasa-vasorum in the endothelium allow permeability of T cells into the vessel wall (20).

Platelet derived growth factor (PDGF) is an important cytokine activating concentric intimal hyperplasia. PDGF comes from macrophages and giant cells differentiating it from other vasculopathies. The media of the vessel wall is the main site of injury. The medial macrophages secrete tissue destroying enzymes and cytokines like PDGF and vascular endothelial growth factor (VGEF) that also initiate repair. This results in a hyperplastic intima leading to occlusion of the vessel lumen. The intima and media is the centre of the pathological process. Cell adhesion molecules and endothelial cells play a pivotal role in the repair process and neovascularisation. Cell adhesion molecules might regulate how leukocytes and endothelial cells interact differently in different temporal arteries (21). Activated white cells and platelets cause vessel inflammation and vascular thrombo-embolic events, an important finding in diagnosing GCA.

The inflammatory changes are quite similar to polymyalgia rheumatica. However, PMR is more of a systemic disease. The symptoms are more constitutional like fever malaise and weight loss. More specifically, there is more proximal muscle pain and joint pain in the shoulder, neck and pelvis. There is considerable chance (50%) in patients of TA to have PMR.

Temporal Artery Biopsy Procedure

The individual is consented for the biopsy and then brought in to the operating theatre. Ideally, Duplex ultrasound helps in identifying the temporal artery. We infiltrate local anaesthetic under the skin. A sterile field is created using drapes. A transverse or longitudinal incision is made on the skin just over the artery. Both ends of the artery are ligated with absorbable or non-absorbable suture and a generous length is isolated. The artery is divided between the two ligatures. The skin is apposed after haemostasis with interrupted non-absorbable or continuous absorbable suture. A sterile dressing is applied to the wound. Non-absorbable sutures on the face or temple are removed in 5 days in the community.

There has been a suggestion that the intra-operative assessment can identify thickness, tortuosity, colour/pallor of the arterial wall, blood flow, and the lumen size. This gives enough evidence to confirm the macroscopic presence of TA and appropriate treatment can be commenced immediately. However, it depends on the experience of the surgeon. This was studied in 111 cases where the intra-operative findings were compared with the histological findings and showed a 100% negative predictive value for biopsy negative specimens (22).

Complications secondary to temporal artery biopsy are not common. There have been reports of skin necrosis after temporal artery biopsy due possibly to arteritis changes in smaller collateral arteries. Facial nerve injury can occur due to inadvertently not picking a safe zone and injuring the main branches of the facial nerve. Clinically this leads to weakness of muscles of facial expression and frontalis muscle weakness. Four cases of facial nerve injury were identified in one study. This can result in a permanent eyebrow droop on one side. It has been advocated that biopsy be orientated at the more parietal than frontal region to avoid injury to the frontal branch of the facial nerve (23, 24, 25).

Histological assessment of the specimen

The specimen is sent to the laboratory in a sterile pot with formalin. The dimensions of the specimen are measured especially the length. The specimen is bisected or trisected (3 mm each length) and then 'embedded'. The specimen is dehydrated, cleared, and infiltrated with the embedding material. They are ready for external embedding. The tissue sample is placed into moulds along with liquid embedding material (such as agar, gelatine, or wax) which is then hardened. Longer specimens need to have more sections taken. Three levels each from the individual trisected specimen are examined after staining with Haematoxylin and Eosin.

Haematoxylin stains the nuclei blue and Eosin stains the cytoplasm, red blood cells and collagen fibres. The remaining part of specimen is stained with Elastic Van Giessen (EVG) staining. This stain is useful in demonstrating atrophy of elastic tissue. Specific immuno-histochemical stains are carried out in some institutes but the typical findings of giant cells and inflammatory cells (as below) help in earlier diagnosis (26).

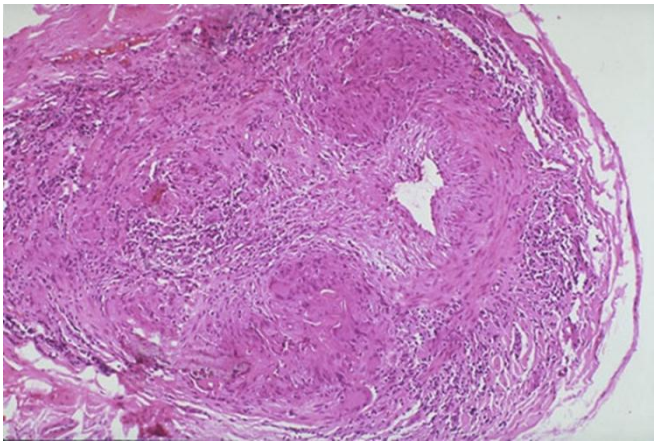

Figure 2. Focal granulomatous inflammation and sometimes giant cells are visible. Courtesy library.med.utah.edu

Patients and Methods

Study Design

This is a retrospective case series study of individuals that underwent temporal artery biopsy in a district general hospital Darent Valley Hospital in Kent. There is great interest in the sequence of events that eventually lead to a TAB. Here are reviewed the events and outcomes of individuals that had a temporal artery biopsy. To achieve an adequate number of cases, the audit covered a number of years from 2009 to the current year.

Case Retrieval

All data of individuals undergoing a temporal artery biopsy were retrieved from our theatre link of operation records on our intranet called 'Theatreman'. Case notes identified by first identifying specific codes for 'temporal artery biopsy' from the Information Technology department and then were compared with operating theatre data and histological data. The case-notes were electronic through our Electronic Health Records (EHR).

Biopsy results were extracted from the Darent Valley Hospital online Histopathology system. Seventy-six patients had a temporal artery biopsy from 2009 to 2018. All biopsies carried out were direct referrals form the emergency department and clinics. We documented all correspondence from the general practitioner and specialists. Each individual was evaluated using the American College of Rheumatology (ACR) criteria. The American College of Rheumatology criteria were used to diagnose GCA. Scoring criteria included age, headache, scalp tenderness, ESR and TAB results. The biopsy confirmed the diagnosis despite many individuals scoring three or four based on clinical suspicion and ESR. The biopsy criteria were the presence of inflammation and microscopic presence of chronic inflammatory cells in the muscle. There also is disruption of the internal elastic lamina with or without the presence of giant cells (27, 28).

The history of glucocorticoids administration was assessed throughout the period of the individual's illness. Operation notes identified the date of the procedure and grade of surgeon. The time elapsed from surgical referral to biopsy were recorded in days. This data was then transferred on to an excel sheet held on a computer.

Data Collection

A standard audit questionnaire helped in retrieving data. A single surgeon collected all the data from the case notes and later transferred all the data on to a Microsoft excel spreadsheet. The basic epidemiological data collected was age at biopsy, gender and mode of referral.

Presenting symptoms were unilateral or bilateral headache, visual symptoms and jaw claudication. Signs recorded were ESR, ophthalmologic examination signs and scalp tenderness. Positive findings on scalp examination were tenderness by palpating the

artery, thickening and pulsation/no pulsation. We observed the duration in days from the surgical referral to biopsy and the date of commencement of corticosteroids. We recorded age above 50 years and ESR above 50 mm/sec as positive criteria according to the ACR. The histology results documented were for all TABs whether positive or negative and the specimen length of the temporal artery. The grade of the operating surgeon was either a surgical consultant or registrar. We gave particular attention to the visual signs /symptoms like amaurosis fugax or blindness, the findings of fundoscopy and the ophthalmologist opinion.

We documented the start date of steroid therapy and previous administration of steroids. The change in dose of steroids was not possible to evaluate throughout the patient's history.

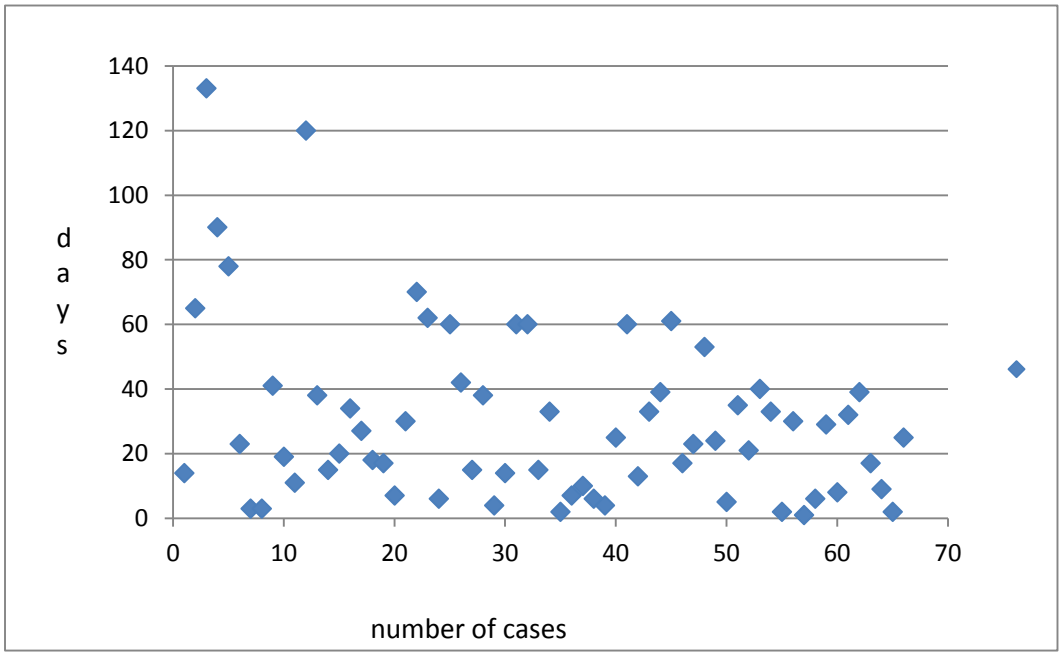

Figure 3. Length of delay from diagnosis to biopsy date

Results

There were 76 individuals in the series. Only 10 temporal artery biopsy results were positive on histology for temporal arteritis. Six patient's notes were not retrievable. The presenting signs and symptoms were as per Table 1.

Table 1. The presenting signs and symptoms of the patients with temporal arteritis

Age > 50 years	*64/70*
ESR > 50mm	*19/70*
Temporal tenderness	*49/70*
Temporal headaches	*58/70*
Jaw claudication	*12*
ACR scores	
ACR score 1	*6*
ACR score 2	*16*
ACR score 3	*32*
ACR score 4	*11*
ACR score 5	*2*
Time till surgery	
1 week	*17*
2 weeks	*8*
>2 weeks	*55*
Biopsy length	
1 cm or above	*30*
<1cm	*36*
No artery/inadequate sample	*4*
Biopsy findings	
Positive biopsy	*10*
Negative biopsy	*60 (6 inadequate specimens, vein, too small)*

Description of patients

The mean age was 67.9. The youngest age to have a TAB was only 38 and oldest was 87 years old. There were 48 women out of 70 cases (68% of the total).

The mean Erythrocyte Sedimentation Rate (ESR) calculated was 34.9 from 66 documented individuals that had an ESR done. The minimum ESR documented was zero and maximum was 110. There were four patients with no record of an ESR.

Headaches were the most common symptoms as observed in our study. The pain is typically sudden and localised to one side of the scalp. However, it can occur in the parietal, occipital and frontal regions as well. The headache is new and different from any other type of headaches. Twelve patients never had headaches out of the 70 but still had a biopsy done. Nine individuals with headaches had bilateral involvement.

Forty-nine of the 70 individuals had a tender scalp on examination as an emergency or in clinic review. Some cases had documentation of thickness or non-pulsatile artery.

Nine individuals had pain in the muscles of mastication while eating and chewing characteristic of jaw claudication.

The visual findings were amaurosis fugax, complete or partial visual loss or diplopia. Five patients had complete visual loss. We recorded

visual acuity testing and finding characteristic signs of Acute Anterior Ischemic Occlusive Optic Neuritis (AAION). Four other patients had visual impairment with characteristic findings of AAION but managed to receive GC therapy urgently to avoid loss of vision. Six individuals had vague symptoms like blurring of vision and diplopia. It is important to note that two individuals that had characteristic AAION did not have histologically positive biopsies.

Discussion

The management of GCA begins with the clinical diagnosis. A biopsy is occasionally required when there is no clear clinical diagnosis based on the ACR criteria. The treatment revolves around the immediate treatment, prolonging remission and the prevention of relapse. The aim of immediate treatment is to control the immediate systemic inflammatory response and to avoid complications like acute visual loss. There have been extensive studies on the optimal treatment modalities for the last 20 years. Glucocorticoid treatment remains the mainstay acute treatment for GCA despite the risk of adverse events.

The immediate side effects of steroids include glucocorticoid effects such as hyperglycaemia especially in patients with diabetes mellitus and mineralocorticoid effects such as fluid retention. Other side effects include mania, psychosis and depression, osteoporosis, Cushing's disease, obesity, new onset diabetes mellitus, peptic ulcers and depression on reduction or cessation of steroids. Less common effects are hepatic steatosis, avascular necrosis and weight gain. Prolonged administration of prednisolone may lead to adrenal suppression. Eventually, this may cause the body to temporarily lose the ability to manufacture natural corticosteroids especially cortisol, which results in dependence on prednisone. Prednisone is tapered if taken for more than seven days.

Individuals with PMR are commonly on low dose prednisolone for chronic systemic symptoms. Clinicians should be aware of the likelihood of needing higher doses of steroids to combat the effects of GCA. Meticulous evaluation based on the clinical signs and symptoms is compulsory to avoid injudicious use of high dose steroids in high-risk individuals.

Even in this era of evolving clinical practice where more and more individuals are performing duplex ultrasonography to confirm or rule out a clinical diagnosis of TA, a biopsy still carries importance. In our trust there is growing enthusiasm in performing DUL in clinic on individuals with a suspicion of GCA (29).

Previous studies have showed that between a quarter and one third of all patients having TAB yield a positive temporal artery biopsy. In our case series, the results showed that 12% of biopsy specimens came back positive (30). Of these positive biopsies, eight cases out of 10 were an ACR score of three and above and probably did not need a biopsy. If we look at the clinical criteria, most patients had an ACR score of 3-4 fulfilling the diagnosis of temporal arteritis on the first clinical encounter and at the most could have benefitted with DUL without the need for a biopsy. We can safely treat patients based on clinical presentation and laboratory ESR findings. This will avoid unnecessary use of steroids on individuals with low clinical suspicion of GCA.

We know that a biopsy will have a higher chance of being positive in the first two weeks than later. Twenty-five biopsies were performed within 2 weeks in our series. Narvaez et al in his study evaluated the effects of duration of steroid treatment on biopsy results. The highest positive results were achieved (78%) in the individuals that had a biopsy within 2 weeks of commencing steroids. It obviously suggests that there is a lesser chance of getting a positive biopsy result in patients having a biopsy after 4 weeks of steroid therapy (31).

There is considerable debate on the length of specimen needed to confirm GCA. GCA is a chronic granulomatous inflammation with skip lesions interspersed with normal artery sections. There was a general statement in all biopsy negative results: 'as GCA is a patchy disease, we

cannot exclude arteritis due to the existence of skip lesions in GCA.' Skip lesions were seen in 8.5% of specimens with active vasculitis in a previous study (32). The biopsy specimen is divided into 3-4 segments and each visualised under the microscope individually. Various studies have shown that the median specimen lengths for positive biopsies were ranging between 5mm and 12 mm but the established benchmark has been 1 cm and above (33). In another study a length of 20 mm or longer had a 2.8 times more likelihood of having GCA compared to those less than 20 mm in length (34). In our series, 30 specimens were at least 1cm long prior to fixation. Forty specimens were shorter than 1cm or were not adequate samples.

There is a degree of contraction of the biopsy specimen before fixation with formalin. It can extend to 12% of contraction for GCA positive specimens and 22% for GCA negative specimens. The length of the specimen is calculated by measuring the in-vivo with the ex-vivo size before fixing. If this is true then a specimen of 10mm would contract by more than 2mm if negative for GCA (35).

Complicated cranial GCA carries a high risk of visual loss and cerebrovascular accidents. The provision for ophthalmological review and imaging of the head needs to be readily available. In evolving visual changes, the recommendation is to administer intravenous GC for the first 2-3 days in hospital and then change to oral treatment to prevent the catastrophe of visual loss (26, 36).

High dose GC treatment must continue until the individual's inflammatory phase is well controlled. Tapering regimes of GC therapy are proposed in the British, European and French consensus guidelines (26, 37, 38).

Numerous studies on various biological and non-biological agents show prolonged remission and reduction of recurrent relapses. Methotrexate has been shown to reduce the dose of GC required in patients with recurrent disease and in those which cannot take high dose GCs (7, 39). Recently Tocilizumab has been recommended in relapsing GCA in the British National Institute of Clinical Excellence guidelines (40).

Table 2. Proposed pathway for the management of Temporal Arteritis (Cont)

Diagnosis:

Clinical

- Age >50
- Abrupt onset headache (usually unilateral in the temporal area)
- Scalp pain or difficulty in combing hair
- Visual symptoms (blurring loss/diplopia)
- Jaw/tongue claudication
- Systemic symptoms of fever, weight loss, loss of
- appetite, depression and tiredness
- Symptoms of polymyalgia rheumatica
- Limb claudication

Poor Prognostic Symptoms:

- Features predictive of ischaemic neuro-ophthalmic complications
- Jaw claudication
- Visual symptoms (amaurosis fugax, and diplopia).

Examination:

- Abnormal superficial temporal artery: may be tender, thickened with reduced/absent pulsation
- Scalp tenderness
- Transient or permanent visual loss (partial or complete) in 20% patients
- Visual field defect

- Relative afferent papillary defect on swinging flashlight test
  - Anterior ischaemic optic neuritis (Pale, swollen optic disc with haemorrhages)
- Central retinal artery occlusion
  - Upper cranial nerve palsies.
  - Features of large vessel GCA: Asymmetry of pulses and blood pressure and bruits (usually of the upper limb)

Duplex Ultrasound(DUL)

- clinic review with characteristic 'halo' sign

Laboratory Investigations:

- Markers of a raised inflammatory response
- ESR and CRP, anaemia, thrombocytosis, raised alkaline phosphatase, raised α1 and α2 globulins.
- However, Temporal arteritis can occur in the face of normal inflammatory markers, if the clinical picture is typical

TAB

- confirmation of clinical diagnosis

MRI/FDG PET/CT

- suspected proximal disease

Differential Diagnosis:

- Herpes zoster, migraine, cluster headache, acute angle glaucoma, TMJ pain, cervical spondylosis, malignancy

Management of GCA:

- Acute

Complicated GCA (cranial symptoms and signs)

- Visual ischemia

Hospital admission with Intravenous high dose GC 3 days

High dose oral GC

- Visual loss

Oral 60 mg prednisolone to protect contralateral eye

- Uncomplicated GCA

Prednisolone 60mg

Tapering dose of GC

Low dose GC +/- Methotrexate/tocilizumab for recurrent relapse or GC tapering

Steroid Withdrawal:

- Consider steroid reduction only in the absence of clinical symptoms, signs and lab abnormalities suggestive of active disease.
- This should be balanced against the need to use the lowest effective dose, patient wishes and steroid side effects.
- Suggested tapering regimen:

40-60mgs prednisolone continued until symptoms and laboratory abnormalities resolve (at least 3 to 4 weeks)

Then dose reduction by 10mg every 2 weeks to 20mg,

Then by 2.5mg every 2-4 weeks to 10 mg,

Then by 1mg every 1-2 months provided there is no relapse.

Table 3. Proposed pathway for the management of Temporal Arteritis (Cont)

After Care:

- Rheumatology specialist review
- Screening for cardio-vascular disease, hypertension and hyperlipidaemia
- Bone protection and proton pump inhibition if indicated.
- Systemic symptoms, limb claudication or persistently high-inflammatory markers despite adequate glucocorticosteroid therapy. →PET and MRI
- TA Patients screening for abdominal aortic aneurysms (repeat every 2 years whenever indicated).

Monitoring of Therapy:

- Clinical assessment + inflammatory markers
  (Evidence of relapse, disease-related complications and glucocorticosteroid-related complications)
- Jaw and tongue claudication.
- Visual symptoms.
- Vascular claudication of limbs, bruits and asymmetrical pulses.
- Polymyalgia symptoms.
- Osteoporotic risk factors and fractures.
- Perform the following investigations:
  At each visit: full blood count, ESR/CRP, urea and electrolytes, glucose.
  Every 2 years: chest radiograph to monitor for aortic aneurysm (echocardiography, PET and MRI may also be appropriate).
  Bone mineral density may be required.

Management of Relapse:

- Return of symptoms of GCA, ischaemic complications, unexplained fever or polymyalgia symptoms.
- Return of headache → higher dose of glucocorticosteroids.
- Jaw claudication requires 60 mg prednisolone.
- Eye symptoms need the use of either 60 mg prednisolone or IV methylprednisolone.
- Assessment of large vessel involvement.

For recurrent relapse:

- Early introduction of methortrexate or alternative immunosuppressant
- In recurrent relapse or failure to wean glucocorticosteroid dose. These immunosuppressive agents should be started at the third relapse.
- Tocilizumab has been approved for Temporal Arteritis

Ophthalmological considerations

- Aspirin, Ophthalmology review for ischemic symptoms/signs
- Bone protection / PPI → Omeprazole, Alendronic Acid,
- Calcium and vitamin D

Conclusion

Temporal artery biopsy is useful for the diagnosis of cranial GCA. The various imaging modalities especially duplex ultrasonography are an important adjunct to the clinical diagnosis. The treatment should not be delayed if there is good clinical suspicion or with risk of visual loss.

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Original article

Work-related Stress and Most Common Stressors for Surgical Nurses

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Abstract

Aim: The objective of this research was to determine the stress level in nurses at the Department of Surgery, Clinical Hospital Osijek, and to identify the most common stressors.

Methods: The research included 105 nurses, 29 (28%) were men and 76 (72%) of them were women. It was conducted anonymously, by standardized questionnaire Occupational Stress Questionnaire for Hospital Health Care Workers.

Results: The total scale of stress was 3.2 (interquartile range from 2.6 to 3.7) with no significant differences by gender. The results showed no statistically significant differences in the level of stress in terms of age, total length of service and level of education. The most common stressors in surgical nurses are insufficient number of employees, work overload, administrative work, a 24-hour responsibility, inappropriate public criticism, fear of infection, conflict with superiors, night and overtime work and pressure of set deadlines.

Conclusion: The greatest stress in surgical nurses, was connected with the work organization and financial issues, and in a group of women, a large share of stress was connected with the public criticism and litigation.

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Introduction

Stress at work has been recognised worldwide as the greatest challenge for workers' health and for their organisations (1). McGrath (1973) defines stress as a significant imbalance between the demands and the ability to meet them, in a situation where a failure to satisfy the requirements has, according to the workers' estimations, significant consequences (2). Stress at work is a specific type of stress originating in the work environment. Medical profession is classified as a high-stress profession due to a high level of responsibility for human lives and health, exposure to specific stressors, such as chemical, biological and physical hazards, and shift work (3). Unlike the majority of other people, nurses face real suffering, pain and death on a daily basis. Nursing is, by its nature, an extremely stressful profession (4). Members of surgical teams are exposed to common stressors, such as overtime work, shift work and extremely demanding requirements (5). At the same time, good leadership, close cooperation and teamwork, as the essential qualities of the members of a surgical team, can impose additional work-related requirements, consequently accumulating more work-related stress (6). Work in the operating room is one of the most exciting and demanding activities performed by the nurse, but it is also one of the most stressful health care jobs. Teamwork is the key element of working in the operating room and it has been increasingly recognised that acute stress has a harmful effect on teamwork and communication between team members (7). Operating nurses should have a high level of psychophysical stability and use constructive stress-response strategies, as those are considered the essential qualities of nurses working in the operating room (8). Development of medicine and technology has increased the scope of work performed by nurses working in the operating room. As efficiency and promptness are the most important requirements and the staff is constantly under stress, the OR department should therefore increase the amount and quality of stress relief courses (8).

Nurses working in intensive care units are exposed to a higher level of stress than those working in other departments (9). A research conducted in intensive care units in Brazil examined the presence of work-related stress and dissatisfaction with activities that are considered critical for intensive care units. Symptoms related to cardiovascular, digestive and musculoskeletal disorder, present in nurses working in intensive care units, are closely connected with the characteristics of particular health areas, which causes dissatisfaction and stress symptoms (10). Burnout syndrome is a state of mental, physical or mental and physical exhaustion caused by excessive and prolonged stress (11). A study among nurses has shown that higher levels of burnout caused by work-related stress are associated with lower job satisfaction (12). Surgical nurses have indicated different factors of job satisfaction (13) and stress (9) in comparison with other nurses and they also expressed higher motivation (14).

The objective of the study is to determine (I) the stress level and (II) the most common stressors for nurses at the Department for Surgery of the Clinical Hospital Osijek and (III) to determine the differences in the impact of stress among nurses in relation to their gender, age, education and length of service.

Subjects and Methods

A cross-sectional survey among health care workers, operating nurses employed at the Department of Surgery in the intensive care units and operating rooms at the Clinical Hospital Osijek was conducted in May and June 2015. Research included 105 participants, of which 29 (28%) were men and 76 (72%) were women. The majority of participants, 79 (76.7%) of them, had secondary education qualifications. The mean age of participants was 38 years (the interquartile range of 30-48 years) and the mean

length of service was 16.5 years (the interquartile range of 8-26 years), with no significant differences by gender. The participants were informed about the research in written and oral form. Before the survey was conducted, the participants had read the instructions as an introduction to the main objective of the research. In the instructions, it was also emphasised that participation in the research was anonymous and voluntary. Afterwards, the respondents gave their written consent for participation in the study. It took fifteen to twenty minutes for the participants to complete the questionnaires. Completed questionnaires were submitted to the examiner personally in an envelope in order to ensure anonymity of the research. The Ethics Committee of the Clinical Hospital Osijek gave its consent to conduct the research.

The standardised Occupational Stress Questionnaire for Hospital Health Care Workers developed by Milan Milošević (2009), which consists of 37 workplace stressors, was used in this research (15). Based on a preliminary research, it was estimated that some issues (fear of exposure to cytostatics, constant responsibilities during 24-hour shifts and time limits for patient examination) were not particularly relevant for the study because the participants do not work with cytostatics, do not work in 24-hour shifts and do not perform patient examinations.

The first part of the questionnaire included 34 workplace stressors classified under six factors. The stressors were related to work organisation and financial issues, public criticism and litigation, occupational risks and hazards, conflicts and poor communication, shift work and professional requirements. The participants estimated the stressors on the Likert scale by rating them from 1 to 5, where 1 was (not stressful at all), 2 (rarely stressful), 3 (occasionally stressful), 4 (stressful) and 5 (extremely stressful). The second part of the questionnaire consisted of general data relating to socio-demographic characteristics (gender, age, education and total length of service).

Statistical methods

Figures were described by a median and interquartile range. Categorical variables were described in absolute and relative frequencies. Fisher's exact test and the Mann-Whitney test were used to examine the differences between independent groups (by age, gender and education). The level of significance was set at $\alpha = 0.05$. Data analysis was done by the SPSS software system for Windows (version 13.0).

Results

The study included 105 participants, of which 76 (72%) were women. Table 1 presents the comprehensive data about the participants' age, length of service and education qualifications categorised by gender (Table 1).

Table 1. Participants by characteristics and gender

	Men	Women	Total	p
Total	29 (28%)	76 (72%)	105 (100%)	
Age*	40 (28–49.5)	38 (31.5–47)	38 (30–48)	0.985†
Length of service*	19 (7.5–28)	16 (8.5–25)	16.5 (8–26)	0.894†
Qualifications				
secondary school qualifications	24 (82.8%)	55 (74.3%)	79 (76.7%)	
college qualifications	4 (13.8%)	15 (20.3%)	19 (18.4%)	0.770‡
university qualifications	1 (3.4%)	4 (5.4%)	5 (4.9%)	
Age groups				
up to 30 years	10 (34.5)	16 (21.1)	26 (24.8)	
31 – 40	6 (20.7)	27 (35.5)	33 (31.4)	0.348‡
41 – 50	8 (20.7)	23 (30.3)	31 (29.5)	
51 and over	5 (17.2)	10 (13.2)	15 (14.3)	
Length of service - groups				
up to 10 years	11 (37.9)	20 (26.3)	31 (29.5)	
11 – 20	5 (17.2)	26 (34.2)	31 (29.5)	0.286‡
21 – 30	8 (27.6)	22 (28.9)	30 (28.6)	
31 and over	5 (17.2)	8 (10.5)	13 (12.4)	

* Median (interquartile range); † Mann-Whitney test; ‡ χ 2 test

The majority of participants stated that stress related to work organisation and financial issues is caused mostly by an insufficient number of workers (49 participants, i.e. 46.7%) and work overload (40 participants, i.e. 38.8%). Besides that, 23 participants (21.9%) rated public criticism as extremely stressful (Table 2).

Table 2. Participants by level of stress related to work organisation and financial issues and to the public criticism and litigation

	Number (%) of participants					
	Not stressful at all	Rarely stressful	Occasionally stressful	Stressful	Extremely stressful	Total
WORK ORGANISATION AND FINANCIAL ISSUES						
Inadequate income	3(2.9)	14(13.5)	29(27.9)	39(37.5)	19(18.3)	105(100)
Inadequate financial resources	2(1.9)	10(9.5)	30(28.6)	46(43.8)	17(16.2)	105(100)
Inadequate workspace	5(4.8)	25(23.8)	33(31.4)	32(30.5)	10(9.5)	104(100)
Little opportunity for promotion	9(8.7)	22(21.2)	42(40.4)	18(17.3)	13(12.5)	105(100)
Poor communication with superiors	8(7.6)	33(31.4)	33(31.4)	18(17.1)	13(12.4)	105(100)
Insufficient number of workers	3(2.9)	7(6.7)	17(16.2)	29(27.6)	49(46.7)	105(100)
Poor work organisation	8(7.7)	21(20.2)	25(24)	27(26)	23(22.1)	103(100)
Unexpected situations on a daily basis	4(3.8)	12(11.4)	35(33.3)	34(32.4)	20(19)	103(100)
Administrative work	5(4.8)	3(2.9)	29(27.6)	29(27.6)	39(37.1)	105(100)
Work overload	4(3.9)	5(4.9)	12(11.7)	42(40.8)	40(38.8)	105(100)
PUBLIC CRITICISM AND LITIGATION						
Threat of lawsuits	12(11.4)	16(15.2)	27(25.7)	29(27.6)	21(20)	105(100)
Inadequate expectations of patients	7(6.7)	13(12.4)	40(38.1)	29(27.6)	16(15.2)	105(100)
Inappropriate public criticism	4(3.8)	16(15.2)	29(27.6)	33(31.4)	23(21.9)	104(100)
Misinforming patients	5(4.8)	19(18.1)	47(44.8)	22(21)	12(11.4)	105(100)
Conflicts with patients	6(5.7)	27(25.7)	34(32.4)	25(23.8)	13(12.4)	105(100)
Non-separation of professional from private life	15(14.4)	20(19.2)	45(43.3)	16(15.4)	8(7.7)	105(100)
24-hour shifts	11(10.6)	13(12.5)	18(17.3)	37(35.6)	25(24)	103(100)

Conflict with superiors was rated as an extremely stressful event by 21 participants (20%). An equal number of the participants rated night work as either extremely stressful (24.8%) or not stressful at all (20%) (Table 3). Considering professional requirements, the pressure arising from imposed time limits represented the most significant stressor for 20 participants (19%), whereas 15 participants (14.3%) rated the introduction of new technology as not stressful at all (Table 3).

Table 3. Participants by level of stress related to occupational risks and hazards, to conflict and poor communication and to shift work and professional requirements

	Number (%) of participants					
	Not stressful at all	Rarely stressful	Occasionally stressful	Stressful	Extremely stressful	Total
OCCUPATIONAL RISKS AND HAZARDS						
Fear of ionizing radiation	17(16.2)	35(33.3)	22(21)	22(21)	9(8.6)	105(100)
Fear of inhalation anaesthetics	29(28.2)	33(32)	24(23.3)	10(9.7)	7(6.8)	105(100)
Fear of infection	13(12.4)	29(27.6)	24(22.9)	28(26.7)	11(10.5)	104(100)
Fear of injury with a sharp object	13(12.5)	32(30.8)	25(24)	19(18.3)	15(14.4)	105(100)
Facing incurable patients	7(6.7)	17(16.2)	37(35.2)	26(24.8)	18(17.1)	105(100)
CONFLICTS AND POOR COMMUNICATION						
Conflicts with colleagues	9(8.6)	23(21.9)	35(33.3)	25(23.8)	13(12.4)	105(100)
Conflicts with other associates	10(9.5)	21(20)	41(39)	22(21)	11(10.5)	105(100)
Poor communication with colleagues	14(13.3)	20(19)	39(37.1)	22(21)	10(9.5)	104(100)
Conflicts with superiors	15(14.3)	20(19)	26(24.8)	23(21.9)	21(20)	105(100)
SHIFT WORK						
Night work	21(20)	18(17.1)	18(17.1)	22(21)	26(24.8)	105(100)
Shift work	14(13.5)	26(25)	22(21.2)	24(23.1)	18(17.3)	105(100)
Overtime	16(15.2)	20(19)	21(20)	24(22.9)	24(22.9)	104(100)
PROFESSIONAL REQUIREMENTS						
Introduction of new technologies	15(14.3)	22(21)	40(38.1)	12(11.4)	16(15.2)	105(100)
Overload of information from profession	11(10.5)	21(20)	45(42.9)	12(11.4)	16(15.2)	105(100)
Lack of appropriate permanent education	13(12.4)	20(19)	44(41.9)	19(18.1)	9(8.6)	104(100)
Unavailability of literature	12(11.4)	25(23.8)	46(43.8)	10(9.5)	12(11.4)	105(100)
Pressure of imposed time limits	6(5.7)	18(17.1)	25(23.8)	36(34.3)	20(19)	105(100)

Total rating on the scale of stress was 3.2 (interquartile range from 2.6 to 3.7) and there were no significant differences by gender. The most significant stressors were related mostly to work organisation and financial issues, whereas female respondents stated that a considerable amount of stress arises from public criticism and litigation (Mann-Whitney test, $p = 0.046$) (Table 4).

Table 4. Average rating on stress scale by gender

	Median (25% - 75%) by gender			p*
	Men	Women	Total	
Work organisation and financial issues	3.5 (2.8-3.8)	3.5 (3.1-4)	3.5 (3.1-4)	0.137
Public criticism and litigation	2.9 (2.4-3.7)	3.4 (2.8-3.9)	3.4 (2.6-3.9)	0.046
Occupational risks and hazards	2.4 (1.8-3.7)	2.9 (2.3-3.6)	2.8 (2-3.6)	0.352
Conflicts and poor communication	3 (2.3-3.8)	3 (2-4)	3 (2-3.8)	0.829
Shift work	3 (2-4)	3 (2-4)	3 (2-4)	0.738
Professional requirements	3 (2.3-3.4)	3 (2.4-3.6)	3 (2.4-3.6)	0.291
Total rating	**3 (2.5 - 3.6)**	**3.3 (2.7-3.8)**	**3.2 (2.6-3.7)**	**0.167**

* Mann-Whitney Test

Occupational risks and hazards were the sources of stress for participants aged between 31 and 40. Although some variations were observed, they were not particularly significant (Table 5).

Table 5: Average rating on stress scale by age

	Median (25% - 75%) by age groups					p*
	up to 30 years	31 – 40	41 - 50	51 and over	Total	
Work organisation and financial issues	3.3 (3-3.7)	3.6 (3.1-3.9)	3.5 (3.1-4)	3.9 (3.5-4.2)	3.5 (3.1-4)	0.111
Public criticism and litigation	2.9 (2.6-3.4)	3.6 (2.6-4.1)	3.4 (2.4-3.7)	3.7 (3-4.3)	3.4 (2.6-3.9)	0.069
Occupational risks and hazards	2.7 (2.2-3.5)	3 (2.1-3.7)	2.8 (1.8-3.5)	2.6 (2-4)	2.8 (2-3.6)	0.988
Conflicts and poor communication	2.9 (2-3.5)	3 (2.1-4)	3 (2-3.8)	3.3 (2.3-4.3)	3 (2-3.8)	0.368
Shift work	2.8 (2-3.8)	3 (2.3-4.2)	3.3 (1.7-4)	3.7 (2.3-4.3)	3 (2-4)	0.451
Professional requirements	3 (2.4-3.3)	3 (2.3-3.5)	3.2 (2.2-3.8)	3.4 (2.8-3.8)	3 (2.4-3.6)	0.368
Total rating	**3 (2.5-3.4)**	**3.2 (2.8-3.8)**	**3.3 (2.5-3.8)**	**3.5 (2.8-3.8)**	**3.2 (2.6-3.7)**	**0.264**

* Mann-Whitney Test

According to the participants with secondary education qualifications, the greatest source of stress lies in work organisation and financial issues. There were no statistically significant differences based on the level of education (Table 6).

Table 6. Average rating on stress scale by level of education

	Median (25% - 75%) by level of education				p*
	secondary	college	university	Total	
Work organisation and financial issues	3.5 (3-3.9)	4 (3.2-4.5)	3.2 (3.1-4.4)	3.5 (3.1-4)	0.051
Public criticism and litigation	3.4 (2.6-3.8)	3.4 (2.7-4.1)	2.7 (1.9-4.1)	3.4 (2.6-3.9)	0.607
Occupational risks and hazards	2.8 (2.2-3.6)	2.6 (1.4-3.6)	2.6 (1.6- 4.1)	2.8 (2-3.6)	0.800
Conflicts and poor communication	3 (2.3-3.8)	3.3 (2-4)	2.5 (1.9-4.4)	3 (2-3.8)	0.974
Shift work	3 (2-4)	2.3 (1.7-4.3)	4 (3.3-4.5)	3 (2-4)	0.240
Professional requirements	3 (2.4-3.6)	3 (2.2-3.6)	3.2 (2.7-4.4)	3 (2.4-3.6)	0.626
Total rating	**3.2 (2.7-3.6)**	**3.1 (2.5-4.1)**	**3 (2.5-4.2)**	**3.2 (2.6-3.7)**	**0.963**

* Mann-Whitney Test

Participants with the shortest length of service (up to 10 years), rated work organisation and financial issues as the most significant sources of stress were, whereas occupational risks and hazards were rated as the least significant sources of stress by the participants with 30 or more years of service (Table 7).

Table 7. Average rating on stress scale by length of service

	Median (25% - 75%) by the length of service					p*
	up to 10 years	11 - 20	21 – 30	30 years and over	Total	
Work organisation and financial issues	3.5 (3-3.6)	3.6 (3.1-4)	3.6 (3.2-4)	3.9 (3.5 - 4.1)	3.5 (3.1-4)	0.144
Public criticism and litigation	2.9 (2.6-3.6)	3.3 (2.7-4)	3.5 (2.7-3.8)	3.7 (2.9 - 4.1)	3.4 (2.6-3.9)	0.229
Occupational risks and hazards	2.8 (2.2-3.4)	2.8 (1.8- 3.6)	2.7 (2-3.9)	2.8 (2.1 - 3.7)	2.8 (2-3.6)	0.997
Conflicts and poor communication	2.8 (2-3.5)	3 (2.5-4)	3 (2-4)	3.3 (2.6 - 4.1)	3 (2-3.8)	0.258
Shift work	2.7 (2-4)	3 (2-4)	3.7 (1.6-4.3)	3.3 (2.5 - 4.2)	3 (2-4)	0.634
Professional requirements	3 (2.4-3.2)	3 (2.4-3.6)	3.3 (2.4-3.9)	3 (2.6 - 3.7)	3 (2.4-3.6)	0.275
Total rating	**3 (2.5-3.5)**	**3.2 (2.7-3.7)**	**3.4 (2.5-3.9)**	**3.5 (3 - 3.8)**	**3.2 (2.6-3.7)**	**0.316**

* Mann-Whitney Test

Discussion

The results of our research indicate that the participants working in operating rooms and intensive care units are exposed to a wide range of work stressors. Golubić et al. (2009) identified the six following major groups of occupational stressors among Croatian nurses: organisation of work and financial issues, public criticism, occupational hazards, interpersonal conflicts at workplace, shift work and professional and intellectual demands (16). Due to a lack of staff, nurses who take care of patients come under more pressure. As a result, such pressure causes concern and stress for nurses, whereas the lack of staff causes an excess of administrative tasks and overtime work, usually not paid by the State (17). Despite the lack of staff, the job has to be done, which leads to fatigue and exhaustion, thus further increasing the level of stress and keeping nurses in an ever-expanding vicious cycle. It has been found that temporary contract nurses suffer from higher stress levels than permanent contract nurses (9). All around the world, nurses have recognised a small number of workers as one of their greatest problems (18). In the countries in transition, there has been an increase in the number of nurses leaving the nursing profession (19). Work organisation and financial issues are significantly more stressful for nurses in comparison to any of the other factors mentioned in the research (20). The most common causes of stress for Chinese nurses are the imbalance between investment and gain, poor image of nursing in society and organisational issues (21).

When it comes to public criticism and litigation, the main stressors are constant responsibilities during 24-hour shifts, inappropriate public criticism and the threat of litigation. Women are exposed to significantly higher levels of stress, above all because of public criticism and litigation. It has been suggested that such higher stress levels result from multiple and complex roles that women have to perform – the role of an employee, wife, mother and housekeeper (22). Also, in a research conducted among Croatian nurses, Knežević (2009) pointed out that the stressors related to public criticism are the most common stressors for nurses working in non-surgical professions, followed by those working in surgical professions (23).

Regarding occupational risks and hazards, the most significant stressors are coping with incurable patients, fear of infection and fear of injury from sharp objects. These are the main sources of stress for nurses and the situation has not changed even after thirty years (24). In a research conducted among Croatian nurses, Golubić et al. (2009) concluded that nurses with secondary education qualifications perceived occupational hazards as statistically significantly more stressful than nurses a with college degree, as well as that offering educational and career prospects can contribute to decreasing nurses' occupational stress levels (16).

Conflict between nurses and health care staff includes the power of superiors, the ability to work in a team, interpersonal relations and skills and expectations at different levels (25). A study on nurses conducted in Iran presented the factors that have an impact on conflicts (the nature of work, working conditions, work environment, hospital structure, management style and individual characteristics of employees) and that can improve or worsen the situation. The majority of nurses pointed out that they suffer from psychological stress due to misunderstandings between nurses and other staff (26). It is believed that good communication skills are required to create an effective relationship, which is why a lack of such skills can have a negative effect on nurses and their colleagues at work (27).

Certain personality traits can also affect occupational stress. "Screening" before employment, used for identification and presentation of one's "personality" and stress perception, can be considered a part of a particular employment strategy aimed at resolving the issues related to stress, illness and absence from work (28).

The most common factors causing burnout are as follows: work overload, lack of control, insufficient rewards, poor labour relations, injustice and conflict between values (29). A research in Belgium from 2015 showed that besides the softer work characteristics – such as

decision latitude, social capital and team cohesion – more insight and knowledge of the hard work characteristic workload is essential (30). Education, training and career opportunities can reduce occupational stress experienced by nurses and at the same time contribute to maintaining their working capacity (31). Overtime, shift and night work, responsibility in decision-making, contact with patients and their families and emotional exhaustion (burnout) of health care workers contribute to increased morbidity from mental disorders and psychosomatic diseases (32). In surgery, cognitive symptoms of stress include problems in concentration and memory, resulting in a risk for a patient's safety (33). A study conducted in China has also indicated that a lack of nurses, excessive paperwork, increased number of operations, imposed time limits and night shifts are factors associated with stress that have a negative impact on patient care (34). Serious problems and difficulties in patient care may cause crises in nurses' work and lead to various stressors, such as criticism at work, crisis between superiors and subordinates and job dissatisfaction. All of the above leads to symptoms related to cardiovascular, digestive and musculoskeletal changes as sources of stress (10).

Overall, the greatest sources of stress for the participants in the study are work organisation and financial issues, with shift work as the most significant stressor for nurses with college education qualifications. Occupational risks and hazards are the sources of stress for respondents aged 31-40. Although some variations were observed, they were not statistically significant. A study of causes of stress among nurses in Iran showed that work-related factors were more relevant in causing occupational stress than demographic and other factors (35). However, a study conducted in Serbia yielded opposite results (36). Besides that, much research conducted among nurses has also shown show that there is a connection between particular diseases and work-related stress, such as emotional exhaustion (37), physical exhaustion (32) and lower back pain (38).

Conclusion

In the summary of the results of this research, we conclude that total rating on the stress scale was 3.2 (interquartile range from 2.6 to 3.7). The most common stressors among surgical nurses are insufficient number of employees, work overload, administrative work, constant responsibilities during 24-hour shifts, inappropriate public criticism, fear of infection, conflicts with superiors, night and overtime work and pressure of imposed time limits. Results showed no statistically significant differences in the level of stress with regard to the participants' age, total length of service and level of education. Regarding female respondents, a considerable amount of stress arises from public criticism and litigation.

Better work organisation, supportive work environment, continuous education and stress management programs are essential for critical care and operating room nurses. Based on the above-mentioned facts, it is clear that further research on this matter must be conducted.

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