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THE GRIT OF NURSES/TECHNICIANS DURING THE COVID-19 PANDEMIC

SUMMARY: The COVID-19 pandemic brought many new challenges to whole society, and especially to health systems, including nurses who had to find the strength and perseverance to overcome all obstacles and challenges. The aim of this study was to investigate the level of perseverance among nurses during the COVID-19 pandemic and to determine the influence of age, gender, level of education and work experience on their perseverance. The study includeed 109 respondents (88.1% females), in the Special Hospital for Medical Rehabilitation Krapinske Toplice during February 2021. The validated GRIT questionnaire was used as a research instrument, which contains 12 statements to which respondents responded on a Likert scale from 1 to 5. The data was analyzed by descriptive and analytical statistics, and presented at the significance level of $P<0.05$. Analyzing the collected data, the mean value of perseverance was 3.59±0.49. There was no difference in perseverance between participants in terms of age, gender, ward they work in, and their work experience. A statistically significant difference was found regarding the level of education. The highest level of perseverance was found among nurses with a specialist degree (4.22) or a university graduate professional studies degree (3.97), and the lowest level of perseverance among those with completed undergraduate professional nursing studies (3.51; P=0.042). The results point to a difference in the level of perseverance of nurses depending on the level of education, but not on the workplace. The research on the perseverance of nurses is important for the further development of the nursing profession.

Key words: pandemic, COVID-19, nurses/technicians, perseverance, GRIT

INTRODUCTION

Modern nursing is faced with numerous challenges every day; from the development of computerization, progress of medicine, and the global pandemic to the shortage of nurses, while the need for healthcare is getting bigger and more complex.

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The World Health Organization (WHO) declared 2020 the year of nurses and midwives with the aim of unifying and improving health care on a global level. Since the year 2020 was marked by the COVID-19 pandemic, for which the world was not prepared, a great burden and responsibility was borne specifically by health professionals, who were on the front line of defense. In those challenging times, the exceptional strength and sacrifice of nurses came to the fore. Nurses took care of their patients and put their patients' needs before their own, whether it was their personal or professional needs, and regardless of fear and the threat it imposed to their own health and the health of their loved ones. This showed their pro-

fessionalism, perseverance, and commitment *(ICN, 2021)*.

The COVID-19 pandemic put a heavy burden on healthcare systems around the world, and especially on the nursing sector, which, being directly exposed to the global spread of the virus, faced the biggest challenges in that profession. Despite the lack of human resources and equipment, as well as the lack of psychological counseling and support to preserve mental health, the nursing profession has shown that it is still capable of providing the best healthcare and fighting dangerous infectious diseases like COVID-19 *(Buheji, Buhaid, 2020)*.

During the pandemic, nurses had to quickly adopt the skills of using new technologies and adapt to the faster flow of information. Despite the difficult working conditions, the use of new equipment and procedures, and the dangers they were exposed to, perseverance (GRIT) has shown itself to be one of the key qualities that represents the essence of the nursing profession. According to the basic definition developed by psychologist Angela Duckworth, "GRIT" or perseverance is passion and focus on achieving long-term and important goals, that is, the ability to persist in something even when obstacles appear *(Duckworth, Gross, 2014)*.

Perseverance is a necessary trait in the nursing profession. Nurses who stand out possess the qualities of excellence, determination, and compassion in their work, and are often described as having the fortitude and strength to overcome the obstacles and challenges that are part of their everyday life *(McCabe, 2016)*.

Research conducted among medical professionals during the COVID-19 pandemic has shown that healthcare professionals have increased resilience despite facing increased levels of stress during the pandemic. Higher levels of resilience and perseverance were protective factors in managing personal and systemic stressors at the height of the COVID-19 pandemic *(Huffman et al., 2021, Chu et al., 2021, Sirois, Owens, 2021)*.

The purpose of this research was to analyze the perseverance of nurses during the COVID-19 pandemic and to investigate impact of age, gender, education level, work experience, and the workplace on their perseverance.

METHODOLOGY

A cross-sectional study was conducted on a convenience sample of nurses at the Special Hospital for Medical Rehabilitation Krapinske Toplice (SHKT). Respondents worked at the COVID Ward, the Reanimation and Intensive Care Ward, the Internal Medicine Ward, the Neurological Patients' Medical Rehabilitation Ward, the Craniocerebral Patients' Medical Rehabilitation and Acute Treatment Ward, the Cardiac Patient' Medical Rehabilitation Ward, the Vertebrological Patients' Medical Rehabilitation Ward, the Orthopedic and Trauma patients' Medical Rehabilitation Ward, the Children's Medical Rehabilitation Ward and the Emergency Internal Medicine Clinic. The study on the perseverance of nurses consisted of collecting data on the sociodemographic characteristics of the respondents, such as gender, age, years of work experience, level of education and the ward they work in. The questionnaire "12-item GRIT scale", developed by psychologist Angela Duckworth, was used to measure perseverance. Permission to use the questionnaire was requested and obtained from the author of the questionnaire. The questionnaire was double translated and standardized for use in the Croatian language. Through the questionnaire, the respondent's degree of perseverance is assessed through 12 items on a Likert scale from 1 to 5. Possible answers are "completely true", "partially true", "mostly true", "partially false" and "completely false". The total result is obtained by summing the responses to all 12 items (with pre-processing of certain items and response redirection), and then dividing this sum by the number of items. This gives an overall measure of individuals' perseverance in their work on a scale from 1 (least perseverance) to 5 (most perseverance); *(Duckworth, Quinn, 2009, Duckworth et al., 2007)*.

The study was conducted in February 2021, at the end of the first year of the COVID-19 pandemic, during its third wave. The participation in the research was anonymous and voluntary. The questionnaires were delivered to the aforementioned wards in unmarked envelopes together with the informed consent form. The researchers used weekly educational meetings to personally distribute questionnaires to nursing staff who were willing to participate. Upon completion, completed questionnaires and consent forms were returned in separate

sealed and unmarked envelopes. Each subject then placed the envelopes in a box placed in the nurses' room on each ward. The head nurses of the ward collected the boxes and returned them to the head researcher.

The collected data was analyzed using descriptive statistics methods (frequencies, arithmetic mean and range of results for the perseverance in work variable), non-parametric tests (Mann-Whitney U test and Kruskal-Wallis test), and the t-test for independent samples. Results are presented at a significance level of $P < 0.05$.

The data analysis was performed using the IBM SPSS 24TM program for statistical analysis.

The research was conducted with the approval of the Ethics Committee of the University of Zagreb School of Medicine (UR. number: 380-59-10106-21-111/58; Class: 641-01/21-02/01) and the Ethics Committee of the Special Hospital for Medical Rehabilitation Krapinske Toplice (UR. Number: 05-49/1-2021).

RESULTS

Study included 109 nurses out of a total of 220 nurses (49.55%) of SHKT. The sample consisted of 11.9% males and 88.1% females (Table 1).

The largest share of respondents was between 20 and 30 years old (30.3%), with up to 10 years of work experience (32.1%), a degree from medical high school (51.4%), and working at the COVID Ward (31.9%). Details of the sample are presented in Table 1.

Table 1.   Descriptive values of the sample (N=109)

Tablica 1. Opisne vrijednosti uzorka (N=109)

	Variable	f	%
Gender	Male Female	13 96	11.9% 88.1%
Age	20 to 30 years 31 to 40 years 41 to 50 years 51 to 60 years Over 60 years	33 21 28 25 2	30.3% 19.3% 25.7% 22.9% 1.8%
Work Experience	Up to 10 years 10 to 20 years 20 to 30 years More than 30 years	35 18 27 29	32.1% 16.5% 24.8% 26.6%
Education Level	Medical High School Undergraduate Professional Nursing Study Specialist Graduate Professional Nursing Study University Graduate Professional Nursing Study	56 47 3 3	51.4% 43.1% 2.8% 2.8%
Ward	COVID Neurological Patients' Medical Rehabilitation Internal Medicine Orthopedic and Trauma patients' Medical Rehabilitation Reanimation and Intensive Care Craniocerebral Patients' Medical Rehabilitation and Acute Treatment Cardiac Patient' Medical Rehabilitation Vertebrological Patients' Medical Rehabilitation Children's Medical Rehabilitation Emergency Internal Medicine Clinic	36 20 10 10 8 5 5 5 5 5	31.9% 17.7% 8.8% 8.8% 7.1% 4.4% 4.4% 4.4% 4.4% 4.4%

Note: f - frequency, % - percentage

The mean value of the variable "Perseverance in work" was 3.59 ±0.49. The internal reliability coefficient Cronbach alpha was 0.55 (Table 2).

Table 2.   Descriptive presentation of the perseverance in work variable

Tablica 2. Deskriptivni prikaz varijable ustrajnost u radu

N=109	$\underline{X}$	SD	min	max	α
Perseverance in work	3.59	0.49	2.50	4.92	0.55

Note: $\underline{X}$ - arithmetic mean (average result), SD - standard deviation (dispersion), min - the lowest obtained result, max - the highest obtained result, α - coefficient of internal reliability Cronbach alpha

To analyze the influence of age and the length of service on the perseverance of nurses a non-parametric Kruskal-Wallis test was used because the conditions for a one-way analysis of variance were not met (Leven's test of homogeneity of variance was significant) neither for age nor for the length of service. The results showed that the highest level of perseverance was recorded in respondents aged 51 to 60 years (3.66), while the lowest level was recorded in respondents aged 41 to 50 years (3.53). No statistically significant difference was found in perseverance regarding the age of the nurses (Table 3).

Regarding the length of service, the highest level of perseverance was recorded among those with 20 to 30 years of service (3.60). No statistically significant difference was found in perseverance regarding the length of service of nurses (Table 3).

The non-parametric Mann-Whitney test was used to examine the perseverance of nurses by gender due to the significant difference in the number of male and female respondents. The results showed no statistically significant difference in perseverance between men and women (3.71 vs 3.57); (Table 3).

A t-test for independent samples was used to analyze the perseverance of nurses regarding the ward they work in. The results showed no statistically significant difference in perseverance between nurses working in the COVID Ward and those working in other wards within SHKT (3.66 vs 3.54); (Table 3).

The perseverance of nurses regarding the level of education was examined with the non-parametric Kruskal-Wallis test since the condition for performing a one-way analysis of variance was not met (Leven's test of homogeneity of variance was significant). A statistically significant difference was obtained in the perseverance of nurses regarding the level of education (P=0.042). The highest score on the perseverance questionnaire was obtained by those respondents who completed a specialist graduate professional study (4.22), they do not differ in their score from those who completed a university graduate professional study (3.97), but they differ statistically significantly from those who completed medical high school (3.60) and undergraduate professional studies (3.51), and they achieve a higher score than them. The next highest score is achieved by those who completed a university graduate professional study (3.97), but they do not statistically significantly differ from the other groups. Those participants who completed an undergraduate professional nursing study achieve the lowest result (3.51), and they do not differ from those who completed medical high school and a university graduate professional study, but they statistically significantly achieve a lower result than those who completed a specialist graduate professional study (Table 3).

Table 3. Differences in perseverance depending on age, gender, the length of service, ward they work in and level of education of nurses

Tablica 3. Razlike u ustrajnosti ovisno o dobi, spolu, radnom stažu, odjelu na kojem rade i stupnju obrazovanja medicinskih sestara

	Age	N	$\overline{X}$	p
Perseverance	20 to 30 years	32	3.57	
	31 to 40 years	21	3.61	
	41 to 50 years	28	353	0.928
	51 to 60 years	25	3.66	
	Over 60 years	2	3.58	
	Gender	N	M	p*
	Male	13	3.71	0.464
	Female	96	3.57	
	Work Experience	N	$\overline{X}$	p
	Up to 10 years	34	3.58	
	10 to 20 years	18	3.58	0.958
	20 to 30 years	27	3.60	
	More than 30 years	29	3.59	
	Ward	N	$\overline{X}$	p**
	COVID Ward	36	3.66	0.192
	Other wards	73	3.54	
	Education Level	N	$\overline{X}$	p
	Medical High School	56	3.60	
	Undergraduate Professional Nursing Study	46	3.51	**0.042**
	Specialist Graduate Professional Study	3	4.22	
	University Graduate Professional Study	3	3.97	

* Mann-Whitney U test

** t-test for independent samples

DISCUSSION

The aim of this research was to investigate the perseverance of nurses during the COVID-19 pandemic. According to the European Commission report *(2021)*, nurses make up the largest group in the health sector and were also the most exposed group of health workers during the pandemic. In November 2020, the Krapina-Zagorje County (KZC) recorded the largest increase in the number of patients in a 14-day period, which resulted in the establishment of a COVID Ward in SHKT *(2021)*. As declared by the Government of the Republic of Croatia *(2021)*, that decision brought new and unexpected challenges.

In times of pandemic and under extraordinary conditions, nurses perform their professional duties in accordance with the education they have acquired. They possess the knowledge and skills necessary for providing adequate care to patients at all stages of disease, as well as for providing support and information to people in the community who are worried and who want to stay healthy. Throughout history, nurses have demonstrated the ability to think outside the box and find creative and innovative solutions to various problems and challenges. However, the pandemic made many new and frightening situations a reality, such as the rapid spread of the virus, which requires a continuous, 24 hours fight (*Thobaity, Alshammari, 2020)*. A systematic literature review conducted by Thobaityi and Alshammari showed that nurses faced numerous challenges during the COVID-19 pandemic, such as lack of protective

equipment and other resources, lack of staff, loss of colleagues, feelings of anxiety, nervousness, fear, and vulnerability due to disease exposure *(Thobaity, Alshammari, 2020)*.

A study by Huffman et al. *(2021)* among 785 healthcare workers in Indiana, USA, showed that most participants felt significantly more stressed during the COVID-19 pandemic. The main source of stress was the fear of transmitting the infection to their families, while managing personal and systemic stress levels during the peak of the pandemic was facilitated by increased resilience and perseverance.

Perseverance is an important trait during extraordinary circumstances because people who possess it actively participate in their work and are able to persevere despite negative or difficult conditions. They are motivated and flexible in using different strategies to achieve goals, and they overcome difficulties more easily. Nurses possess perseverance, which is evident from their challenging educational path to the carrying out of the essence of their calling in their daily work *(Duckworth, Gross, 2014, Huffman et al., 2021)*.

Given that nurses participate in all phases of work during situations of crisis, we investigated the level of their perseverance at work and analyzed whether age, gender, the level of education, work experience and their workplace had an impact on their perseverance during the COVID-19 pandemic in SHKT. In our study, the average value of perseverance among nurses was 3.59 ± 0.49 on a scale of one to five, with five representing the highest level of perseverance. Data on the level of perseverance in the nursing profession during the COVID-19 pandemic is scarce. Chu et al. *(2021)* study of 230 nurses working in pediatric wards in Korea showed a mean perseverance value of 3.10 ± 0.39 during the COVID-19 pandemic. Nurses with higher levels of perseverance in their study were more willing to provide care to patients during a pandemic and had more positive attitudes about their own readiness to provide care in emergency circumstances *(Chu et al., 2021)*.

In our research, we noticed a significantly lower number of males compared to female (11.9% vs. 89.1%). This disparity between genders and professions can be explained by the historical context in which nursing was a predominantly female profession. However, in recent years there has been an increasing trend in the number of males in the nursing profession, which is the result of raising awareness and reducing stereotypes *(Licul, 2014)*.

Additionally, in our research, we did not find significant differences in the level of perseverance among the respondents regarding their age, gender, length of service and the ward where they work in. However, we observed a significant difference in the level of perseverance regarding the level of education. Respondents who completed specialist graduate professional studies achieved the highest score on the perseverance questionnaire (4.22), which is significantly higher than those who completed medical high school (3.60) and undergraduate professional studies (3.51).

Similar results were obtained by Terry and Peck *(2020)* in their study of 422 nursing students in Australia. Their research showed a mean perseverance value among the respondents of 3.8. They did not find a statistically significant difference regarding age, but they found an increase in the level of perseverance with age. They determined a significant difference in the level of perseverance regarding the year of study, where second and third year students had a significantly higher score compared to first year students, as well as regarding the self-assessment of academic and clinical performance, where students with the highest perseverance scores were the ones who evaluated their own success as high.

According to Sibandaze and Scafide *(2018)*, nurses who graduated in nursing or achieved higher academic education showed greater awareness of professional values and their application in practice compared to nurses with lower academic education. Nurses with higher education have also embraced professional values as a foundation for providing quality health care. The level of education of nurses seems to play an important role in developing awareness of professional values and their integration into practice.

This research has certain methodological flaws, such as the imbalance of the number of respondents by gender, with the dominance of the

female gender. Also, the research was conducted on a convenience sample and not all SHKT health workers participated in the research. The coefficient of internal reliability, Cronbach alpha, was 0.55, which shows the moderate reliability of the measuring instrument. A possible reason for this may be the small number of respondents, so the further studies should be conduct on a representative sample of nurses.

The strength of this research lies in the use of double translation and a standardized measurement instrument, as well as in the uniqueness of the implementation of the research on the perseverance of nurses during the COVID-19 pandemic.

CONCLUSION

The results of the research show that nurses in SHKT had a high level of perseverance (average 3.59±0.49) during the COVID-19 pandemic, regardless of age, gender, length of service or the ward where they worked.

A significantly higher level of perseverance (P=0.042) was found among respondents who completed specialist graduate professional studies (4.22) compared to those who completed medical high school (3.60) and undergraduate professional studies (3.51), which suggests that the educational level may have an impact on the perseverance of nurses during a pandemic.

These results indicate the need for further research on a representative sample of nurses to gain a deeper understanding of how the pandemic affects their perseverance. Additional research could provide deeper insight into the factors that influence nursing staff perseverance, as well as possible interventions and support that could be provided to preserve their well-being and ability to provide quality healthcare during challenging times such as a pandemic.

It is interesting that in our research, respondents who worked in the COVID Ward showed a higher level of perseverance compared to those who worked in other wards, although a statistically significant difference was not determined (3.66 vs. 3.54). These results point to the conclusion that the nurses in our research showed high professionalism and perseverance in fighting the pandemic and providing healthcare to patients even during the COVID-19 pandemic and extreme working conditions, as well as the threats to their own health and the health of their families.

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USTRAJNOST (GRIT) MEDICINSKIH SESTARA/TEHNIČARA U VRIJEME PANDEMIJE COVID-19

SAŽETAK: Pandemija COVID-19 donijela je brojne nove izazove cijelom društvu, a posebno zdravstvenim sustavima, pa tako i medicinskim sestrama koje su morale smoći snage i ustrajnosti da prebrode sve prepreke i izazove. Cilj ove studije bio je istražiti razinu ustrajnosti medicinskih sestara i tehničara tijekom pandemije COVID-19 istražiti utjecaj dobi, spola, stupnja obrazovanja i radnog iskustva na njihovu ustrajnost. Istraživanje je provedeno na 109 sudionika, od kojih je 88,1 % bilo ženskog spola. Kao instrument istraživanja korišten je validirani upitnik GRIT. Podaci su analizirani deskriptivnom i analitičkom statistikom, s prikazom značajnosti na razini P<0,05. Analizom prikupljenih podataka utvrđena je prosječna vrijednost ustrajnosti 3,59±0,49. Nije bilo razlika u ustrajnosti između sudionika s obzirom na dob, spol, odjel na kojem rade te radno iskustvo. Statistički značajna razlika utvrđena je s obzirom na razinu obrazovanja. Najvišu razinu ustrajnosti u radu pokazale su medicinske sestre/tehničari s diplomom specijalističkog stručnog studija (4,22) ili sveučilišnog diplomskog stručnog studija (3,97), dok je najniža razina ustrajnosti zabilježena kod onih sa završenim preddiplomskim stručnim studijem sestrinstva (3,51; P=0,042). Rezultati istraživanja upućuju na razlike u razini ustrajnosti medicinskih sestara/tehničara ovisno o razini obrazovanja, ali ne i o radnom mjestu. Istraživanje o ustrajnosti medicinskih sestara i tehničara ima važnost za daljnji razvoj sestrinske profesije.

Ključne riječi: pandemija, COVID-19, medicinske sestre/tehničari, ustrajnost, GRIT