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STAVOVI SUDENATA ZDRAVSTVENE NEGE O PRAĆENJU VITALNIH ZNAKOVA PACIJENATA

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SAŽETAK

Uvod/Cilj: Podaci o stavovima studenata sestrinstva prema praćenju vitalnih znakova pacijenata su insuficijentni. Cilj ove studije je bio da se ispitaju stavovi studenata o praćenju vitalnih znakova pacijenata.
Metode: Istraživanje je sprovedeno u vidu studije preseka anketiranjem 193 studenta Osnovnih akademskih studija zdravstvene nege i Osnovnih strukovnih studija zdravstvene nege na Medicinskom fakultetu u Novom Sadu. Za prikupljanje podataka korišćen je opšti upitnik i V-skala.
Rezultati: Stav većine studenata zdravstvene nege (88,6%) o praćenju vitalnih znakova pacijenata Medicinskog fakulteta u Novom Sadu, prema ukupnom skoru V-skale, je bio ambivalentan. Najveći broj studenta (91,7%) je iskazalo pozitivan stav prema tvrdnjama vezanim za praćenje vitalnih znakova pacijenata u domenu „komunikacija“, ambivalentan u domenu „tehnologija“ (61,1%) i negativan u domenu „ključni indikatori“ (28,0%). Analiza stava studenata o praćenju vitalnih znakova pacijenata u odnosu na pol je pokazala da značajna razlika postoji samo u domenu „komunikacija“. Vrednost prosečnog skora u domenu „komunikacija“ je bila značajno niža među muškarcima (4,04±0,75) nego među ženama (4,37±0,67). Studenti koji su završili stručnu srednju školu imali su značajno više vrednosti prosečnog skora u domenu „znanje“ (3,44±0,72) nego studenti koji su prethodno završili gimnaziju ili neku drugu školu (3,13±0,86), ali značajna razlika nije dobijena za druge domene V-skale. Studenti starijih godina, u odnosu na studente prve godine, su imali značajno niže vrednosti prosečnog skora u domenu „komunikacija“ i domenu „znanje“.
Zaključak: Dobijeni rezultati našeg istraživanja, pored naučnog, imaju i stručni značaj, jer se na osnovu njih mogu kreirati pedagoške implikacije, kao osnova za unapređenje postojećih nastavnih sadržaja kliničkih vežbi na studijama zdravstvene nege.

Ključne reči: studenti sestrinstva, vitalni znaci, stavovi

Uvod

Vitalni znaci su jedan od važnih indikatora zdravstvenog stanja pacijenta koji daju informacije o funkcionisanju različitih sistema organa, kao što su respiratorni, kardiovaskularni, endokrini i nervni sistem (1).

Svaka promena vitalnih znakova je preteča promena u funkcijama organizma, gde neadekvatna procena vitalnih znakova predstavlja propuštenu priliku da se otkrije kliničko pogoršanje stanja pacijenta (2). Merenje, procena i beleženje vitalnih znakova spada u bazične kliničke veštine medicinskih sestara (1,3). S obzirom na to da se promene u opštem stanju pacijenata odražavaju na vitalne znake, odgovornost studenata zdravstvene nege je da zna i sprovede odgovarajuće postupke za novonastale promene.

Literaturni podaci ukazuju na nekoliko izazova u vezi sa vitalnim znacima i drugim metodama fizičke procene pacijenata koje su sprovodili studenti zdravstvene nege (4). Tako je studija sprovedena u Južnoj Africi (5) pokazala da studenti zdravstvene nege imaju poteškoća da identifikuju rane znake pogoršanja stanja pacijenata na osnovu procenjenih vitalnih znakova. Rezultati prethod-

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NURSING STUDENTS` ATTITUDES TOWARDS MONITORING PATIENTS' VITAL SIGNS

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SUMMARY

Introduction/Aim: Data on the attitudes of nursing students towards the monitoring of patients' vital signs are insufficient. The aim of this study was to examine the attitudes of students towards the monitoring of patients' vital signs.
Methods: The research was conducted as a cross-sectional study, by surveying 193 students of Undergraduate Academic Studies in Nursing and Undergraduate Applied Studies in Nursing at the Faculty of Medicine in Novi Sad. The data were collected using the general questionnaire and V-scale.
Results: The attitude of the majority of nursing students (88.6%) regarding the monitoring of patients' vital signs at the Faculty of Medicine in Novi Sad, according to the total score of V-scale, was ambivalent. The largest number of students (91.7%) expressed a positive attitude towards the statements in the domain of communications, ambivalent in the domain of technologies (61.1%), and negative in the domain of key indicators (28.0%). The analysis of students' attitudes towards vital signs monitoring in relation to gender showed a significant difference in the domain of communication. The value of the average score in the domain of communication was significantly lower in men (4.04±0.75) than in women (4.37±0.67). Students who had completed vocational secondary school had significantly higher values of average score in the domain of knowledge (3.44±0.72) in comparison to students who had previously completed high school or some other school (3.13±0.86), but the significant difference was not obtained for the other domains of V-scale. The students of final years in comparison to first-year students had significantly lower values of average score in the domains of communication and knowledge.
Conclusion: The obtained results of our study, in addition to the scientific one, also have professional significance, because pedagogical implications can be created based on them, as a basis for improving the existing content of clinical training in nursing studies.

Key words: nursing students, vital signs, attitudes

Introduction

Vital signs present one of the important indicators of patient's health condition, and they provide information about the functioning of various systems of organs, such as the respiratory, cardiovascular, endocrine and nervous system (1).

Every change in vital signs is a precursor of changes in the body's functions, where the inadequate assessment of vital signs represents a missed chance to detect the clinical worsening of the patient's condition (2). Measuring, assessing and recording vital signs represents a basic clinical skill of nurses (1,3). Given that changes in the general condition of patients affect vital signs, it is the responsibility of nursing students to know and implement appropriate procedures in case of new changes.

Literature data indicate several challenges in relation to vital signs and other methods of physical assessment of patients, which were conducted by nursing students (4). Thus, a study conducted in South Africa (5) showed that nursing students had difficulty identifying the early signs of deterioration in patients, based on the vital signs which they assessed. The results of the

no navedenog istraživanja pokazuju i da studenti često odlažu prijavljivanje promene u vitalnim znacima zdravstvenim radnicima. Studenti su identifikovali i više prepreka pri monitoringu vitalnih znakova. Kao prepreke naveli su da se merenje vitalnih znakova vrši samo kada se zdravstveno stanje pacijenta pogorša, nedostatak vremena, nedostatak poverenja u obavljanje procene i prekide tokom procene (6).

Prema rezultatima studije sprovedene u Australiji, studenti zdravstvene nege često nisu spremni da sprovedu osnovne zadatke u vezi sa procenom zdravstvenog stanja pacijenata uprkos adekvatnoj pripremi tokom studiranja, a izjasnili su se i da imaju poteškoće da znanje iz učionice primene u kliničkoj praksi, posebno kada je u pitanju procena kliničkog pogoršanja zdravstvenog stanja pacijenta (7).

Skoro polovina studenata zdravstvene nege uključena u istraživanje sprovedeno u Saudijskoj Arabiji (4), izjasnila se da ima neadekvatno znanje o praćenju vitalnih znakova pacijenata u kliničkom okruženju, a više od polovine njih je bilo ambivalentno ili je imalo negativan stav o svojim sposobnostima povezivanja praćenja vitalnih znakova sa bolestima pacijenata. Utvrđena je i razlika u stavovima studenata zdravstvene nege u odnosu na pol i godinu studija. Studenti zdravstvene nege muškog pola iskazali su pozitivniji stav prema domenima „tehnologija“ i „ključni indikatori“ u odnosu na studente ženskog pola. Suprotno tome, studentkinje zdravstvene nege su u domenu „komunikacija“ iskazale pozitivniji stav u odnosu na studente muškog pola. Studenti druge godine iskazali su negativniji stav prema tvrdnjama u domenu „tehnologija“ u odnosu na studente treće i četvrte godine. Suprotno tome, studenti zdravstvene nege druge godine imalu su pozitivnije stavove u domenu „komunikacija“ u odnosu na studente treće i četvrte godine. Takođe, studenti druge godine iskazali su pozitivniji stav i u domenu „radne obaveze“ u odnosu na studenata četvrte godine (4).

Smatra se da nivo znanja studenata zdravstvene nege o vitalnim znacima utiče na njihove veštine i stav. U literaturi se navodi da medicinske sestre ne mere i ne beleže dosledno vitalne znake i zanemaruju praćenje vitalnih znakova pacijenata iz različitih razloga (stava medicinskih sestara da je praćenje frekvencije disanja nešto što oduzima vreme, prisustva prekida tokom procene, male važnosti koja se pridaje proceni vitalnih znakova) (3,8). S obzirom na prethodno navedeno ističe se neophodnost razvijanja pozitivnih stavova o praćenju vitalnih znakova pacijenta kod budućih medicinskih sestara, koji imaju značajno mesto u pravilnoj upotrebi teorijskih znanja u praksi (3,8). Stavovi medicinskih sestara prema vitalnim znacima podrazumevaju način na koji prate vitalne znake u kliničkoj nezi i kako primenjuju svoje znanje u praksi (9). Pozitivan stav studenata prema značaju tumačenja vitalnih znakova omogućava studentima zdravstvene nege da pravilnom metodom mere i beleže vitalne znake pacijenata koliko god je to potrebno, procenjuju i tumače dobijene rezultate, planiraju i sprovode neophodne intervencije u abnormalnim situacijama. Stoga će unapređenje stavova studenata zdravstvene nege prema vitalnim znacima doprineti da studenti vrše tačna i blagovremena merenja, obezbeđuju bezbednost pacijenata i donose ispravne kliničke odluke u praksi (4). Cilj ove studije je bio da se ispitaju stavovi studenata zdravstvene nege o praćenju vitalnih znakova pacijenata.

Metode

Istraživanje je sprovedeno u vidu studije preseka anketiranjem 193 studenta Osnovnih akademskih studija zdravstvene nege i Osnovnih strukovnih studija zdravstvene nege na Medicinskom fakultetu u Novom Sadu u periodu od 05. 05. 2022. godine do 21. 06. 2022. godine. Podaci su prikupljeni anonimnim upitnikom, a distribucija upitnika i prikupljanje podataka, u populaciji studenata zdravstvene nege, sproveo je student-istraživač u saradnji sa mentorom. U dogovoru sa predmetnim nastavnikom, upitnici su distribuirani na kraju predavanja u papirnoj formi. U toku popunjavanja je obezbeđena fizička distanca, u cilju obezbeđivanja privatnosti studentima. Dužina trajanja popunjavanja upitnika je bila 20 minuta. Studentima je predočen sadržaj Pisane informacije za ispitanika, potom su istu dobili da pročitaju, kao i Saglasnost za ispitanika koju potpisuju ukoliko su saglasni da učestvuju u istraživanju. Distribuirano je 232 upitnika, a u celosti su vraćena 193, ukupna stopa odgovora iznosila je 83,2 %.

Kriterijum za uključivanje studenata u istraživanje su: da su odslušali nastavu iz predmeta Opšta zdravstvena nega I, gde su obrađeni nastavni sadržaji vezani za vitalne funkcije, da su dali pisanu saglasnost da žele da učestvuju u studiji i da su dali odgovor na sva pitanja u upitniku.

above mentioned study also showed that students often postponed reporting changes in vital signs to health professionals. Students also identified several obstacles in monitoring vital signs. They mentioned the following obstacles: measurement of vital signs was performed only when the patient's health condition worsened, lack of time, lack of trust in performing the assessment and interruptions during the assessment (6).

According to the results of one study, which was conducted in Australia, nursing students were often not prepared to carry out basic tasks related to the assessment of the patient's health condition, in spite of the adequate preparation during their studies, and they stated that they had difficulties applying the knowledge in clinical practice, especially when it comes to the assessment of clinical deterioration of patient's health (7).

Almost half of the nursing students included in the research conducted in Saudi Arabia (4) stated that their knowledge about monitoring patients' vital signs in the clinical environment was inadequate, while more than half of them had an ambivalent or negative attitude towards their ability to associate vital signs monitoring with patients' diseases. The difference in attitudes of nursing students was established in relation to their gender and year of studies. Male nursing students showed a more positive attitude towards the domains of technology and key indicators in comparison to female students. On the contrary, female nursing students had a more positive attitude regarding the domain of communication in comparison to male students. Second-year students had a more negative attitude towards statements in the domain of technology in comparison to students of third and fourth year. On the contrary, second-year students had more positive attitudes towards communication in comparison to third and fourth-year students. Also, second-year students showed a more positive attitude in the domain of their work duties in comparison to fourth-year students (4).

It is believed that the level of knowledge of nursing students affects their skills and attitudes. It is stated in the literature that nurses do not measure and record vital signs consistently and fail to monitor patients' vital signs due to various reasons (nurses' attitudes that monitoring the respiratory rate is time-consuming, interruptions during monitoring, little importance that is given to vital signs assessment) (3,8). Taking into consideration the above mentioned, the necessity of developing positive attitudes about monitoring the patient's vital signs in future nurses is emphasized, because they are significant in the adequate implementation of theoretical knowledge in practice (3,8). The nurses' attitudes towards vital signs include the way they monitor vital signs in clinical practice and how they apply their knowledge in practice (9). The students' positive attitude towards the importance of vital signs interpretation enables nursing students to correctly measure and record patients' vital signs as much as necessary, to assess and interpret the obtained results, plan and implement necessary interventions in abnormal situations. Therefore, improving the students' attitudes towards vital signs will contribute to students making accurate and timely measurements, ensuring patients' safety and making correct decisions in clinical practice (4). The aim of this study was to examine the attitudes of nursing students towards the monitoring of patients' vital signs.

Methods

The research was conducted as a cross-sectional study and it included 193 students of Undergraduate Academic Studies in Nursing and Undergraduate Applied Studies in Nursing at the Faculty of Medicine in Novi Sad from May 5th, 2022 to June 21st, 2022. The data were collected with the help of the anonymous questionnaire, while the student-researcher distributed and collected data in the population of nursing students in cooperation with his mentor. In agreement with the teacher, the questionnaires were distributed at the end of the lecture in the paper form. Physical distance was ensured while students were filling out the questionnaire, which was aimed at ensuring the privacy of students. The students had twenty minutes to fill out the questionnaire. They were presented with the content of the Written Information for the Respondent, and then they were given time to read it, as well as the Consent for the Respondent, which they had to sign if they agreed to participate in the study. 232 questionnaires were distributed, and 193 were returned in full, so the total response rate was 83.2%.

The inclusion criteria for the students were the following: that they attended classes of General Health Care I, where the content related to vital signs was covered, that they gave their consent to

Kriterijum za isključivanje studenata iz istraživanja su: da nisu odslušali Opštu zdravstvenu negu I, da ne žele da učestvuju u istraživanju i da nisu dali odgovore na sva pitanja u upitniku. Studentima koji ispunjavaju kriterijume za uključivanje u studiju najpre je detaljno opisan razlog, značaj i način sprovođenja istraživanja.

Protokol istraživanja kreiran je na osnovu najnovijih istraživanja i čine ga socio-demografski upitnik i V-skala (eng. V-SCALE). Socio-demografski upitnik je sadržao pitanja koja se odnose na socio-demografske karakteristike ispitanika (pol, prethodno završena srednja škola, godina studija i radno iskustvo). Stavovi studenata zdravstvene nege o praćenju vitalnih znakova pacijenata tokom kliničkih vežbi procenjivani su pomoću revidirane V-skale, koju je kreirao Mok sa saradnicima 2015. godine (9). Inicijalno V-skala je dizajnirana za procenu stavova medicinskih sestara o praćenju vitalnih znakova radi otkrivanja kliničkog pogoršanja stanja pacijenata. Revidirana V-skala je prilagođena studentima zdravstvene nege. Revizija se odnosi na tri tvrdnje. U 5. i 6. tvrdnji dodato je pored odgovorne medicinske sestre obavestiće se i nastavnici angažovani u održavanju praktične nastave, a u 16. umesto medicinska sestra/tehničar je napisano studenti zdravstvene nege. Skalu čini 16 tvrdnji podeljenih u 5 domena. Prvi domen „tehnologija“ koji čine prve četiri tvrdnje, procenjuje stavove studenta o primeni tehnologije u praćenju vitalnih znakova. Naredna dva pitanja čine domen „komunikacija“, a tvrdnje 7, 8, 9 i 10 čine domen „radne obaveze“ i ukazuju na stavove studenata zdravstvene nege o praćenju vitalnih znakova kao njihovim radnim obavezama. Domen „ključni indikatori“ čine tvrdnje 11, 12 i 13 koje ukazuju na stavove studenata zdravstvene nege o praćenju vitalnih znakova koji se smatraju ključnim pokazateljima kliničkog pogoršanja pacijenta, dok preostale tri tvrdnje čine peti domen „znanje“. Stavovi studenata se procenjuju petostepenom Likertovom skalom od 1 do 5, pri čemu je 1- uopšte se ne slažem, a 5 potpuno se slažem. Pri statističkoj obradi podataka sve tvrdnje izuzev 5, 6 i 14 su se skorovale reverzno. Skor se izračunava za celu skalu i za svaki domen ponaosob, pri čemu niže vrednosti ukazuju na negativne, a više na pozitivnije stavove studenata o praćenju vitalnih znakova pacijenata (4). Ukupni skor se može kretati od 16 do 80, pri čemu vrednost 16-37 ukazuje na negativan stav, 38-59 ambivalentan, a 60-80 na pozitivan stav studenata zdravstvene nege o praćenju vitalnih znakova pacijenata. Za svaki domen izračunava se prosečan skor, pri čemu vrednosti od 1 do 2,49 ukazuju na negativan, 2,50 do 3,49 ambivalentan i 3,50 do 5,00 na pozitivan stav studenata.

Analiza podataka je obuhvatila metode deskriptivne i inferencijalne statistike. Numeričke varijable su prikazane putem srednje vrednosti (aritmetička sredina) i mera varijabiliteta (opseg vrednosti, standardna devijacija), a atributivne varijable korišćenjem frekvencija i procenata.

Testiranje razlika u distribuciji vrednosti numeričkih varijabli se vršilo primenom parametarskog Student-ovog t-testa u slučaju dve grupe podataka i jednofaktorskom analizom varijanse (eng. *one-way analysis of variance*, *one-way ANOVA*) sa odgovarajućim naknadnim testom (*post hoc test*) za tri ili više grupa podataka.

Veličina efekta (engl. *size effect*) je korišćena kao statistički pokazatelj koji daje bolji uvid u rezulatate istraživanja, to jest koliki je učinak nezavisne promenljive, a ne samo da li on postoji ili ne. Za izračunavanje veličina uticaja za numeričke varijable je korišćen Koenov d (*Cohen's d*) i eta kvadrat (η^2), pri čemu je korišćena sledeća interpretacija: d=0,2 ili η^2=0,01 slab efekat, d=0,5 ili η^2=0,06 srednji efekat i d =0,8 ili η^2=0,14 jak efekat.

Pearson-ov koeficijent linearne korelacije (r) korišćen je za određivanje stepena povezanosti između numeričkih varijabli.

Statistički značajnom smatrala se vrednost nivoa značajnosti $p < 0,05$.

Za statističku obradu podataka korišćen je programski paket IBM SPSS (eng. S*tatistical Package for Social Sciences*) verzija 28.

Komisija za etičnost ispitivanja Medicinskog fakulteta Novi Sad Univerziteta u Novom Sadu dala je saglasnost za sprovođenje anketnog istraživanja, zavedenu pod brojem: 01-39/147/1 dana 01. 02. 2022. godine.

Rezultati

Od 193 studenta koji su učestvovali u istraživanju 82,9% je bilo ženskog pola, a 17,1% muškog pola. Dve trećine studenata je završilo stručnu, odnosno medicinsku srednju školu, dok je opštu srednju školu tj. gimnaziju završilo 20,2% studenata, a samo 2,1% studenata je srednjoškolsko obrazovanje završilo u nekoj drugoj školi. Među studentima sa završenim srednjim stručnim obrazovanjem 64,7% studenata je pohađalo obrazovni

participate in the study and that they answered all the questions from the questionnaire.

The exclusion criteria included the following: that the students did not attend General Health Care I, that they did not want to take part in the study and that they did not answer all the questions in the questionnaire. The reason, significance and method of conducting the study were described in detail to students who fulfilled the inclusion criteria.

The protocol of the study was created based on the latest research and it included the socio-demographic questionnaire and V-scale. The socio-demographic questionnaire contained questions related to the socio-demographic characteristics of respondents (gender, previously completed high school, year of studies and work experience). The attitudes of nursing students towards vital signs monitoring during practical training were assessed using the revised V-scale , which was created by Mok and associates in 2015 (9). Initially, V-scale was designed to assess nurses' attitudes to vital signs monitoring in order to detect clinical deterioration in patients. The revised V-scale was adapted for nursing students. The revision related to three statements. In the 5th and 6th statement, it was added that in addition to the nurse on duty, the teachers engaged in practical training would also be notified, while in the 16th statement, nurse/technician was replaced by nursing students. The scale included 16 statements divided into 5 domains. The first domain of technology, which included the first four statements, evaluated the students' attitudes towards the application of technology in vital signs monitoring. The next two questions related the domain of communication, while statements 7, 8, 9 and 10 were related to the domain of work duties and pointed to the nursing students' attitudes towards vital signs monitoring as their work duties. The domain of key indicators consists of statements 11, 12 and 13 which point to the attitudes of nursing students towards the monitoring of vital signs, which are considered to be the key indicators of clinical deterioration of patients, while the remaining three statements constitute the fifth domain – knowledge. Students' attitudes are evaluated on a five-point Likert scale from 1 to 5, where 1 – completely disagree, and 5 – completely agree. During the statistical analysis of data, all statements, except statements 5, 6 and 14, were scored in reverse. The score is calculated for the entire scale and for each domain separately, with lower values indicating more positive attitudes of students about vital signs monitoring (4). The total score can range from 16 to 80, while the value 16-37 indicates a negative attitude, 38-59 ambivalent, and 60-80 a positive attitude of nursing students towards monitoring patients' vital signs. The average score is calculated for each domain, while values from 1 to 2.49 indicate a negative, 2.50-3.49 ambivalent and 3.50-5.00 positive students' attitude.

The analysis of data included methods of descriptive and inferential statistics. Numerical variables are presented using the mean value (arithmetic mean) and measures of variability (value range, standard deviation), while attributive variables are presented using frequencies and percentages.

Testing of differences in the distribution of values of numerical variables was performed using the parametric Student's t-test in the case of two groups of data and one-factor analysis of variance (ANOVA) with the corresponding subsequent test (post hoc test) for three or more groups of data.

The size effect was used as a statistical indicator that gives a better insight into the results of the research, that is, what is the effect of the independent variable, and not just whether it exists or not. Cohen's d and eta square (η^2) were used to calculate the size effect, while the following interpretation was used: d=0.2 or η^2=0.01 a small effect, d=0.5 or η2=0.06 a medium effect and d=0.8 or η^2=0.14 a large effect.

Pearson's linear correlation coefficient (r) was used to determine the degree of correlation between numerical variables.

The value $p<0.05$ was considered to be statistically significant.

The program package IBM SPSS (Statistical Package for Social Sciences), version 28 was used for the statistical analysis of data.

The Ethics Committee of the Faculty of Medicine, University of Novi Sad gave consent to conduct a survey, which was registered under the number: 01-39/147/1 on February 1st, 2022.

Results

Of the 193 students who participated in the study, 82.9% were female, while 17.1% were male. Two thirds of students have completed vocational, that is, medical high school, 20.2% of students

Tabela 1. Distribucija odgovora studenata zdravstvene nege (N=193) na tvrdnje iz V - skale

Domen	Redni broj	Tvrdnje	Uopšte se ne slažem n (%)	Ne slažem se n (%)	Nisam siguran/a n (%)	Slažem se n (%)	Potpuno se slažem n (%)
Tehnologija	1.	Vrednost frekvencije disanja u toku rutinskog praćenja vitalnih znakova se uglavnom procenjuje za stabilne pacijente	49 (25,4)	61 (31,6)	41 (21,2)	23 (11,9)	19 (9,8)
	2.	Elektronsko praćenje vitalnih znakova je jednostavniji način praćenja (npr. brojanje) frekvencije disanja	0 (0,0)	6 (3,1)	17 (8,8)	82 (42,5)	88 (45,6)
	3.	Upotreba pulsnog oksimetra za praćenje saturacije kiseonika u krvi će smanjiti potrebu za praćenjem frekvencije disanja	35 (18,1)	58 (30,1)	47 (24,4)	30 (15,5)	23 (11,9)
	4.	Smatram da je frekvencija disanja u prihvatljivom opsegu, odnosno od 12 do 20 u minuti, samo ukoliko su vrednosti SpO_2 unutar normalnog opsega	7 (3,6)	25 (13,0)	56 (29,0)	59 (30,6)	46 (23,8)
Komunikacija	5.	Uveren/a sam da ću pogoršanje vitalnih znakova prijaviti na način koji će navesti odgovornu medicinsku sestru ili nastavnika vežbi da ponovo proceni stanje pacijenta*	1 (0,5)	8 (4,1)	19 (9,8)	71 (36,8)	94 (48,7)
	6.	Nastaviću sa redovnim izveštavanjem odgovorne medicinske sestre ili nastavnika vežbi o promenama u vitalnim znacima, ukoliko se nisu promptno preduzele mere*	1 (0,5)	3 (1,6)	20 (10,4)	72 (37,3)	97 (50,3)
Radne obaveze	7.	Praćenje vitalnih znakova zahteva dosta vremena	16 (8,3)	61 (31,6)	50 (25,9)	55 (28,5)	11 (5,7)
	8.	Praćenje vitalnih znakova je dosadan zadatak	65 (33,7)	67 (34,7)	37 (19,2)	16 (8,3)	8 (4,1)
	9.	Potpuno i tačno praćenje vitalnih znakova je zanemareno zbog ograničenog vremena	15 (7,8)	44 (22,8)	42 (21,8)	63 (32,6)	29 (15,0)
	10.	Osećam se preopterećeno pokušavajući da završim prikupljanje vitalnih znakova mojih pacijenata u različitoj učestalosti praćenja (na sat vremena, na 2 sata, na4 sata, itd.)	23 (11,9)	57 (29,5)	64 (33,2)	42 (21,8)	7 (3,6)
Ključni indikatori	11.	SpO_2 je pouzdaniji indikator u prepoznavanju ranih simptoma respiratorne disfunkcije od frekvencije disanja	2 (1,0)	32 (16,6)	46 (23,8)	77 (39,9)	36 (18,7)
	12.	Arterijski krvni pritisak je često prvi parametar koji ukazuje na promenu stanja kada je nastupilo pogoršanje stanja pacijenta	3 (1,6)	24 (12,4)	39 (20,2)	88 (45,6)	39 (20,2)
	13.	Vrednost frekvencije disanja je najmanje značajan znak pogoršanja stanja pacijenta	52 (26,9)	70 (36,3)	45 (23,3)	19 (9,8)	7 (3,6)
Znanje	14.	U stanju sam da povežem vrednosti vitalnih znakova sa fiziologijom i patofiziologijom postojećih bolesti*	5 (2,6)	16 (8,3)	66 (34,2)	88 (45,6)	18 (9,3)
	15.	Moje znanje u interpretaciji vitalnih znakova u cilju prepoznavanja kliničkog pogoršanja stanja pacijenta je ograničeno	14 (7,3)	72 (37,3)	47 (24,4)	50 (25,9)	10 (5,2)
	16.	Studenti zdravstvene nege nisu pravovremeno i pravilno interpretirali vitalne znake	40 (20,7)	60 (31,1)	57 (29,5)	24 (12,4)	12 (6,2)

*pozitivne tvrdnje

profil medicinska sestra/tehničar. Najveći broj studenata (42,5%) pohađao je prvu godinu studija, a zatim drugu (24,9%), treću (18,1%) i četvrtu (14,5%). Skoro svaki sedmi student (16,1%) radi ili je radio u kliničkoj praksi.

Većina studenata sestrinstva (88,1%) iskazala je pozitivan stav u odnosu na tvrdnju ,,Elektronsko praćenje vitalnih znakova je jednostavniji način praćenja (npr. brojanje) frekvencije disanja“ (tabela 1). Više od polovine studenata „smatra da je frekvencija disanja u prihvatljivom opsegu, odnosno od 12 do 20 u minuti, samo ukoliko su vrednosti SpO_2 unutar normalnog opsega“, da je SpO_2 pouzdaniji indikator u prepoznavanju ranih simptoma respiratorne disfunkcije od frekvencije disanja i da je arterijski krvni pritisak često prvi parametar koji ukazuje na promenu stanja kada je nastupilo pogoršanje stanja pacijenta. Međutim, većina studenata iskazala je pozitivan stav prema tvrdnjama „Uveren/a sam da ću pogoršanje vitalnih znakova prijaviti na način koji će navesti odgovornu medicinsku sestru ili nastavnika vežbi da ponovo proceni

Table 1. Distribution of nursing students' (N=193) responses to statements from the V-scale

Domain	Serial number	Statements	I do not agree at all n (%)	I do not agree n (%)	I am not sure n (%)	I agree n (%)	I totally agree n (%)
Technology	1.	The respiratory rate value during monitoring of vital signs is generaly assessed for stable patients	49 (25.4)	61 (31.6)	41 (21.2)	23 (11.9)	19 (9.8)
	2.	Electronic monitoring of vital signs is a simpler way of monitoring (i.e. counting) respiratory rate	0 (0.0)	6 (3.1)	17 (8.8)	82 (42.5)	88 (45.6)
	3.	The use of a pulse oximeter to monitor blood oxygen saturation will reduce the need for respiratory rate monitoring	35 (18.1)	58 (30.1)	47 (24.4)	30 (15.5)	23 (11.9)
	4.	I believe that the breathing rate is in the acceptable range, respectively from 12 to 20 per minute, only if the SpO_2 values are within the normal range	7 (3.6)	25 (13.0)	56 (29.0)	59 (30.6)	46 (23.8)
Comunication	5.	I am confident that I will report worsening of vital signs in a manner that will prompt the nurse on duty or clinician-educator to reevaluate the patient's condition*	1 (0.5)	8 (4.1)	19 (9.8)	71 (36.8)	94 (48.7)
	6.	I will continue to regularly report changes in vital signs to the nurse on duty or clinician-educator if prompt action is not taken*	1 (0.5)	3 (1.6)	20 (10.4)	72 (37.3)	97 (50.3)
Work duties	7.	Monitoring vital signs takes a lot of time	16 (8.3)	61 (31.6)	50 (25.9)	55 (28.5)	11 (5.7)
	8.	Monitoring vital signs is a boring task	65 (33.7)	67 (34.7)	37 (19.2)	16 (8.3)	8 (4.1)
	9.	Complete and accurate monitoring of vital signs is neglected due to limited time	15 (7.8)	44 (22.8)	42 (21.8)	63 (32.6)	29 (15.0)
	10.	I feel burdened trying to complete my patients' vital signs at different monitoring frequencies (i.e. hourly,every 2hours, 4 every hours, etc.)	23 (11.9)	57 (29.5)	64 (33.2)	42 (21.8)	7 (3.6)
Key indicators	11.	SpO2 is a more reliable indicator in recognizing early symptoms of respiratory dysfunction than respiratory rate	2 (1.0)	32 (16.6)	46 (23.8)	77 (39.9)	36 (18.7)
	12.	Arterial blood pressure is often the first parameter that indicates a change in condition when the patient's condition worsens	3 (1.6)	24 (12.4)	39 (20.2)	88 (45.6)	39 (20.2)
	13.	The value of breathing frequency is the least significant sign of deterioration of the patient's condition	52 (26.9)	70 (36.3)	45 (23.3)	19 (9.8)	7 (3.6)
Knowledge	14.	I am able to relate vital sign values to the physiology and pathophysiology of existing diseases*	5 (2.6)	16 (8.3)	66 (34.2)	88 (45.6)	18 (9.3)
	15.	My knowledge in the interpretation of vital signs in order to recognize the clinical deterioration of the patient's condition is limited	14 (7.3)	72 (37.3)	47 (24.4)	50 (25.9)	10 (5.2)
	16.	Nursing students did not interpret vital signs in a timely and correct manner	40 (20.7)	60 (31.1)	57 (29.5)	24 (12.4)	12 (6.2)

*positive statements

completed high school, and only 2.1% completed other schools. Among students with completed vocational secondary education, 64.7% of students attended the educational profile nurse/technician. The largest number of students (42.5%) attended the first year of studies, followed by the second (16.1%), third (18.1%) and fourth (14.5%) year of studies. Almost every seventh student (16.1%) works or has worked in clinical practice before.

The majority of nursing students (88.1%) expressed a positive attitude towards the statement "Electronic vital signs monitoring is a simple way of monitoring (for example, counting the respiratory rate)" (Table 1). More than half of the students "believe that the respiratory rate is within the acceptable range, that is, 12 to 20 per minute, only if SpO_2 values are within the normal range", that SpO_2 is a more reliable indicator in recognizing the early symptoms of respiratory dysfunction than respiratory rate and that arterial blood pressure is often the first parameter that indicates the change of patient's condition when patient's condition has deteriorated. However, the majority of students expressed a positive attitude

Tabela 2. Distribucija studenata zdravstvene nege (N=193) u odnosu na stavove o praćenju vitalnih znakova pacijenata i domene V-skale

Domeni	Negativan stav		Ambivalentan stav		Pozitivan stav	
	N	%	N	%	N	%
Tehnologija	46	23,8	118	61,1	29	15,0
Komunikacija	1	0,5	15	7,8	177	91,7
Radne obaveze	24	12,4	80	41,5	89	46,1
Ključni indikatori	54	28,0	117	60,6	22	11,4
Znanje	24	12,4	79	40,9	90	46,6
Prosečni skor- V skale	12	6,2	132	68,4	49	25,4
Ukupni skor- V skale	6	3,1	171	88,6	16	8,3

stanje pacijenta“ i „Nastaviću sa redovnim izveštavanjem odgovorne medicinske sestre ili nastavnika vežbi o promenama u vitalnim znacima, ukoliko se nisu promptno preduzele mere“.

Analizom stavova studenata prema prosečnom skoru V-skale uočeno je da 68,4% studenata sestrinstva ima ambivalentan stav o praćenju vitalnih znakova pacijenata prema V-skali, a prema ukupnom skoru V-skale 88,6% (tabela 2). U domenu „komunikacija“ većina studenata (91,7%) je imala pozitivan stav o praćenju vitalnih znakova pacijenata. Najveći procenat studenata (približno polovina studenata) u domenu „radne obaveze“ i domenu „znanje“ je, takođe, imao pozitivan stav o praćenju vitalnih znakova pacijenata. Međutim, u domenu „tehnologija“ (61,6%) i domenu „ključni indikatori“ (46,6%) među studentima je bio najzastupljeniji ambivalentan stav o praćenju vitalnih znakova pacijenata.

Analiza stavova studenata o praćenju vitalnih znakova pacijenata prema V-skali u odnosu na pol prikazana je na tabeli 3. Između studenata i studentkinja dobijena je jedino značajna razlika ($p=0,012$, $t_{(191)}=-2,548$) u stavu o praćenju vitalnih znakova pacijenata u domenu „komunikacija“. Vrednost prosečnog skora u ovom domenu bila je značajno niža za muškarce nego za žene. Uticaj pola na stav studenata o praćenju vitalnih znakova pacijenata u domenu „komunikacija“ bio je mali (*Cohen's d* =-0,49).

U stavu studenta o praćenju vitalnih znakova pacijenata u odnosu na prethodno završenu srednju školu značajna razlika ($p=0,027$, $t_{(191)}=2,223$) je postojala samo u domenu „znanje“ (tabela 4). Vrednost prosečnog skora u domenu „znanje“ je bila značajno viša među studentima koji su prethodno završili stručnu (sredenju medicinsku školu) u odnosu na studente koji su prethodno završili gimnaziju ili neku drugu školu.

U domenu „komunikacija“ ($p=0,05$, $F_{(3,189)}=2,595$) i u domenu „znanje“ ($p=0,002$, $F_{(3,189)}=4,961$) je postojala značajna razlika u stavu studenata o praćenju vitalnih znakova pacijenata u odnosu na godinu studija koju studenti pohađaju (tabela 5). Naknad-

Tabela 3. Prosečni skorovi domena V-skale i ukupni skor V-skale u odnosu na pol ispitanika

Domeni	Muškarci (n = 33)		Žene (n = 160)				
	SD	x̄	SD	x̄	t	p	*d*
Tehnologija	2,77	0,74	2,71	0,71	0,374	ns	--
Komunikacija	4,04	0,75	4,37	0,67	-2,548	0,012	- 0,49
Radne obaveze	3,36	0,79	3,21	0,69	1,085	ns	--
Ključni indikatori	2,95	0,58	2,79	0,63	1,378	ns	--
Znanje	3,32	0,66	3,39	0,78	-0,470	ns	--
Ukupni skor- V skale	51,39	6,45	50,98	6,56	0,330	ns	--

x̄ - srednja vrednost; SD - standardna devijacija; p vrednost za t test; ns (*non significant*) - razlika nije statistički značajna

Table 2. Distribution of nursing students in relation to attitudes about monitoring patients' vital signs (V- scale and domains)

Domains	Negative attitude		Ambivalent attitude		Positive attitude	
	N	%	N	%	N	%
Technology	46	23.8	118	61.1	29	15.0
Communication	1	0.5	15	7.8	177	91.7
Workload	24	12.4	80	41.5	89	46.1
Key indicators	54	28.0	117	60.6	22	11.4
Knowledge	24	12.4	79	40.9	90	46.6
Average score- V-scale	12	6.2	132	68.4	49	25.4
Total score – V-scale	6	3.1	171	88.6	16	8.3

towards the statements "I am sure that I will report worsening of vital signs in a way that will make the nurse on duty or the clinician-teacher to reevaluate the patient's condition" and "I will continue to report regularly to the nurse on duty or the clinician-teacher about the changes in vital signs, if measures were not promptly taken".

By analyzing students' attitudes according to the average score of V-scale, it was observed that 68.4% of nursing students had an ambivalent attitude towards vital signs monitoring according to V-scale, and according to the total score of V-scale 88.6% (Table 2). In the domain of communication, the majority of students (91.7%) had a positive attitude towards vital signs monitoring. The largest percentage of students (approximately half of them) in the domains of work duties and knowledge also had a positive attitude towards vital signs monitoring. However, in the domains of technology (61.6%) and key indicators (46.6%), the ambivalent attitude towards vital signs monitoring was most present among nursing students.

The analysis of students' attitudes towards vital signs monitoring according to the V-scale in relation to gender is shown in Table 3. The significant difference was observed between female and male students (p=0.012, $t_{(191)}$=-2.548) in the attitude towards vital signs monitoring in the domain of communication. The value of the average score in this domain was significantly lower in men than in women. The influence of gender on students' attitudes towards vital signs monitoring in the domain of communication was small (Cohen's d=-0.49).

There was a significant difference (p=0.027, $t_{(191)}$=2.223) in the students' attitude towards vital signs monitoring only in the domain of knowledge (Table 4) in relation to the previously completed high school. The value of the average score in the domain of knowledge was significantly higher among students who had previously completed vocational (medical high school) than among students who had previously completed grammar school or some other school.

Table 3. The total score of the V-scale and the average scores of its domains: differences in relation to gender

Domain	Males (n = 33)		Females (n = 160)				
	SD	x̄	SD	x̄	t	p	*d*
Technology	2.77	0.74	2.71	0.71	0.374	ns	--
Communication	4.04	0.75	4.37	0.67	-2.548	0.012	- 0.49
Workload	3.36	0.79	3.21	0.69	1.085	ns	--
Key indicators	2.95	0.58	2.79	0.63	1.378	ns	--
Knowledge	3.32	0.66	3.39	0.78	-0.470	ns	--
Ukupni skor- V skale	51.39	6.45	50.98	6.56	0.330	ns	--

x̄ - mean; SD –standard deviation; p - for the value of the t test; ns - non significant

Tabela 4. Prosečni skorovi domena V-skale i ukupni skor V-skale u odnosu na prethodno završeno obrazovanje ispitanika

Domeni	Medicinska škola (n = 150)		Gimnazija ili druga škola (n = 43)				
	SD	x̄	SD	x̄	t	p	*d*
Tehnologija	2,74	0,71	2,67	0,73	0,497	ns	--
Komunikacija	4,33	0,66	4,27	0,81	0,402	ns	--
Radne obaveze	3,24	0,71	3,23	0,69	0,081	ns	--
Ključni indikatori	2,84	0,61	2,73	0,68	1,010	ns	--
Znanje	3,44	0,72	3,13	0,86	2,223	0,027	0,40
Ukupni skor- V skale	51,41	6,38	49,81	6,94	1,397	ns	--

x̄ - srednja vrednost; SD - standardna devijacija; p vrednost za t test; ns (*non significant*) - razlika nije statistički značajna

na poređenja pomoću LSD (*post hoc*) testa pokazuju da se prosečni skor na skali stavova studenata I godine studija zdravstvene nege o praćenju vitalnih znakova pacijenata u domenu „komunikacija“ značajno razlikuje (p=0,034) od prosečnog skora studenata II godine studija, kao i (p=0,019) od prosečnog skora studenata IV godine studija. Naknadna poređenja razlika u stavovima studenta zdravstvene nege o praćenju vitalnih znakova pacijenata u odnosu na godinu studija, koja su takođe izvršena pomoću LSD (*post hoc*) testa, pokazuju da su prosečni skorovi u domenu „znanje“ studenata II godine studija (p=0,021) i studenata III godine (p=0,024) studija značajno viši od prosečnog skora studenata IV godine studija.

Diskusija

Stav većine studenata u našoj studiji o praćenju vitalnih znakova pacijenata Integrisanih akademskih studija zdravstvene nege i Osnovnih strukovnih studija zdravstvene nege na Medicinskom fakultetu Novi Sad Univerziteta u Novom Sadu može se protumačiti kao ambivalentni, što pokazuje rezultat na V-skali. Navedeni rezultat je alarmantan, jer je praćenje vitalnih znakova pacijenata fundamentalni aspekt zdravstvene nege, a takođe studenti zdravstvene nege su konstantno izloženi nastavnim sadržajima u vezi sa praćenjem vitalnih znakova pacijenata. Vitalni znaci su osnovni deo procene zdravstvenog stanja pacijenta i krucijalni su za uočavanje pogoršanja zdravstvenog stanja pacijenta (10). U studiji *Alshehry* i sar. (4) sprovedenoj u Saudijskoj Arabiji među 529 studenata zdravstvene nege ukupan skor V-skale je 2,95 i ukazuje da je stav studenata o praćenju vitalnih znakova pacijenata ambivalentan, što je slično rezultatima našeg istraživanja. Studenti sestrinstva tokom studiranja ne treba da steknu samo znanja i veštine za praćenje vitalnih znakova, već treba da razviju pozitivne stavove o praćenju vitalnih

Tabela 5. Prosečni skorovi domena V-skale i ukupni skor V-skale u odnosu na prethodno završeno obrazovanje ispitanika

Domeni	I godina (n = 82)		II godina (n = 48)		III godina (n = 35)		IV godina (n = 28)				
	SD	x̄	SD	x̄	SD	x̄	SD	x̄	*F*	*p*	η^2
Tehnologija	2,79	0,70	2,66	0,81	2,79	0,61	2,56	0,70			
Komunikacija	4,18	0,76	4,45	0,56	4,30	0,73	4,53	0,56	2,595	0,05	0,04
Radne obaveze	3,16	0,77	3,34	0,67	3,21	0,60	3,28	0,71	0,727	ns	--
Ključni indikatori	2,90	0,60	2,64	0,63	2,88	0,53	2,77	0,74	1,838	ns	--
Znanje	3,18	0,79	3,69	0,67	3,39	0,79	3,42	0,58	4,961	0,002	0,07
Ukupni skor- V skale	50,39	6,67	51,92	5,91	51,43	6,73	51,03	6,53	0,858	ns	--

x̄ - srednja vrednost; SD - standardna devijacija; p vrednost za t test; ns (*non significant*) - razlika nije statistički značajna

Table 4. The total score of the V scale and the average scores of its domains: differences in relation to previously completed education

Domains	Medical school (n = 150)		Grammar school or other school (n = 43)				
	SD	x̄	SD	x̄	t	p	*d*
Technology	2,74	0,71	2,67	0,73	0,497	ns	--
Communication	4,33	0,66	4,27	0,81	0,402	ns	--
Workload	3,24	0,71	3,23	0,69	0,081	ns	--
Key indicators	2,84	0,61	2,73	0,68	1,010	ns	--
Knowledge	3,44	0,72	3,13	0,86	2,223	0,027	0,40
Total score – V scale	51,41	6,38	49,81	6,94	1,397	ns	--

x̄ - mean; SD - standard devijation; p value for the t test; ns - non significant

There was a significant difference in the students' attitude towards vital signs monitoring in relation to the year of studies in the domains of communication (p=0.05, $F_{(3.189)}$=2.595) and knowledge (p=0.002, $F_{(3.189)}$=4.961) (Table 5). Subsequent comparisons using the LSD (post hoc) test show that the average score on the scale of attitudes of first-year students towards vital signs monitoring in the domain of communication is significantly different (p=0.034) from the average score of second-year students, as well as (p=0.019) from the average score of fourth-year students. The subsequent comparisons of differences in attitudes of nursing students towards vital signs monitoring in relation to the year of studies, which were also carried out with the help of LSD (post hoc) test, show that the average scores in the domain of knowledge among second-year students (p=0.021) and third-year students (p=0.024) are significantly higher than the average score of fourth-year students.

Discussion

The attitude of the majority of students of the Integrated Academic Studies in Nursing and Undergraduate Applied Studies in Nursing at the Faculty of Medicine in Novi Sad, University of Novi Sad towards vital signs monitoring in our study may be interpreted as ambivalent, as shown by the result on the V-scale. The above mentioned result is alarming, because monitoring patients' vital signs is a fundamental aspect of health care, and also because nursing students are constantly exposed to contents related to vital signs monitoring. Vital signs are a basic part of the evaluation of patient's health condition, and they are crucial for noticing the deterioration of patient's health condition (10). In the study

Table 5. The total score of the V scale and the average scores of its domains: differences in relation to the year of study

Domains	I year (n = 82)		II year (n = 48)		III year (n = 35)		IV year (n = 28)				
	SD	x̄	SD	x̄	SD	x̄	SD	x̄	*F*	*p*	η^2
Technology	2.79	0.70	2.66	0.81	2.79	0.61	2.56	0.70			
Communication	4.18	0.76	4.45	0.56	4.30	0.73	4.53	0.56	2.595	0.05	0.04
Workload	3.16	0.77	3.34	0.67	3.21	0.60	3.28	0.71	0.727	ns	--
Key indicators	2.90	0.60	2.64	0.63	2.88	0.53	2.77	0.74	1.838	ns	--
Knowledge	3.18	0.79	3.69	0.67	3.39	0.79	3.42	0.58	4.961	0.002	0.07
Total score – V scale	50.39	6.67	51.92	5.91	51.43	6.73	51.03	6.53	0.858	ns	--

x̄ - mean; SD - standard devijation; p value for the t test; ns - non significant

znakova pacijenta. Kao što se sugeriše u literaturi, stavovi studenata prema praćenju vitalnih znakova pacijenata su ključna komponenta u promovisanju budućeg ponašanja (11).

U našem istraživanju većina studenata zdravstvene nege imala je pozitivan stav prema tvrdnjama o praćenju vitalnih znakova pacijenata u domenu „komunikacija". U skladu sa našim rezultatima su i rezultati *Alshehry* i sar. (4) sprovedeni u Saudijskoj Arabiji među studentima zdravstvene nege i *Mok* i sar. (9) sprovedeni u Singapuru među medicinskim sestrama, gde su ispitanici iskazali pozitivan stav prema tvrdnjama u domenu „komunikacija". Studija *Gawronski* i sar. (12) sprovedena u deset bolnica u Italiji, takođe ukazuje na pozitivan stav pedijatrijskih medicinskih sestara prema komunikaciji. Komunikacija je bitan element u svim oblastima sestrinstva, uključujući prevenciju, lečenje, rehabilitaciju, obrazovanje i promociju zdravlja, a neki autori je smatraju srcem zdravstvene nege (13). Veština kliničke komunikacije se definiše kao komunikacija medicinskog radnika sa pacijentima, članovima njihovih porodica i drugim članovima medicinskog tima (14). Ukoliko medicinske sestre žele da pruže kvalitetnu zdravstvenu negu moraju da poseduju dobre komunikacione veštine, kako bi na adekvatan način komunicirale sa pacijentima i njihovom porodicom, lekarima, drugim medicinskim sestrama i ostalim članovima medicinskog tima (15). *Xie* i sar. (14) su sproveli studiju koja ukazuje da većina medicinskih grešaka nije posledica nedostatka tehnologije ili nemara zdravstvenih radnika, nego da je povezana sa neefikasnom komunikacijom. S obzirom na sve prethodno navedeno, sticanje stručnih kompentecija komunikacije kod studenata zdravstvene nege treba da bude jedna od osnovnih kompetencija koje će usvojiti tokom školovanja. Ta izuzetno dinamična, kontinuirana i značajna aktivnost neophodna je radi obezbeđivanja kvaliteta i kontinuiteta u nezi. Komunikacija u sestrinstvu ima profesionalni karakter i treba da bude stručno prepoznatljiva, posebno za mlade medicinske sestre i studente sestrinstva zbog nedostatka iskustva. Komunikacija se uči i uvežbava tokom stručne prakse i ta vrsta učenja nikada se ne može smatrati dovršenom (16).

Naše istraživanje pokazuje da je u domenu „znanje" najveći procenat studenata zdravstvene nege imao pozitivan stav o praćenju vitalnih znakova pacijenata. Rezultati studije koju su sproveli *Alshehry* i sar. (4) ukazuju da se skoro polovina studenata slaže da im je znanje u interpretaciji vitalnih znakova u cilju prepoznavanja kliničkog pogoršavanja stanja pacijenata ograničeno, a četvrtina se slaže da studenti sestrinstva nisu pravovremeno i pravilno interpretirali vitalne znake (4). Istraživanje koje su sproveli *Leonard* i *Kyriacos* (5) u Južnoj Africi, pokazuje da studenti završne godine sestrinstva imaju poteškoća u prepoznavanju ranih znakova pogoršanja stanja pacijenta, koje mogu predvideti pomoću abnormalnih vitalnih znakova pacijenata. Istraživači ističu da sva saznanja dobijena istraživanjima u vezi sa ranim znakovima pogoršanja zdravstvenog stanja pacijenata moraju da budu inkorporirana u nastavne sadržaje pre nego što studenti počnu da pohađaju kliničku praktičnu nastavu (5).

Pored toga, studija sprovedena u Velikoj Britaniji ukazuje da većina bolnica koje pripadaju Nacionalnom zdravstvenom sistemu (engl. *National Health Service*, NHS) sada koristi rano upozoravajući skor za praćenje pacijenta (engl. *Early Warning Score*, EWS), kao i da zdravstveni radnici ponekad izražavaju zabrinutost i pokazuju nepoverenje prema rezultatima EWS i načina na koji treba reagovati (17). Istraživanje sprovedeno u Južnoj Africi beleži da je 44% ispitanih medicinskih sestara pogrešno identifikovalo abnormalnosti vitalnih znakova, što može negativno da utiče na prepoznavanje ranih znakova pogoršanja stanja pacijenta (18). *Padilla* i *Mayo* (19) ukazuju da je prepreka u detektovanju i reagovanju na kliničko pogoršanje posledica nepostojanja jedinstvenog koncepta kliničkog pogoršanja stanja pacijenta i razlika u praksi, što stvara jaz u znanju. Razjašnjenje ovog koncepta je vitalno za sestrinsku praksu i istraživanje (19). Prethodno navedeni rezultati upućuju na potrebu za jedinstvenim i kontinuiranim obrazovanjem tokom studiranja, a u vezi sa praćenjem i merenjem vitalnih znakova pacijenata u cilju ranog, pravovremenog detektovanja kliničkog pogoršanja stanja pacijenta (4). Međutim, formalno obrazovanje ne može da pruži sva potrebna znanja za praksu. S obzirom da stečeni nivo znanja čini osnovu za dalje permanentno usavršavanje, prelazak sa obaveznog školovanja na obavezno učenje i na sve veće i šire intelektualizovanje profesije i rada je imperativ za lični razvoj, razvoj prakse i profesije (16).

Više od polovine saudijskih studenata slaže se sa tvrdnjama da je elektronsko praćenje vitalnih znakova jednostavniji način praćenja (npr. bro-

of Alshehry et al. (4), which was conducted in Saudi Arabia among 529 medical students, the total score of V-scale was 2.95 and it pointed to the ambivalent attitude of students towards vital signs monitoring, which is similar to the results of our study. During their studies, nursing students should not only acquire the knowledge and skills necessary for vital signs monitoring, but should also develop positive attitudes towards vital signs monitoring. As suggested in the literature, students' attitudes towards vital signs monitoring are a key component in promoting future behavior (11).

In our study, the majority of nursing students had a positive attitude towards the statements about vital signs monitoring in the domain of communication. The results of the study of Alshehry et al. (4), which was conducted in Saudi Arabia among nursing students, as well as the study of Mok et al. (9), which was conducted in Singapore among nurses, where participants expressed a positive attitude towards statements in the domain of communication, are in accordance with the results of our study. The study of Gawronski et al. (12), which was conducted in ten hospitals in Italy, also pointed to the positive attitude of pediatric nurses towards communication. Communication is an important element in all fields of nursing, including prevention, treatment, rehabilitation, education and health promotion, while some authors consider it to be the heart of health care (13). The skill of clinical communication is defined as the communication between medical professionals and patients, members of their families and other members of the medical team (14). If nurses want to provide quality health care, they must have good communication skills in order to communicate in an adequate way with patients and their families, doctors, other nurses and other members of the medical team (15). Xie at el. (14) conducted a study, which shows that the majority of medical errors are not caused by the lack of technology or negligence of healthcare workers, but are related to inefficient communication. Considering all of the above mentioned, the acquisition of professional communication competences by healthcare students should be one of the basic competences that they will acquire during their studies. This extremely dynamic, continuous and significant activity is necessary to ensure quality and continuity in care. Communication in nursing has a professional character and should be professionally recognizable especially for young nurses and nursing students due to their lack of experience. Communication is learned and practiced during professional practice and that kind of learning can never be considered complete (16).

Our study shows that the largest percentage of nursing students has a positive attitude towards vital signs monitoring in the domain of knowledge. The results of the study conducted by Alshehry et al. (4) indicate that almost half of the students agree that their knowledge in the interpretation of vital signs aimed at recognizing the clinical deterioration of patient's condition is limited, and a quarter of them agree that nursing students did not interpret vital signs in a timely and correct manner (4). A study conducted by Leonard and Kyriacos (5) in South Africa shows that final year nursing students have difficulty in recognizing the early signs of deterioration of patient's condition, which can be predicted by abnormal vital signs. The researchers indicate that all findings obtained from the research on the early signs of deterioration of patient's condition must be incorporated into the curriculum before students start attending practical clinical training (5).

In addition, a study conducted in Great Britain indicates that the majority of hospitals that belong to the National Health Service (NHS) used the early warning score (EWS) to monitor their patients, as well as that the healthcare workers sometimes expressed concerns and distrusted the EWS results and the ways in which one should react (17). A study conducted in South Africa found that 44% of nurses misidentified the abnormalities of vital signs, which can negatively affect the recognition of early signs of deterioration of patient's condition (18). Padilla and Mayo (19) indicate that there is an obstacle in detecting and responding to clinical deterioration due to the lack of a single concept of clinical deterioration and differences in practice, which creates a gap in knowledge. The clarification of this concept is vital for nursing practice and research, as well (19). The aforementioned results point to the need for the unique and continuous education during studies related to the monitoring and measuring of patients' vital signs, aimed at the early and timely detecting of clinical deterioration of patients' condition (4). However, formal education cannot provide all the necessary knowledge important for practice. Given that the

janje) frekvencije disanja i da je frekvencija disanja u prihvatljivom opsegu, odnosno od 12 do 20 u minuti, samo ukoliko su vrednosti SpO_2 unutar normalnog opsega, što je u skladu sa rezultatima dobijenim u našem radu (5). Slične rezultate našim rezultatima imali su *Gawronsk* i sar. za tvrdnje u domenu Tehnologija (12). Nasuprot tome, medicinske sestre u studiji *Mok* i sar. (9), pokazale su pozitivnije stavove prema tvrdnjama u ovom domenu V-skale.

Prethodno navedeni rezultati ukazuju na nedostatak potrebnog znanja i ispravnog stava kod studenata u vezi sa važnošću adekvatne procene frekvencije disanja i adekvatne upotrebe tehnologije (npr. pulsnog oksimetra) u proceni vitalnih znakova pacijenata. Sa ovakvim tvrdnjama koreliraju podaci u preglednom radu *Mok* i sar. (20), koji pokazuju da, iako se zna da je frekvencija disanja važan prediktor ranog pogoršanja zdravstvenog stanja pacijenta, medicinske sestre neretko propuste da je procene. Šta više, frekvencija disanja je najređe beležen vitalni znak u medicinskoj dokumentaciji pacijenata (20). Takođe, frekvencija disanja je najpotcenjeniji vitalni znak (21). U nekoliko studija autori su pokušali da obrazlože zašto medicinske sestre zanemaruju procenu frekvencije disanja pacijenata. Tako studija *Ansell* i sar. (8) pokazuju da su propuštene procene frekvencije disanja od strane medicinskih sestara posledica njihovog stava da je praćenja frekvencije disanja nešto što oduzima vreme, prekida medicinske sestre tokom procene, i malo im se pridaje važnost. Rezultati studije *Philip* i sar. (22) ukazuju da su nemarnost i nizak nivo obrazovanja razlozi zbog kojih medicinske sestre zanemaruju praćenja frekvencije disanja kod pacijenata.

Literaturni podaci, takođe, sugerišu da preveliko oslanjanje studenata na tehnologiju pri proceni vitalnih znakova može dovesti do neadekvatne procene pacijentovog stanja zbog izostanka procene disanja. *Mok* i sar. (20) u preglednom radu su sugerisali da je upotreba pulsne oksimetrije verovatan uzrok lošeg praćenja frekvencije disanja, jer ga neke medicinske sestre mogu smatrati zamenom za praćenje vitalnog znaka disanja. Slično tome, *Flenady* i sar. (23) navode da medicinske sestre neretko ne procenjuju frekvenciju disanja pacijenta kada procenjuju ostale vitalne znake. Iako upotreba elektronskog monitoringa vitalnih znakova jeste predložena u cilju efikasnije detekcije fizioloških znakova pogoršanja kliničke slike pacijenta, ova strategija ima nekoliko ograničenja, uključujući smanjenu zastupljenost fizičke interakcije medicinskih sestara sa pacijentima, što smanjuje mogućnost da medicinske sestre direktno primete rane znakove pogoršanja kliničke slike pacijenta i zanemare procenu disanja kada ona nije uključena u elektronski nadzor (20).

Više od polovine studenata u našoj studiji iskazalo je ambivalentan stav prema tvrdnjama iz domena „ključni indikatori“ i „tehnologija“, što ukazuje da studenti možda nemaju adekvatnu sposobnost da prepoznaju glavne indikatore pogoršanja i smatraju da im je praćenje vitalnih znakova dodatna obaveza na njihov obim posla. Do sličnih zaključaka došli su *Mok* i sar. (9) u studiji sprovedenoj među sestrama i *Alshehry* i sar. (4) u studiji sprovedenoj među studentima zdravstvene nege.

Slično rezultatima našeg istraživanja, rezultati studije *Alshehry* i sar. (4) i *Mok* i sar. (9) sprovedenim među medicinskim sestrama ukazuju da više od polovine (57,5% i 56,9%, respektivno) ispitanika smatra promene u arterijskom krvnom pritisku prvim parametrom pogoršanja stanja pacijenta. Pregledni rad *Brekke* i sar. (24) ukazuje da je frekvencija disanja, a ne visina krvnog pritiska ili nivo saturacije krvi kiseonikom, najprecizniji prediktor pogoršanja stanja pacijenta. Arterijski krvni pritisak definiše se kao kasni indikator pogoršanja, a ne kao rani znak kliničkog pogoršanja stanja pacijenta (25). Prethodno navedene zablude u vezi sa ključnim indikatorima kliničkog pogoršanja stanja pacijenta naglašavaju da je znanje iz ove oblasti potrebno dovesti na viši nivo.

Skoro polovina studenata u našoj studiji izrazila je pozitivan stav prema tvrdnjama o praćenju vitalnih znakova pacijenata u domenu „radne obaveze“. Četvrtina studenata smatra da su preopterećeni pokušavajući da završe prikupljanje vitalnih znakova svojih pacijenata u različitoj učestalosti praćenja (na sat vremena, na 2 sata, na 4 sata, itd.), dok se približno polovina studenata slaže da je potpuno i tačno praćenje vitalnih znakova zanemareno zbog ograničenog vremena pri praćenju. Međutim, studenti sestrinstva u Saudijskoj Arabiji izrazili su ambivalentan stav prema ovom domenu u V-skali. Ista studija pokazuje da čak polovina studenata smatra da su preopterećeni ukoliko prate vitalne znake pacijenata u različitim vremenskim intervalima (4). Ranije studije identifikovale su opterećenje obimom posla kao kritični faktor koji utiče na kvalitet praćenja vitalnih znakova pacijenata od

acquired level of knowledge makes only the basis for further continuous education, the transition from compulsory education to compulsory learning and wider profession and work is an imperative for the personal development, as well as for the development of profession and practice (16).

More than a half of students from Saudi Arabia agree with the statement that electronic monitoring of vital signs is a simpler way of monitoring (e.g. counting) the respiratory rate and that the respiratory rate is within the acceptable range , that is 12 to 20 per minute, only if the values of SpO_2 are within the normal range, which is consistent with the results of our study (5). The results of Gawronsk et al. were similar to the results of our study regarding the statements in the domain of Technologies (12). On the contrary, nurses in the study of Mok et al. (9) showed more positive attitudes towards these statements in this domain of V-scale.

The aforementioned results point to the lack of necessary knowledge and correct attitude among students regarding the importance of adequate estimation of respiratory rate and adequate use of technology (e.g. a pulse oximeter) in the assessment of patients' vital signs. Data from the review article of Mok et al. (20) correlate with these claims, which show that, although it is known that the respiratory rate is an important predictor of the early deterioration of patient's condition, nurses often fail to assess it. Moreover, the respiratory rate is the most rarely recorded vital sign in patients' medical history (20). Also, the respiratory rate is the most underestimated vital sign (21). In several studies, the authors tried to explain why nurses fail to assess patients' respiratory rates. Also, the study of Ansell et al. (8) shows that missed assessments of respiratory rate is the result of nurses' attitude that monitoring the respiratory rate is time-consuming, interrupts nurses during the assessment and is given little importance. The results of the study by Philip et al. (22) show that the carelessness and low level of education are the reasons why nurses neglect to monitor the respiratory rate in patients.

The literature data also suggest that students' excessive reliance on technology when assessing vital signs can lead to the inadequate assessment of patient's condition due to the absence of respiratory assessment. Mok et al. (20) in a review article suggested that the use of pulse oximetry may be the possible cause of poor monitoring of respiratory rate, because some nurses may consider it to be the replacement for monitoring the vital sign of breathing. Similarly, Flenady et al. (23) state that nurses often do not assess the patient's respiratory rate when assessing other vital signs. Although the use of electronic monitoring of vital signs has been proposed with the aim of detecting more efficiently the physiological signs of deterioration of patient's condition, this strategy has a few limitations, including the reduced physical interaction between nurses and patients, which reduces the possibility that nurses directly notice the early signs of deterioration of patient's clinical condition and neglect the assessment of breathing when it is not included in electronic monitoring (20).

More than half of the students in our study expressed an ambivalent attitude towards the claims from the domains of key indicators and technologies, which indicates that students may not have the adequate ability to recognize the main indicators of worsening and consider the vital signs monitoring to be the extra workload. Similar conclusions were reached by Mok et al. (4) in a study conducted among nursing students.

Similar to the results of our research, the results of the studies of Alshehry et al. (4) and Mok et al. (9) conducted among nurses indicate that more than half (57.5% and 56.9%, respectively) of the respondents consider the change in arterial blood pressure to be the first parameter of the deterioration of patient's condition. A review article of Brekke and associates (24) indicates that the respiratory rate is the most accurate indicator if the clinical deterioration of patient's condition, and not blood pressure or blood oxygen saturation level. Arterial blood pressure is defined as the late indicator of deterioration, and not as an early sign of clinical deterioration of patient's condition (25). The above mentioned misconceptions related to the key indicators of clinical deterioration of patient's condition emphasize that the knowledge in this field should necessarily be brought to a higher level.

Almost half of the students in our study expressed a positive attitude towards the statements about vital signs monitoring in the domain of work duties. One fourth of students claimed they were burdened trying to complete the collection of vital signs of all patients at different monitoring frequencies (hourly, every

strane medicinskih sestara (20). Učestalost praćenja vitalnih znakova treba da bude određena na osnovu pristupa nezi usredsređenoj na pacijenta (26).

Hogan (27) kao i *Mok* i sar. (20) ukazuju da preopterećenje poslom medicinskih sestara utiče na kvalitet njihovog praćenja vitalnih znakova pacijenata. Navedeni rezultat studija koje su sproveli *Hogan* (27) i *Mok* i sar. (20) može da se odnosi i na studente. Studenti možda vide praćenje vitalnih znakova kao dodatno opterećenje povrh drugih zahteva koje moraju da ispune, a koji su im dodeljeni u kliničkoj praksi. Pored svih zahteva i obaveza tokom kliničkih vežbi, studenti se susreću i sa psihološkim i emotivnim opterećenjima (npr. stres, anksioznost).

U našoj studiji, indetifikovano je nekoliko faktora u predviđanju studentskog stava prema praćenju vitalnih znakova pacijenata. Različiti stavovi dobijeni su kada su studenti grupisani prema polu, godini studija, prethodno završenom školom i u odnosu, da li imaju kliničkog iskustva.

Rezultat našeg istraživanja pokazuje da je značajna razlika u stavu studenta o praćenju vitalnih znakova pacijenata između muškaraca i žena postojala samo u domenu „komunikacija“. Vrednost prosečnog skora u domenu „komunikacija“ je bila značajno niža među muškarcima nego među ženama. Saglasno našim rezultatima, rezultati studije *Alshehry* i sar. (4) sprovedene među studentima zdravstvene nege u Saudijskoj Arabiji ukazuju da muškarci imaju negativniji stav prema domenu „komunikacija“ u odnosu na žene. Istraživanje *Alshehry* i sar. (4) takođe pokazuje da postoji značajna razlika u stavovima studenata zdravstvene nege u odnosu na pol i u domenima „ključni indikatori“ i „tehnologija“, pri čemu muškarci imaju pozitivniji stav nego žene.

Naše istraživanje ukazuje da je samo u domenu „znanje“ postojala značajna razlika u stavovima studenata o praćenju vitalnih znakova pacijenata u odnosu na prethodno završenu srednju školu. Studenti koji su završili stručnu srednju (medicinsku) školu imali su značajno više vrednosti prosečnog skora u domenu „znanje“ nego studenti koji su prethodno završili gimnaziju ili neku drugu školu. Studenti koji su završili srednju medicinsku školu su o vitalnim znacima pacijenata upoznati od samog početka srednjoškolskog obrazovanja, odnosno od prvog razreda srednje škole, u okviru nastavnog gradiva koje je obrađivano na stručnim nastavnim predmetima tokom njihovog školovanja. Stručne kompentencije za praćenje i merenje vitalnih znakova stiču u drugom razredu srednje medicinske škole u okviru nastavnog predmeta „zdravstvena nega“ (na teorijskoj nastavi: znanja o vitalnim znacima; na praktičnoj nastavi započinje se sticanje veština).

Dobijeni rezultati istraživanja pored naučnog, imaju i stručni značaj, jer se na osnovu njih mogu kreirati pedagoške implikacije, kao osnova za unapređenje postojećih nastavnih sadržaja kliničkih vežbi na studijama zdravstvene nege.

Zaključak

U cilju poboljšanja stava studenata zdravstvene nege prema praćenju vitalnih znakova pacijenta, neophodno je kontinuirano sticanje praktičnih i teorijskih znanja u vezi sa praćenjem vitalnih znakova pacijenta zarad detektovanja kliničkog pogoršanja zdravstvenog stanja pacijenta. Takođe, neophodno je inkorporirati u nastavni plan sadržaje vezane za pravilnu upotrebu tehnologije u praćenju vitalnih znakova pacijenata i razvijati svest kod studenata zdravstvene nege za potrebom celoživotnog učenja, intelektualizovana profesije i rada.

Konflikt interesa

Autori su izjavili da nema konflikta interesa.

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2 hours, every 4 hours, etc.), while half of the students agreed that accurate and complete vital signs monitoring was neglected due to the limited time. However, nursing students in Saudi Arabia expressed an ambivalent attitude towards this domain on the V-scale. The same study showed that half of the students considered themselves to be overloaded if they monitored vital signs at different time intervals (4). Earlier studies identified the work overload as the critical factor that influences vital signs monitoring performed by nurses (20). The frequency of vital signs monitoring should be determined based on the approach to patient-centered care (26).

Hogan (27), as well as Mok and associates (20) point to the fact that the work overload of nurses affects the quality of vital signs monitoring. The above mentioned result of studies carried out by Hogan (27) and Mok et al. (20) may also refer to students. Students may see vital signs monitoring as an additional burden in addition to other tasks that have to be fulfilled, and which have been assigned to them in clinical practice. In addition to all requirements and obligations during clinical training, students also encounter the psychological and emotional burdens (e.g. stress, anxiety).

In our study, several factors were identified in predicting students' attitudes towards vital signs monitoring. Different attitudes were obtained when students were grouped according to gender, year of studies, previously completed school, and whether they had clinical experience.

The results of our study show that there is a significant difference between male and female students regarding their attitude towards vital signs monitoring, but only in the domain of communication, The value of average score in the domain of communication was significantly lower in men than in women. In accordance with the results of our study, the results of the study of Alshehry et al. (4) conducted among nursing students in Saudi Arabia show that men have a more negative attitude towards the domain of communication than women. The study of Alshehry (4) also shows that there is a significant difference in attitudes of nursing students in relation to their gender in the domains of Key Indicators and Technology, with men having more positive attitudes than women.

Our study indicates that only in the domain of Knowledge, there is a significant difference in the students' attitudes to vital signs monitoring in relation to the previously completed secondary school. Students who had graduated from vocational secondary (medical) schools had significantly higher values of average score in domain of knowledge than students who had previously graduated from high school or some other school. Students who graduated from secondary medical schools were familiar with patents' vital signs from the very beginning of secondary education, that is, from the first grade of secondary school, within the curriculum, which was covered as part of medical school classes during their secondary education. Professional competences for monitoring and measuring vital signs are acquired in the second year of secondary medical school within the curriculum of the subject Health Care (theoretical part of the course: knowledge about vital signs; practical part of the course: the acquisition of skills).

The obtained results of our study, apart from the scientific, have the professional significance, because pedagogical implications can be based on them, as a basis for the improvement of curriculum of practical clinical training within the nursing studies.

Conclusion

In order to improve the attitude of nursing students towards vital signs monitoring, it is necessary to continuously acquire practical and theoretical knowledge related to vital signs monitoring, so that the clinical deterioration of patient's health condition could be detected. Also, it is necessary to incorporate the contents related to the proper use of technology in vital signs monitoring into the Curriculum, and to develop the awareness among nursing students of the need for lifelong education, intellectualization of profession and work.

Competing interests

The authors declared no competing interests.

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