

Self-Reported Confidence, Attitudes and Skills in Practical Procedures among Medical Students: Questionnaire Study

Vlatka Tomić¹, Goran Sporiš², Dinko Nizić¹ and Ivana Galinović³

¹ School of Medicine, University »Josip Juraj Strossmayer«, Osijek, Croatia

² Faculty of Kinesiology, University of Zagreb, Zagreb, Croatia

³ School of Medicine, University of Zagreb, Zagreb, Croatia

ABSTRACT

The aim of our study was to investigate the influence of gender, loss of academic year(s), confidence and attitudes of students on the clinical experience gained by undergraduate education. The survey was conducted during 2004 and 2005 in a sample of 182 students of the 5th and the 6th year at J.J.Strossmayer University School of Medicine in Osijek. The participants were grouped and matched according to their gender, regular studying, the number of time(s) student has performed certain practical medical procedure and the self-confidence arisen by performing one. Furthermore, participants were grouped and compared due to their own assessment of their own practical and theoretical medical knowledge, courses which provide them the least and oppositely – the most practical medical knowledge and their attitude toward current medical faculty curriculum on clinical courses as well as the possibilities of improving them. Fisher's exact test and χ^2 -test were used to estimate statistical differences between the groups and the parameters in research, while coefficient of contingency was introduced with the aim of defining their correlation. The results showed statistically significant differences between male students who performed more practical medical procedures than female ($p < 0.001$), non-repeaters performed medical procedures more often than repeaters ($p < 0.001$, $C = 0.658$) while repeaters thought higher of their theoretical knowledge than non-repeaters ($p < 0.005$). Data analysis showed statistically significant correlation between clinical experience and the level of confidence ($C = 0.944$). This study confirmed influence of male gender, regular studying, better opinion about one's own practical skills and higher confidence in one's own work on greater number of clinical skills performed during undergraduate education.

Key words: *medical students, educational status, practical skills, attitude, confidence, questionnaires*

Introduction

The importance of clinical practice in the medical education of future doctors is widely recognized and cannot be overstated. Clinical rotations are designed to allow students to obtain greater clinical experience through a vast and varied number of patients, while being overseen by an enthusiastic mentor¹. During these rotations, most medical universities require knowledge of basic clinical skills, and their implementation, from their students²⁻⁴.

Research has shown how clinical experience and practice in performing basic clinical skills lead to greater self confidence⁵ and satisfaction amongst students⁶. Besides, a student who had repeatedly performed a certain clinical

task is more likely to keep performing it, which leads to his greater competence^{7,8}.

Despite the fact that young doctors should possess certain medical skills as a result of their undergraduate education, there is evidence to suggest that they are inadequately prepared for the beginning of their clinical practise⁹. Mentors of young doctors working through their internship are of similar opinion¹⁰. One of the reasons is most certainly the lack of clinical experience throughout their education at medical universities¹¹.

Little research attention has been given to quantifying medical procedures and linking them to student's

gender, attitude, level of self-confidence in their own work and loss of academic year(s). Also, we wanted to investigate students' opinion on clinical subjects and exercises.

The aim of the study was to investigate the influence of gender, loss of academic years, self-confidence and attitudes of students on the clinical experience gained by undergraduate education.

Material and Methods

Participants

The study was conducted on 5th and 6th year students at the Medical University of Osijek (n=232) from 14th May to 14th June 2004 and 2005. Ensuring their anonymity, the questionnaire, consisting of 23 questions, was given to students immediately after their lecture. All students attending lectures during this particular one-month period took part in the study, coming to a total of 182 students (response rate of 78.4%).

Data collection

All of the students present at lectures and seminars (n=182) agreed to participate in the study. Of that number, 2 students completed their questionnaires inadequately and were thus excluded from the study. Therefore, the total number of examinees came to 180 (76.6% of all 5th and 6th year students), of which 120 (66.6%) were female and 60 (33.3%) were male (the prevalence of females in the study is linked to the percentage of women at the Medical University of Osijek; data received from the University data base). There were 87 fifth year students, and 93 sixth year students.

The questionnaire

The authors of this study have examined literature^{2,4,8,12} dealing with the practical knowledge and skills taught to, and known by, medical students, young and practicing doctors. Those skills most frequently mentioned and matching the Medical University of Osijek curriculum were considered: taking case histories, performing physical examinations, administering injections, stitching wounds and dressing them, basic life support skills and writing prescriptions. The questionnaire was pre-tested and items with more than 5% of missing values, low discrimination index or simply confusing to participants were excluded from the final version. Internal consistency was satisfying with an alpha 0.953

The questionnaire consisted of 23 questions divided into 3 groups. The first group referred to general student information (gender, year of birth, year of enrollment at Medical University, sabbatical year, and numerically expressed information as to whether the student had failed a year.) The second group consisted of 6 questions covering the student's familiarity with different practical skills and knowledge. For each of the skills, they were asked as to whether they had performed them during their medical education (answers 'yes' and 'no'). If they

had, they were required to write down the number of times the skill had been performed. Participants were also asked to rate the level of self confidence they felt in performing each of these clinical procedures on a scale of 1 to 5 (1= I feel absolute self confidence, 5= I feel absolutely no self confidence). The final group of questions consisted of 5 queries covering the following: the student's subjective assessment of his or her own practical and theoretical knowledge (on a scale of 1 to 5, 1 being inadequate, and 5 being excellent), the clinical subjects which have, in their opinion, most contributed to their acquisition of practical medical knowledge and those that contributed the least (open question), their opinion on the importance of practical medical knowledge and skills (a closed question with the possibility of choosing only one answer), and their assessment of the effectiveness of clinical education (a closed question with the possibility of choosing only one answer).

Statistical methods

Statistical analysis of data was performed using the statistical program Statistics version 6.0 for Windows. The χ^2 test was used to estimate statistical differences between the groups, and the coefficient of contingency, with the aim of defining their correlation. The difference in attitudes towards theoretical and practical medical knowledge of repeaters and regular students was determined by Fisher's exact test. The reliability of the questionnaire was determined by reliability analysis (alpha). A value of $p < 0.05$ was considered statistically significant.

Results

Out of 232 students a total of 182 completed the questionnaire (response rate of 78.4%). Two questionnaires weren't filled out properly and were thus excluded from the study. Results show no difference in gender between regular students and repeaters (Table 1).

The results given by students of finishing years established that skills in practical procedures depend on whether they failed one or more years and that repeating students have a more positive attitude towards their theoretical medical knowledge than regular students (Table 2).

TABLE 1
COMPARISON IN GENDER BETWEEN REPEATERS
AND REGULAR STUDENTS

	Number (%) of students		
	Repeaters	Regular students	Total
Gender			
Male	40 (22.2)	20 (11.1)	60 (33.3)
Female	60 (33.3)	60 (33.3)	120 (66.6)
Total	100 (55.5)	80 (44.4)	180 (100.0)*

* $\chi^2=4.5$, $df=1$, $p=0.033$

TABLE 2
COMPARISON BETWEEN REPEATERS AND REGULAR STUDENTS CONCERNING THEIR SELF-ASSESSMENT TOWARD THEORETICAL AND PRACTICAL MEDICAL KNOWLEDGE

Self-assessment	Theoretical knowledge			Practical knowledge		
	Repeaters	Regular students	p	Repeaters	Regular students	p
Excellent	10 (5.5)	0 (0.0)		4 (2.2)	0 (0.0)	
Very good	30 (16.6)	25 (13.8)		16 (8.8)	3 (1.6)	
Good	34 (18.8)	34 (18.8)	0.021*	34 (18.8)	34 (18.8)	0.032*
Sufficient	19 (10.5)	17 (9.4)		33 (18.7)	24 (13.6)	
Insufficient	8 (4.4)	3 (1.6)		14 (7.7)	18 (10.0)	

*p<0.05 by Fisher's exact test

TABLE 3
CORRELATION BETWEEN PRACTICAL MEDICAL KNOWLEDGE AND THE STUDENTS' SELF-ASSESSMENT OF PRACTICAL MEDICAL KNOWLEDGE

	Case histories and physical examinations	Number of administered injections	Number of dressed wounds	Number of sutured wounds	Writing prescriptions	Basic life support skills	Total	p
Number (%) of performed practical medical skills								
Excellent	80 (0.9)	11 (0.1)	12 (0.1)	0 (0.0)	1 (0.0)	2 (0.0)	106 (1.2)	**
Very good	575 (6.6)	84 (0.9)	39 (0.4)	17 (0.1)	10 (0.1)	13 (0.1)	738 (8.5)	
Good	3,050 (6.6)	304 (0.9)	131 (1.5)	124 (1.4)	26 (0.3)	36 (0.4)	3,671 (42.3)	
Sufficient	2,188 (25.2)	159 (1.8)	107 (1.2)	51 (0.5)	23 (0.2)	50 (0.5)	2,578 (29.7)	
Insufficient	1,210 (13.9)	183 (2.1)	85 (0.9)	40 (0.4)	20 (0.2)	30 (0.3)	1,568 (18.1)	
Correlation between performed practical medical skills and gender								
Male	2,412 (27.3)	260 (2.9)	117 (1.3)	129 (1.4)	29 (0.3)	51 (0.5)	2,998 (34.0)	**
Female	4,803 (54.5)	481 (5.4)	259 (2.9)	103 (1.1)	51 (0.5)	108 (1.2)	5,805 (65.9)	
Correlation between performed practical medical skills and failing a year								
Repeaters	3,983 (45.2)	371 (4.2)	192 (2.1)	138 (1.5)	48 (0.5)	85 (9.6)	4,817 (54.7)	*
Regular students	3,232 (36.7)	370 (42.0)	184 (2.0)	94 (1.0)	32 (0.3)	69 (0.7)	3,981 (45.2)	
Correlation between performed practical medical skills and students' confidence in their own work								
Absolutely certain	1,725 (19.6)	26 (0.2)	2 (0.0)	1 (0.0)	1 (0.0)	2 (0.0)	1,757 (20.4)	**
Certain	4,272 (48.6)	239 (2.7)	50 (0.5)	8 (0.0)	10 (0.1)	13 (0.1)	4,592 (53.4)	
Partially certain	1,018 (11.6)	257 (2.9)	75 (0.8)	42 (0.4)	26 (0.2)	36 (0.4)	1,454 (16.9)	
Not certain	20 (0.2)	117 (1.3)	66 (0.7)	52 (0.5)	23 (0.2)	50 (0.5)	328 (3.8)	
Absolutely not certain	0 (0.0)	97 (1.1)	183 (2.0)	129 (1.8)	23 (0.2)	30 (0.3)	462 (4.9)	

*p<0.031, **p<0.001

Those students with more skills in practical procedures have a greater level of confidence in their own work but there was no difference in their assessment of their own practical medical skill (Table 3). The results point toward a significant difference in the number of average failed years between students who lost a year and the total of students included in the study. Students (n=180) repeat an average of 1.06 years, while failed students (n=100) repeat an average of 1.84 years. Courses which, in the opinion of the students, provided them with the most practical medical knowledge were pediatrics

24.05% (32.5% fifth year; 15.6% sixth year) and internal medicine 11.85% (10.6% fifth year; 13.1% sixth year). Surgery 9.95% (11.2% fifth year; 8.7% sixth year), gynecology 5.9% (3.1% fifth year; 8.7% sixth year) and oncology 5.6% (both years) were the courses, which in the opinion of the students, provided them with the least practical medical knowledge. Students believe that with more clinical experience they would be more efficient in performing their medical vocation and would increase their level of self-confidence in their own work thus making their knowledge more applicable (Figure 1). Objective

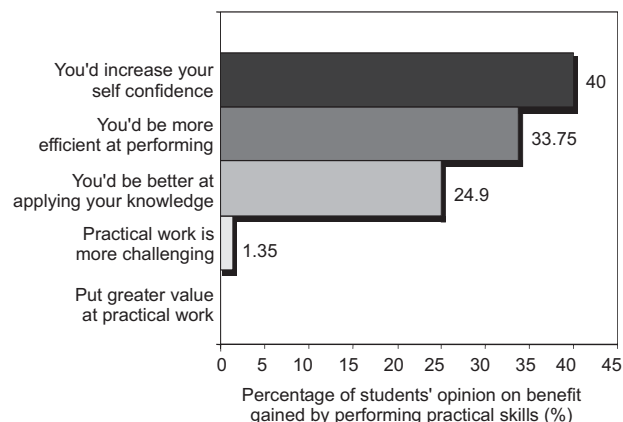


Fig. 1. Students' opinion in percentage on benefit gained by performing more practical skills during clinical years.

indicators of practical medical skill point to the fact that students have performed the highest amount of practical medical procedures in taking case histories and doing physical examinations, applications of injections intravenous, intramuscular, subcutaneous and dressing of wounds, and the least amount in stitching up wounds (Figure 2). Out of the total of students interviewed 44% are capable of writing a prescription on their own, while 52% are familiar with basic life support skills. When asked how they'd improve the efficiency of clinical courses, 1.6% of students replied that no intervention is necessary, 71.1% believes that it's necessary to increase the number of hours spent learning practical skills, while 27.2% thinks it necessary to make changes in the practical courses themselves.

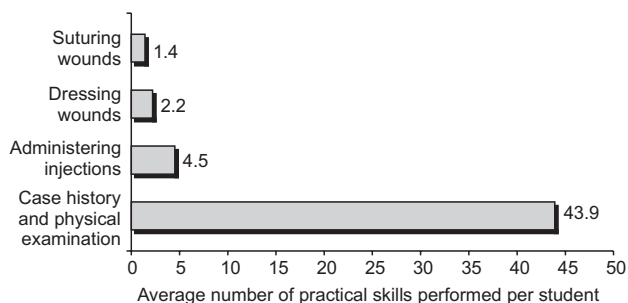


Fig. 2. An average number of practical skills performed per student in duration of undergraduate studies.

Discussion

The results of our study show that the indicators of a greater number of practical medical procedures being performed by students were: male gender, regular studying, greater level of self confidence in one's work, and a better opinion of one's practical medical knowledge. It was to be assumed that students were given a better insight into clinical practice and a certain level of clinical experience during their clinical years. That is precisely the reason that the targeted population of this study is

5th and 6th year students. In reference to the number of performed medical procedures and student gender, results have shown that men have performed more of these procedures than their female colleagues. Similar results were obtained by Helenius et al. and Lundebj et al. in their study.

Judging by the professional literature studied by the authors, regular execution of student obligations has never been linked to the number of medical procedures performed during undergraduate education. Our results have shown that a greater number of practical medical procedures have been performed by students who have, at the time of the polling, never failed a single year. This could be explained by their greater motivation for the acquisition of practical skills, in other words, by their greater self-discipline and self-confidence, which for some authors is a prerequisite for successful studying^{13,14}. The students in our study have shown that a greater number of performed clinical procedures have resulted in a better opinion of their own practical medical knowledge, which could indicate that their perception of their own knowledge is often strongly linked to their level of experience¹⁵. The students in our study have also shown that the more frequently they performed a certain clinical task, the greater was their resulting self-confidence. The same has been reported by many different authors in their research^{15,16}. It is common knowledge that clinical experience and the individual level of training are important in forming an accurate diagnosis¹⁷, and the amount of exposure to active clinical work that a student gets is vital in the education of a future clinical doctor. The acquisition and use of clinical knowledge is related to the amount of clinical experience that a student has¹⁸. To increase the student's motivation it is important to know that students are better at performing those skills which they value¹⁹, when they're being overseen by an enthusiastic mentor willing to offer feedback¹, which increases their competence²⁰. However, in order for the students to gain competence they must be given the opportunity to practice their skills²¹. It would seem that undergraduate education lacks such opportunities⁹. The consequences are that after obtaining a diploma many young doctors don't feel themselves to be sufficiently competent to work with patients, an opinion which is frequently shared by their mentors¹⁰. This presents a source of much stress for young doctors, and one of the reasons for it certainly lies in the lack of experience gained in medical school. This problem could be alleviated, or all together eradicated, by giving students ample opportunity for the adequate acquisition of those clinical skills matching real life clinical situations. The opinion is shared by both young doctors²² and our examinees that have opted in favor of an increase in hours spent in practical education by decreasing hours spent on theory studies, therefore restructuring the existing practical education to allow them to later work more efficiently. The importance of having medical education based on topics from clinical practice is also stressed out among medical doctors²³. The prevailing opinion amongst our examinees is that with more clinical experience they would be more efficient in their job performance, have an increased sense of self confidence

about their work, and that their knowledge would be more usable (Figure 1). Although it is common knowledge that learning is not a unilateral but a bilateral transfer of information from student to mentor and vice versa²⁴, during their clinical rotations many students are sent out alone to take case histories and examine patients, without supervision or feedback from mentors who are often preoccupied²⁵ or simply not motivated enough to work with students. This may increase the amount of experience students get, but not their level of expertness²⁰. When we examine the subjects which have, in the opinion of the students themselves, contributed the most to the development of their skills, the dominant positions are held by pediatrics and internal medicine. In contrast to that, in the opinion of the students, subjects like surgery, gynecology and oncology haven't participated enough in their acquisition of practical, clinical skills. Considering the well known importance of mentors in student education^{1,6,26} a possible explanation of such an array of subjects can be found in the fact that there has been a change of staff within the departments of internal medicine, pediatrics, gynecology and obstetrics, and surgery. There was a noticeable difference in the opinion of 5th year students as opposed to that of 6th year students, making it important to note that they had different teachers in precisely those subjects. Other than with the change of staff and the influence of mentors as rolemodels¹⁵ such student opinion could also be explained by the fact that these subjects have a greater number of clinical exercises than the others, but also by the success or failure of the clinical system of studying which depends on the functional communication between doctors and students²⁷, the limited access students have to patients and practical work²⁸, the role of students during their stay on clinical wards, which instead of being of an active nature is often that of an observer²⁹ and the motivation of the students themselves, which is vital in the mastering of any given clinical skill¹⁹. Seeing how we did not test our examinees' skillfulness in performing these practical tasks we weren't able to confirm the trustworthiness of their claims. Another drawback of our study is the relatively small number of examinees. Before forming a definite conclusion a further study should be plan-

ned; one which would explore the opinions of mentors and clinical staff involved in the undergraduate education of young doctors. The results of such a study should be compared to the results obtained from the student population so that a consensus, allowing the formation of a »customer friendly curriculum«, could be reached.

Conclusion

The questionnaire study conducted on two generations of 5th and 6th year students at the J. Juraj Strossmayer School of Medicine analyses the students' self-reported confidence, attitudes and skills towards practical procedures as a very important factor in medical education as well as for their future clinical environment. Study results indicate that a greater number of practical medical procedures are being performed by male students, non-repeaters, those who have a greater level of self confidence in their work, and a better opinion of their own practical medical knowledge. Upon students opinion the subjects contributing the most to the development of their skills were pediatrics and internal medicine. In contrast to that, in the opinion of the students, subjects like surgery and gynecology failed to improve their clinical skills. Students also believed they would be more efficacious (33%) and confident (32%) in their own work having their knowledge more usable (25%) if they had performed more practical procedures.

We emphasize that the combination of factors examined here, influencing the acquisition of practical knowledge and skills, and the established fact that students have, in total, performed a very small number of practical medical tasks, point to certain inadequacies and problems in students acquirement of clinical experience, and show that certain changes need to be made in that ever so delicate, and ever so important, segment of medical education. A lesser number of performed clinical attainments pointed to the drawbacks of practical training and a need for the greater engagement of students, as well as their professors, so that future physicians will be able to join the medical profession with a higher level of proficiency and experience.

REFERENCES

- SCHULTZ KW, KIRBY J, DELVA D, GODWIN M, VERMA S, BIRTHWHISTLE R, KNAPPER C, SEGUIN R, BMC Med Educ, 4 (2004) 12. — 2. PARRINO TA, PARRINO NF, Am J Med Sci, 307 (1994) 163. — 3. ENGUM SA, Am J Surg, 186 (2003) 175. — 4. SANDERS CW, EDWARDS JC, BURDENSKI TK, Acad Med, 79 (2004) 873. — 5. DORNAN R, BUNDY C, BMJ, 329 (2004) 834. — 6. ZIAEE V, AHMADINEJAD Z, MORRAVEDJI AR, Med Educ, 9 (2004) 8. — 7. HELENIUS I, SINISAAARI I, HIRVENSALO E, REMES V, J Surg Res, 102 (2002) 178. — 8. LIDDELL MJ, DAVIDSON SK, TAUB H, WHITECROSS LE, Med Educ, 36 (2002) 1035. — 9. JOLLY BC, MACDONALD MM, Med Educ, 23 (1989) 189. — 10. WISE A, RUTLEDGE A, CRAIG M, An Evaluation of the Intern Training in Queensland Hospital-1990. Queensland: University of Queensland Printer; 1995. — 11. LUNDEBY T, TRONNES H, FALCK G, Tidsskr Nor Laegeforen, 119 (1999) 2849. — 12. KOWLOWITZ V, CURTIS P, SLOANE PD, Acad Med, 65 (1990) 656. — 13. MOULAERT V, VERWIJNEN MG, RIKERS R, SCHERPBIER AJ, Med Educ, 38 (2004) 1044. — 14. LIVENS F, COETSIER P, DE FRUYT F, DE MAESENEER J, Med Educ, 36 (2002) 1050. — 15. MORGAN PJ, CLEAVE-HOGG D, Med Educ, 36 (2002) 534. — 16. LIDDELL MJ, DAVIDSON SK, Med Teach, 26 (2004) 52. — 17. BRAMMER R, Psychol Assess, 14 (2002) 110. — 18. PAPA FJ, ALDRICH D, SCHUMACKER RE, Acad Med, 74 (1999) 16. — 19. WANG TS, SCHWARTZ JL, KARIMPOUR DJ, ORRINGER JS, HAMILTON T, JOHNSON TM, Arch Dermatol, 140 (2004) 1357. — 20. MARTEAU TM, WYNNE G, KAYE W, EVANS TR, BMJ, 330 (1990) 849. — 21. PATEL VL, GROEN GJ, Med Educ, 25 (1991) 527. — 22. BRUN D, HASSID S, D'IVERNOIS JF, PRESSE Med, 28 (1999) 1121. — 23. KNEZ R, PRPIĆ I, NIKŠIĆ M, ŠKARPA-PRPIĆ I, Coll Antropol, 28 (2004) 891. — 24. IRBY DM, Acad Med, 70 (1995) 898. — 25. LEVENTHAL WD, GOODMAN BW, J Fam Pract, 13 (1981) 889. — 26. PREMADASA IG, HIJAZI Z, MOOSA A, Med Educ, 29 (1995) 355. — 27. KIHARA M, MATSUO O, KAMISAKO T, FUKADA K, ASHIDA T, TAKEMURA T, IWAMOTO I, MYAZAKI T, HASHIMOTO N, Pathophysiology, 9 (2003) 111. — 28. TAYLOR DM, Med J Aust, 166 (1997) 251. — 29. NETTERSTROM IU, GJERSOE P, ASPEGREN K, Ugeskr Laeger, 165 (2003) 3405.

V. Tomić

Vodovodna 13, 10000 Zagreb, Croatia

e-mail: vlatka_tomic@inet.hr

PROCJENA SAMOPOUZDANJA, STAVOVA I PRAKTIČNIH VJEŠTINA STUDENATA MEDICINE: STUDIJA PUTEM UPITNIKA

S A Ž E T A K

Istraživanje je provedeno s ciljem utvrđivanja utjecaja spola, gubitka akademske godine, samopouzdanja i stavova studenata na stečeno kliničko iskustvo tijekom dodiplomskog obrazovanja. Istraživanje je provedeno tijekom 2004 i 2005 godine na uzorku od 182 studenta pete i šeste godine Medicinskog Fakulteta Sveučilišta Josip Juraj Strossmayer u Osijeku. Ispitanici su podijeljeni u grupe i uspoređivani s obzirom na spol, gubitak akademske godine, broj izvedenih praktičnih medicinskih vještina i samopouzdanja pri izvođenju istih. Osim toga, ispitanici podijeljeni u grupe i uspoređivani s obzirom na vlastitu procjenu praktičnih i teoretskih znanja, kolegija koji su im omogućili stjecanje najmanje odnosno najviše praktičnih znanja i njihova stava prema sadašnjem planu i provođenju nastave kliničkih predmeta kao i mogućnostima njihova poboljšanja. Fisherov test i χ^2 test korišteni su s ciljem utvrđivanja statistički značajnih razlika između grupa, a koeficijent kontingencije s ciljem utvrđivanja njihove povezanosti. Rezultati su pokazali statistički značajne razlike između studenata koji izveli su veći broj praktičnih medicinskih vještina od studentica ($p < 0.001$), neponavljači su izveli veći broj praktičnih medicinskih vještina od ponavljača ($p < 0.001$, $C = 0.658$), dok su ponavljači imali bolje mišljenje o vlastitom teorijskom znanju od neponavljača ($p < 0.005$). Analiza podataka pokazala je statistički značajnu povezanost između kliničkog iskustva i razine samopouzdanja ($C = 0.944$). Ovim istraživanjem je utvrđeno da su na veći broj izvedenih kliničkih medicinskih vještina pozitivno utjecali: muški spol, studiranja bez gubitka godine, bolje poznavanje kliničkih vještina, sigurnost u vlastiti rad te bolje mišljenje o vlastitom praktičnom medicinskom znanju.