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Percepcija okruženja za učenje studenata dentalne medicine u Hrvatskoj, Indiji i Nepal

Self Assessment of Dental students' Perception of Learning Environment in Croatia, India and Nepal

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Sažetak

Cilj: Željela se procijeniti percepcija studenata dentalne medicine iz različitih okolina za učenje u Hrvatskoj, Indiji i Nepal. Postupci: Istraživanje je provedeno tijekom akademske godine 2016./17. Ukupno je sudjelovalo 849 studenata dentalne medicine – 188 iz Hrvatske, 373 iz Indije i 288 iz Nepala. Oni koji nisu ispunili upitnik nisu uzeti u obzir. Primijenjen je Upitnik za studente dentalne medicine o okolini za učenje (engl. *Dental Student Learning Environment Survey – DSLES*) koji se sastojao od 55 pitanja svrstanih u 7 kategorija. Njima su se mjerile percepcije fleksibilnosti, interakcija među studentima, emocionalno ozračje, potpora, stečeno iskustvo, organizacija i širina interesa. U statističkoj analizi podataka korišten je Kolmogorov-Smirnovljev test. Kruskal-Wallisova neparametrijska ANOVA također je upotrijebljena u testiranju razlika između zemalja. Post hoc analiza obavljena je s pomoću Ranksovih tablica i medijanskoga testa. Rezultati: Odgovorilo je 26,9 % studenata. Značajne razlike između zemalja nadene su za sve varijable DSLES upitnika (Kruskal-Wallis, $p < 0,01$). Medijanski test također je pokazao značajne razlike za sve varijable DSLES-a ($p < 0,01$). Kategorije s najvišim srednjim vrijednostima ocjena su *interakcije među studentima* u Indiji i Nepal te *emocionalno ozračje* u Hrvatskoj. Zaključak: Studenti u Hrvatskoj ocijenili su svoj fakultet samo ocjenama odličan i dobar, a njihovi kolege u Indiji i Nepal bili su kritičniji. Unatoč različitim okolnostima u trima zemljama, *fleksibilnost* je identificirana kao područje slabosti u svim tim sustavima obrazovanja.

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Uvod

Smjer dentalnog obrazovanja i promjene u kurikulumima dentalnih učilišta nastali su na temelju istraživanja praktičara, stručnih organizacija i akademske zajednice (1). Uočeno je da studenti dentalne medicine, kao aktivni sudionici u obrazovnom procesu, trebaju biti u središtu promjena u dentalnim kurikulumima i u poboljšanjima okoline za učenje (2, 3). Diplomski studenti moraju steći specifične vještine i znanje tijekom četiri do šest godina, koliko traje njihovo školovanje. To može biti vrlo stresno te stvaranje pozitivne okoline koja podupire učenje postaje važna zadaća svih sudionika u procesu dentalne edukacije (4, 5). Iskustva i mišljenja studenata dobi-

Introduction

The direction of dental education and changes in dental schools' curricula emerged from research by dental practitioners, professional organizations and the academic community (1). It has been recognized that dental students, as active participants in educational process, should be central to changes in dental curricula and learning environment improvements (2,3). Undergraduate dental students are required to acquire specific competences and knowledge in the 4-6 years period of their training. This can be very stressful (4), and creating positive and supportive learning environments is becoming an important goal for all the participants in the dental educa-

vena iz različitih anketa informiraju sastavljače dentalnih kurikula o perspektivi studenata (6). Mnogobrojni instrumenti razvijeni su za procjenu studentske percepcije obrazovne, emocionalne i socijalne okoline njihovih fakulteta – *Learning Environment Questionnaire*, *Dundee Ready Education Environment Measure* (DREEM), *Clinical Learning Environment Inventory* (CLEI), *Anatomy Education Environment Measurement Inventory* (AEEMI) i drugi (7, 8, 9, 10). Ustanovljeno je da percepcija studenata bolje predviđa akademski uspjeh na sveučilištima negoli uspjeh u srednjoj školi (2, 11).

Marshallovo (12) sastavljanje upitnika *Medical School Learning Environment Survey* – MSLES, omogućilo je edukatorima u zdravstvu uvid u studentsku percepciju njihove okoline za učenje. MSLES sadržava 55 pitanja podijeljenih u sedam kategorija kojima se mjeri studentska percepcija o:

- 1) *fleksibilnosti* – mogućnosti da nastavnici i studenti zajedno prilagode okolinu za učenje
- 2) *interakciji među studentima* – društvenoj i akademskoj;
- 3) *emocionalnom okruženju* – načinu na koji iskustva studenata utječu na njihovu percepciju okoline za učenje
- 4) *potpore* – o razini nastavničke potpore studentima
- 5) *stečenom iskustvu* – razini viđenja relevantnosti strukturiranog učenja za praktični rad
- 6) *organizacijama* – razini kohezije iskustva učenja u kurikulu
- 7) *širini interesa* – opsegu poticanja studenata u izvankurikularnim aktivnostima.

Pokazalo se da je MSLES pouzdan i interno konzistentan kad je riječ o mjerenju studentske percepcije njihove okoline za učenje u kurikulumima temeljenima na predavanjima i onima temeljenima na rješavanju problema (12, 13). MSLES je bio modificiran sa svrhom stjecanja uvida u studentsku percepciju njihova obrazovanja, a DSLES (*Dental Student Learning Environment Survey*) korišten je za procjenu percepcije studenata dentalne medicine (2). DSLES je zapravo identičan MSLES-u, ali su riječi *medicina* i *lijeknik* zamijenjene sintagmama *dentalna medicina* i *doktor dentalne medicine*. Pouzdanost i interna konzistencija DSLES-a slične su onima u MSLES-u (2).

Relevantne studije o studentskoj motivaciji, izvedbi i percepciji njihove okoline za učenje provodile su se na sveučilištima razvijenih zemalja Europe i Sjeverne Amerike (2, 14, 15, 16, 17, 18, 19). Studentska percepcija procijenjena DSLES-om u jednoj europskoj zemlji – u Hrvatskoj (nedavno se priključila Europskoj uniji nakon gospodarske tranzicije), uspoređena je s dvjema azijskim državama – Indijom i Nepalom. Te tri zemlje imaju različita zemljopisna, društvena i kulturna obilježja, a različiti su i načini financiranja na sveučilištima uključenima u istraživanje (dva državna i jedno privatno). Fakulteti su reprezentativni u sklopu nacionalnih standarda te su akreditirani u nacionalnim tijelima. Trenutačno nema razmjene nastavnika i studenata iz Hrvatske s ostalim dvjema zemljama, ali studenti iz Nepala slušaju kolegije u Indiji. Rezultati dobiveni za svaku zemlju mogu biti polazište za daljnja istraživanja i evaluaciju studentske percepcije o kurikulumnim promjenama i inovacijama u postupcima učenja.

U načelu se među zemljama ne razlikuju značajno očekivane kompetencije koje studenti trebaju steći tijekom studij-

tion process (5). The experiences and opinions of dental students obtained using various surveys apprise dental curricula developments from the students' perspective. (6). A number of instruments were developed to assess the students' perceptions of their academic, educational, emotional, and social environment such as Learning Environment Questionnaire, Dundee Ready Education Environment Measure (DREEM), Clinical Learning Environment Inventory (CLEI), Anatomy Education Environment Measurement Inventory (AEEMI) and others (7,8,9,10). It was found that the students' perception predicts academic success at universities more than their prior achievements in secondary school (2,11).

The development of the Medical School Learning Environment Survey (MSLES) by Marshall (12) enabled healthcare educators to gain insight into students' perceptions of their learning environment. MSLES contains 55 items subdivided into seven scales measuring students' perceptions of: 1) Flexibility - opportunities for faculty and students to modify the learning environment together; 2) Student-to-Student Interactions - social and academic; 3) Emotional Climate - the way in which students' experiences influence their affective perceptions of learning environment; 4) Supportiveness - the extent of support provided to students by faculty; 5) Meaningful Experience - the degree to which structured learning activities are seen to be relevant to practical work; 6) Organization - the degree of cohesion of learning experiences within the curriculum; and 7) Breadth of Interest - the extent to which students are encouraged to develop extracurricular activities. MSLES was reported to be a reliable and internally consistent instrument for measuring the student perception of their learning environment compared with lecture based curricula and problem-based curricula (12,13). With the attempt of gaining insight into dental students' perceptions of their education, MSLES was modified to fit the purpose, and DSLES (Dental Student Learning Environment Survey) was used to assess dental students' perceptions (2). The DSLES is virtually identical to the MSLES, but the words *medicine* and *physician* are replaced with *dentistry* and *dentist*. The reliability and internal consistency of DSLES was reported to be similar to MSLES (2).

Relevant studies on the students' motivation, performance and perception of their learning environment are associated with universities in the developed countries of Europe and North America (2,14,15,16,17,18,19). The students' perceptions using the DSLES instrument in one European country, Croatia (having recently joined the European Union after an economic transition) were compared with two Asian countries: India and Nepal. The three countries belong to different geographical, social and cultural backgrounds, and there are different finance models between the Universities included in the study (two state and one private). The colleges are representative of the national standards as they are accredited to their respective national councils. Currently, there is no student or staff exchange program between Croatia and the other two countries, but students from Nepal attend dental courses in India. The results gained from each country could be a baseline for further research, and evaluation of students' perception of curricula changes and innovations in methods of teaching.

ja. Ipak, postoje razlike u sustavima školovanja, omjeru broja studenata i nastavnika te u dostupnosti edukacijskih izvora (tablica 1.) (20, 21)

Cilj ovog istraživanja bio je procijeniti percepciju različitih okolina za učenje studenata iz Indije, Nepala i Hrvatske.

Generally, the competences expected to be acquired during studies do not differ significantly between the countries. However, there are differences in the respective educational systems, student/teacher ratios and the available educational resources (Table 1.) (20,21)

The aim of this study was to assess dental students' perception of different learning environment in India, Nepal and Croatia.

Tablica 1. Razlike među fakultetima na kojima je provedeno istraživanje
Table 1 The differences between Schools of Dental Medicine at which the research was conducted

	CROATIA	INDIA	NEPAL
Basic concept of the study	Lecture based study	Lecture based study	Lecture based study
Private or public institution	Public	Public	Private
Duration of the studies	6 years (12th semester is internship)	5 years (including 1 year of internship)	5 and half (including 1 year of internship)
Number of undergraduate students	645	974	256
Number of basic and medicine subject teachers	45	62	32
Number of dental subject teachers	147	89	24
Teacher-to-student ratio – basic-medical subjects	01:14.3	01:15.7	01:08
Teacher-to-student ratio – dental subjects	01:04.4	01:10.9	01:10.7
Percentage of lectures (classical ex catedra lectures and seminars)	2000/5100=39%	1590/5200 = 30.57%	Lectures (basic and clinical) = 3195/5887 = 54.3%
Percentage of preclinical practicals	1001/5100=19.63%	1540/5200= 29.61%	1040/5887 = 17.6%
Percentage of clinical practicals	2099/5100=41.56%	2070/5200=39.8%	1652/5887 = 28.1%
Financial costs for students (do they pay for textbooks and material for preclinical and clinical practicals) tuition fees	Students participate	Entirely by the students for textbooks and materials etc; tuition fees subsidized as they are government colleges	Entirely by the students
First contact with dental patient	3rd year (restorative dentistry under supervision)	3rd year (all clinical departments under supervision)	3rd year (all clinical departments under supervision)

Materijali i postupci

Ovo su istraživanje odobrila etička povjerenstva Stomatološkog fakulteta Sveučilišta u Zagrebu, Istraživačkog instituta Stomatološkog fakulteta Surendera, Sri Ganganagar iz Indije te državnoga Stomatološkog fakulteta iz Nepala.

U Hrvatskoj su u istraživanju sudjelovali studenti triju stomatoloških fakulteta triju sveučilišta – zagrebačkoga, riječkoga i splitskoga. U svim tim visokoškolskim ustanovama studij slijedi isti kurikulum. Istraživanje je također provedeno na Stomatološkom fakultetu i u Istraživačkom institutu Sri Ganganagar (School of Dental Medicine Surendera Dental College and Research Institute) u Indiji, te u državnome Stomatološkom fakultetu i u Sveučilišnoj bolnici Tribhuvan (People's Dental College and Hospital Tribhuvan University) u Katmanduu u Nepalu.

Istraživanje je obavljeno tijekom akademske godine 2016./17. E-pismo s poveznicom na upitnik DSLES-a poslano je svim studentima integriranog preddiplomskog i diplomskog studija (od prve do posljednje godine). U njemu je opisano istraživanje i postupak davanja pristanka za sudjelovanje. Ukupno je odgovorilo 849 studenata i to 188 iz Hrvatske, 373 iz Indije i 288 iz Nepala. Samo su ispunjeni obrasci

Materials and methods

This study was approved by Ethical Committees at the School of Dental Medicine, Zagreb, Surendera Dental College & Research Institute, Sri Ganganagar, India, and People's Dental College in Nepal.

In Croatia, students from three Schools of Dental Medicine at three Universities – Zagreb, Rijeka and Split, participated in the study. Dental studies at all three Schools that participated in this study follow the same curriculum. The research was also conducted at the School of Dental Medicine, Surendera Dental College & Research Institute, Sri Ganganagar, India and People's Dental College and Hospital, Tribhuvan University, Kathmandu, Nepal.

The study was conducted during a period of academic year 2016/17. An email containing the link to Dental School Learning Environment Survey (DSLES) was sent to all dental undergraduate (first to final year) students. The research and consent procedures were described in the e-mail. A total of 849 dental students responded. Of this group, there were 188 responses from Croatia, 373 from India, and 288 from Nepal. Only completed forms were considered for the analysis and non-responders were excluded.

uzeti u obzir, a studenti koji nisu odgovorili nisu sudjelovali u istraživanju.

Upitnik DSLES-a sastoji se od 55 pitanja, a za ispunjavanje je potrebno od 10 do 15 minuta. Pitanja su podijeljena u sedam skupina na temelju sedam kategorija studentske percepcije okoline za učenje (kako je opisano u uvodu). Upitnik je preveden na hrvatski i vrednovan prije raspodjele. Dva deset studenata posljednje godine dalo je primjedbe na neke izraze u upitniku, pa su ga uskladila tri nastavnika Stomatološkog fakulteta, uključujući i prodekana za studente. Dopusštenje za korištenje upitnika DSLES-a u istraživanju dao je njegov autor profesor David L. Henzi.

Odgovori na pitanja u upitniku davani su prema Likertovoj ljestvici od četiri stupnja: A = rijetko, B = katkad, C = prije češće negoli ne i D = vrlo često. Također je ponuđen odgovor E, ako studenti nisu imali dovoljno informacija da bi ponudili odgovor. Neka pitanja postavljena su u afirmativnom obliku, a neka u negacijskom. Pri statističkoj obradi podataka srednja vrijednost za svaki afirmativni odgovor izračunata je tako da se odgovorima A, B, C i D redom pripisivalo 1, 2, 3, odnosno 4 boda (2). Kod negacijski sročenihi pitanja bodovi su pripisivani suprotno, tako da su pozitivne ocjene dobile više bodova. Ako je odgovor bio E, pitanje nije bilo uključeno u kalkulaciju srednje vrijednosti ocjene za pojedino pitanje.

Uz spomenutih 55 pitanja u upitnik DSLES-a dodana su pitanja vezana za demografiju i samoprocjenu. Uključivala su sljedeće izbore: (i) dodiplomski ili postdiplomski, (ii) godina studija (1 – 6), (iii) samoprocjena uspjeha tijekom studija (izvršno, dobro, loše), (iv) samoprocjena interesa za studij (izvrstan, dobar, loš), (v) procjena kvalitete obrazovanja (izvršna, dobra, loša), (vi) pad na ispitu ispitu tijekom studija (da/ne).

Statistička analiza obavljena je softverskim paketom SPSS ver. 17 (IBM, Armonk, NY, SAD). Odgovori na pitanja u DSLES-u bili su ordinalne prirode, koristeći se gore navedenim sustavom ocjenjivanja. Za procjenu o tome je li distribucija normalna u cijelom uzorku i za pojedine zemlje, korišten je Kolmogorov-Smirnovljev test. Razlike među zemljama testirane su s pomoću Kruskal-Wallisove neparametrijske ANOVA-e jer su u istraživanje bile uključene tri zemlje, a nije potvrđena normalna distribucija podataka. Post hoc analiza provedena je Rankovim medijanskim testom. Odgovori na dodatna pitanja (i-vi) analizirani su Mann-Whitneyjevim testom.

Praćenje izdvojenih skupina i kvalitativna analiza u ovoj studiji nije odabrana zbog kulturoloških razlika među zemljama. S obzirom na to da je ovo bila pilot-studija, činio se prikladnijim kvantitativni postupak.

Rezultati

Postotak odgovora bio je nizak – 26,9 %. Ukupan broj sudionika u Hrvatskoj bio je 188 (34 studenta i 154 studentice – 18,1 % vs. 81,9 %), u Indiji 373 (161 student i 212 studentica – 43,2 % vs. 56,8 %), i u Nepal 288 (79 studenata i 209 studentica – 27,4 % vs. 72,6 %). Postotak odgo-

The DSLES survey consisted of 55 questions, and was designed to take 10-15 minutes to complete. The questions were divided into seven groups based on the seven categories of student perceptions of their learning environment (as described in the Introduction). The survey was translated into the Croatian language and face validated before being distributed. Twenty students of the final year gave objections on some expressions in the test and three teachers of the Dental School including the Vice dean for the student affairs reviewed the questionnaire. The permission to use the DSLES survey in the research was obtained from the author of the questionnaire, Professor David L. Henzi.

Responses to the survey questions were given using a four-point Likert scale: A=seldom, B=occasionally, C=more often than not, and D=very often. Additionally, answer E was offered when students did not have enough information to answer the question. Some questions were stated in the affirmative form, and some in the negative form. When statistically analysing the data, a mean score for each affirmative question was calculated by adding 1, 2, 3 or 4 points to A, B, C and D answers, respectively (2). The score was reversed in questions that were negative formatted in such a fashion that positive ratings received higher scores. If the answer was E, the question was not included in calculating the mean score for the specific DSLES item.

Apart from the 55 DSLES items, additional demographic and self-assessment questions were added. They included the following choices: (i) graduate or postgraduate, (ii) year of study (1-6), (iii) self-estimated success during the studies (excellent, good, bad), (iv) self-estimated interest for the studies (excellent, good, bad), (v) appraisal of educational quality (excellent, good, bad), (vi) failing an exam during studies (yes/no).

The statistical analysis was carried out using SPSS ver. 17 software package (IBM, Armonk, NY, USA). The nature of answers provided for each question in DSLES was ordinal by applying the afore-mentioned scoring system. To confirm the normality of distribution of the data, the Kolmogorov Smirnov test was applied to the entire database, and to the database split by countries. The differences between countries were also tested using the Kruskal-Wallis “non-parametric ANOVA” because there were three schools included and the normality of distribution of the data had not been established. Post hoc analysis of the data was performed using the Median Test by Rank. For the additional questions (i-vi) the analysis was conducted using the Mann-Whitney test.

Focus groups and qualitative research was not chosen for this study because of culture differences between the countries. Since this was a pilot study, a quantitative method seemed more appropriate for the first step.

Results

The response rate was low at 26.9%. The total number of participants in Croatia was 188 (34 males and 154 females: 18.1% vs. 81.9%), in India 373 (161 males and 212 females: 43.2% vs. 56.8%), and in Nepal 288 (79 males and 209 females: 27.4% vs. 72.6%). The gender response rates were in

vora prema spolu odgovarao je omjeru spolova na fakultetima u Hrvatskoj, no u Indiji i Nepal u znatno se razlikovao ($p > 0,05$) – u Indiji je bilo više studenata, a u Nepal u studentica.

Dob studenata u Hrvatskoj bila je između 18 i 24 godine ($22,54 \pm 1,69$ god.) u Indiji od 23 do 28 ($25,30 \pm 0,96$), a u Nepal u od 18 do 34 ($22,88 \pm 2,95$).

Distribucija nije bila normalna ($p < 0,05$) za sve potkategorije DSLES-a za svaku zemlju i za sve zemlje kombinirano. Ni u složenim varijablama distribucija nije bila normalna, poput *interakcije među studentima* i *emocionalnog ozračja* u hrvatskoj skupini, svih varijabli u nepalскоj skupini te *fleksibilnosti* i *interakcije među studentima* u indijskoj skupini.

Razlike među zemljama nađene su za sve varijable DSLES-a koristeći se neparametrijskim Kruskal-Wallisovim testom s χ^2 vrijednostima od 52,55 do 210,73, $df = 2$, $p < 0,01$. Medijanski test također je pokazao razlike među zemljama za sve varijable s χ^2 vrijednostima od 46,35 do 171,54, $df = 2$ i $p < 0,01$. Ocjene (skorovi) su u tablici 2., a grafikon s obrnutim skorom je na slici 1.

Studenti u Hrvatskoj na različitim godinama ocjenjivali su sve kategorije DSLES-a. Ipak, *širina interesa* bila je značajno različita (Kruskal-Wallisov test, $p < 0,05$). Razlike su bile značajnije između nižih (prva i druga) i viših godina studija, posebno kad je riječ o šestoj.

U Indiji su razlike između godina studija bile značajne za sve kategorije, osim za *fleksibilnost* ($\chi^2 = 3,52$, $df = 2$ $p > 0,05$). Ocjena za *studentske interakcije* povećavala se s višim godinama studija, a ocjena ostalih kategorija se smanjivala.

U Nepal u su ocjene svih kategorija bile znatno različite ($p < 0,05$), osim za *studentske interakcije* ($\chi^2 = 8,38$, $df = 2$ $p > 0,05$). Vidljivo je bilo i smanjenje kategorija prema višim godinama za sve značajno različite varijable.

U Hrvatskoj i u Nepal u nije bilo statistički značajnih razlika u ocjenjivanju kategorija DSLES-a ($p > 0,05$) među skupinama studenata koji su različito ocijenili svoj ukupni uspjeh. No nitko u Hrvatskoj nije ocijenio svoj ukupni uspjeh kao loš (slika 2.) Razlike u ocjeni kategorija DSLES-a kod Indijaca bile su značajne prema samoprocjeni uspjeha na studiju ($\chi^2 = 17,91 - 63,07$, $df = 1$ $p < 0,01$). Studenti koji su procijenili svoj uspjeh izvrsnim imali su najniže srednje vrijednosti, a studenti koji su smatrali svoj uspjeh lošim imali su najviše srednje vrijednosti za sve kategorije, osim za *studentske interakcije* koje su pokazale suprotnu distribuciju.

accordance with the student intake in the Schools in Croatia, but in India and Nepal gender response rates differed significantly ($p > 0,05$) - in India there were more male respondents and in Nepal there were more female respondents.

The age of the students in Croatia ranged from 18 to 24 ($22,54 \pm 1,69$ years) in India from 23 to 28 ($25,30 \pm 0,96$), and in Nepal from 18 to 34 ($22,88 \pm 2,95$).

The distribution was found not to be normal ($p < 0,05$) for all DSLES subscales for all countries combined and for each country. When composite variables were tested they were similarly not normally distributed, such as: 'Student to student interactions' and 'Emotional climate' in the Croatia group; all variables in Nepal group and 'Flexibility' and 'Student to student interactions' in the India group.

The differences between the countries were found for all DSLES variables using the non-parametric Kruskal-Wallis test, with χ^2 values from 52,55 - 210,73, $df = 2$ and $p < 0,01$. The Median test also showed differences between the countries for all DSLES variables, χ^2 were from 46,35 - 171,54, $df = 2$ and $p < 0,01$. Scores are given in Table 2, and reverse score chart is represented in Figure 1.

Students in Croatia in different years graded all DSLES subscales. However, the 'Breadth of interest' was significantly different (Kruskal-Wallis test, $p < 0,05$). The differences were more expressed between the lower years (1st and 2nd) and the higher years, especially 6th year.

In India, the differences between the study years were significant for all the subscales except 'Flexibility' ($\chi^2 = 3,52$, $df = 2$ $p > 0,05$). The grading for 'Student-to-student interactions' increased and grading for other subscales decreased as the study year progressed.

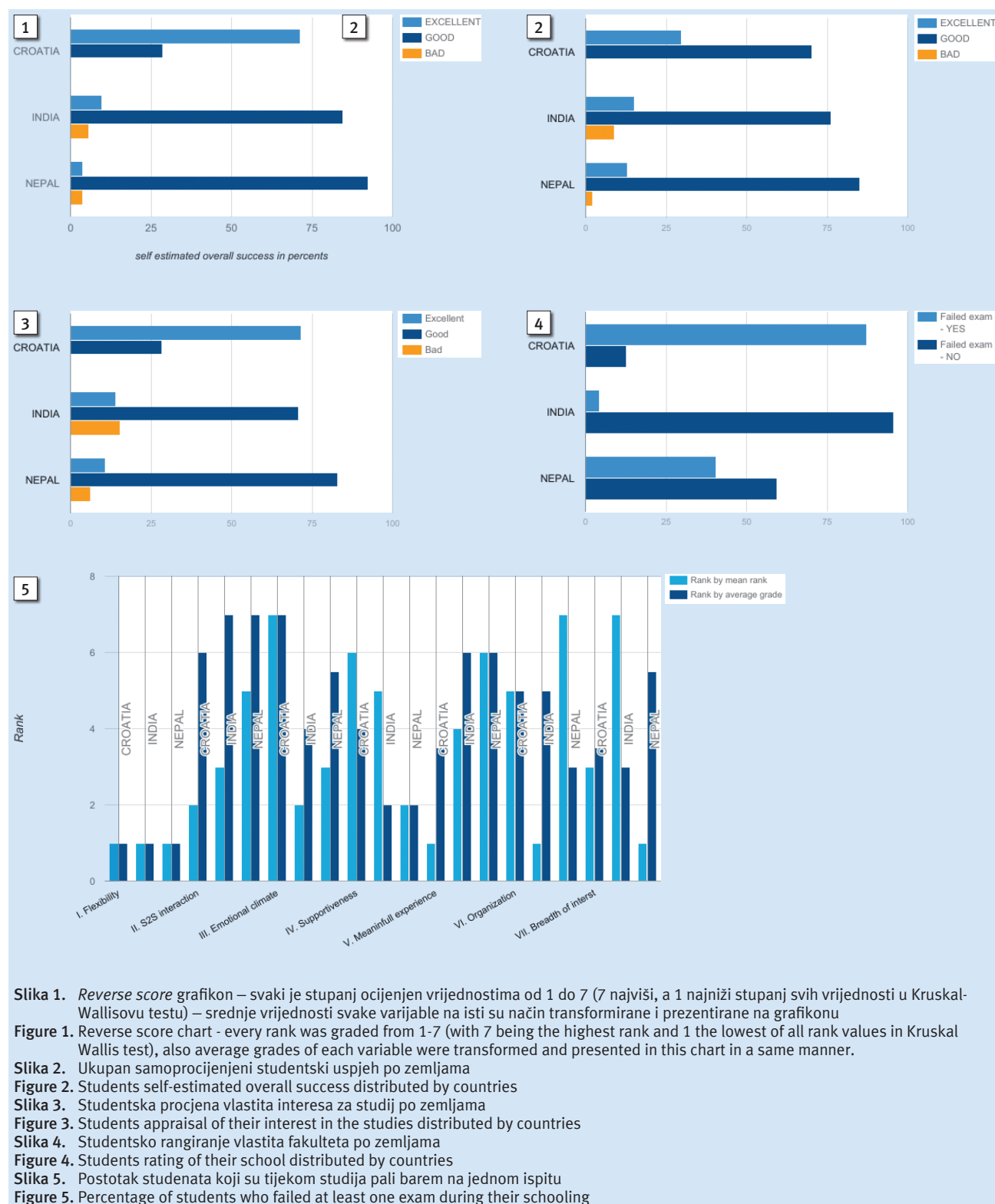
In Nepal, the grades were significantly different for all subscales ($p < 0,05$) except for 'Student-to-student interaction' ($\chi^2 = 8,38$, $df = 2$ $p > 0,05$). There was a noticeable decrease in ranks towards higher years for all significantly different variables.

In Croatia and Nepal, there were no statistically significant differences ($p > 0,05$) between the groups of students that differently assessed their overall success in grading DSLES subscales. However, no-one in Croatia appraised their overall success as "bad" (Figure 2.) There was a significant difference in DSLES subscales for Indian students ($\chi^2 = 17,91 - 63,07$, $df = 1$ $p < 0,01$) relating to the self-assessed study success. The

Tablica 2. Ocjene za sedam kategorija Ankete o okolini za učenje na dentalnim fakultetima (*engl. Dental School Learning Environment Survey – DSLES*) upotrijebljene 2016. za procjenu okoline za učenje u Hrvatskoj, Indiji i Nepal u

Table 2. Scores for seven subscales of Dental School Learning Environment Survey (DSLES) used for the assessment of the learning environment in Croatia, India and Nepal, 2016.

DSLES subscales	Croatia (n=188)		India (n=373)		Nepal (n=88)	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Flexibility	2.2902	0.49057	1.877	0.57785	2.0229	0.47005
Student to student interactions	2.8376	0.49002	2.5448	0.39974	2.8015	0.47389
Emotional climate	3.0773	0.60728	2.222	0.55093	2.5024	0.53825
Supportiveness	2.82	0.58792	2.0453	0.57245	2.1965	0.55636
Meaningful experience	2.5723	0.59843	2.3199	0.44494	2.5989	0.4831
Organization	2.7799	0.54023	2.1422	0.49174	2.582	0.45882
Breadth of interest	2.5775	0.5149	2.2168	0.3685	2.325	0.45624



Kad je riječ o interesu za studij, distribucija je bila slična kao i za samoprocjenu uspjeha (slika 3.). U Hrvatskoj je statistički značajna razlika pronađena među dvjema kategorijama – *interakciji među studentima* ($\chi^2 = 6,67$ $df = 2$ $p < 0,05$) i *emocionalnom ozračju* ($\chi^2 = 3,95$ $df = 1$ $p < 0,05$). Skupina studenata, koja je svoj interes za studij procijenila dobrim, dala je više srednje ocjene. U Indiji su razlike bile statistički

students who appraised their overall success as excellent had the lowest mean ranks, and students who considered their success as bad had the highest mean ranks for all variables except for variable II 'Student to student interaction' which showed the opposite distribution.

'Interest in the studies' was distributed similarly as the self-assessment data (Figure 3.) In Croatia, there was a statis-

značajne za sve kategorije DSLES-a – $p < 0,01$, osim za *stečeno iskustvo* ($\chi^2 = 4,03$ $df = 2$ $p > 0,05$), a ocjene za tu kategoriju pokazale su približno jednaku distribuciju među skupinama koje su procijenile svoje iskustvo kao izvrsno, dobro ili loše. Za *interakciju među studentima* vrijednost srednje ocjene smanjivala se od izvrsnog interesa prema lošem, a ostale kategorije pokazale su suprotno. U Nepalju je većina kategorija pokazala statistički značajnu razliku ($p < 0,05$) osim za *fleksibilnost* i *emocionalno ozračje* ($\chi^2 = 2,54$ i $4,55$ $df = 2$ $p > 0,05$). Za *fleksibilnost* je distribucija srednjih vrijednosti bila ujednačena.

Studenti u Hrvatskoj ocijenili su svoje fakultete samo ocjenama izvrstan i dobar, a njihovi kolege u Indiji i Nepalju bili su kritičniji (slika 4). U Hrvatskoj su ocjene među svim kategorijama bile statistički značajno različite među skupinama studenata koji su svoj fakultet ocijenili izvrsnim ili dobrim ($\chi^2 = 6,49 - 40,69$ $df = 1$ $p < 0,01$). Jedina je iznimka bila *širina interesa* za koju se ocjene nisu znatno razlikovale. Za ostale kategorije srednje vrijednosti bile su više za skupinu studenata koja je ocijenila svoj fakultet dobrim. U Indiji su kategorije *fleksibilnost*, *interakcija među studentima* i *stečeno iskustvo* pokazale statistički značajne razlike ($\chi^2 = 8,15 - 48,97$ $df = 2$, $p < 0,05$). Srednje ocjene za te kategorije smanjivale su se zajedno sa studentskim ocjenama za njihove fakultete. U Nepalju je statistički značajna razlika pronađena za *stečeno iskustvo* i *organizaciju* ($\chi^2 = 12,03$ i $10,19$ $df = 2$ $p < 0,01$). U oba slučaja, slično kao i u Indiji, srednje su se ocjene smanjivale zajedno sa studentskim ocjenama za njihove fakultete.

U Hrvatskoj je većina studenata pala barem na jednom ispitu (slika 5.). U Indiji je vrlo mali postotak pao barem na jednom ispitu, a u Nepalju je bio malo viši negoli u Indiji. U Hrvatskoj ove dvije skupine studenata nisu statistički znatno različito ocijenile kategorije DSLES-a, osim *organizacije* ($U = 1404$ $p < 0,05$ srednja ocjena DA 91,06, srednja ocjena NE 118). U Indiji su sve kategorije DSLES-a ocijenjene statistički značajno različito (U je bio između 288 i 1776, $p < 0,01$), srednjom ocjenom uvijek većom u skupini koja nije pala ni jedan ispit, osim za *interakciju među studentima*. U Nepalju su samo dvije kategorije ocijenjene statistički znatno različito – *stečeno iskustvo* i *organizacija* ($U = 8301,5$ i 7983 $p < 0,05$). U oba slučaja srednje ocjene bile su veće u skupini koja nije pala ni jedan ispit. Ova studija provedena je samo na temelju upitnika kao pilot-studija o studentskoj percepciji njihove okoline za učenje. Zato nije bilo ciljanih skupina ni intervjua sa studentima.

Rasprava

Nesporno je da je akademsko ozračje pod snažnim utjecajem kulturoloških okolnosti. Suvremeni globalni edukacijski trend poticanja studentskih i nastavničkih razmjena posebno je istaknut u Europi u programima koji podupiru slobodno kretanje studenata u Uniji (22). Studenti iz različitih zemalja

statistički značajno razlikuju ocjene za iste kategorije. Statistički značajna razlika je pronađena za *stečeno iskustvo* ($\chi^2 = 6,67$ $df = 2$ $p < 0,05$) i *emocionalno ozračje* ($\chi^2 = 3,95$ $df = 1$ $p < 0,05$). U Indiji, razlike su bile statistički značajne za sve subscale $p < 0,01$, osim za 'Meaningful experience' ($\chi^2 = 4,03$ $df = 2$ $p > 0,05$). Dok su ocjene za subscale 'Meaningful experience' pokazale približno jednaku distribuciju između grupa koje su procijenile svoje iskustvo kao izvrsno, dobro ili loše, ostale subscale pokazale su suprotno. U Nepalju, većina subscale pokazala je statistički značajnu razliku ($p < 0,05$) osim za 'Flexibility' i 'Emotional climate' subscale ($\chi^2 = 2,54$ i $4,55$ $df = 2$ $p > 0,05$). Za 'Flexibility' je distribucija srednjih vrijednosti bila ujednačena.

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Discussion

It could not be argued that academic climate is strongly influenced by the cultural circumstances. Contemporary global educational trend of encouraging student and staff exchange is especially emphasized in Europe through programmes supporting the free movement of students across

smatraju da međunarodne razmjene mogu poboljšati njihovo znanje i samosvijest vezano uz kulturne posebnosti (23). Taj globalni trend dovodi studente iz različitih kulturnih pozadina u interakciju, te se ističe važnost vrjednovanja studentske potrebe i njihova percepcija okoline za učenje kako bi se ubrzala prilagodba u zemlji domaćinu. Iako trenutačno nema programa razmjene između Hrvatske kao europske zemlje te azijskih država Indije i Nepala, usporedba studentskih stajališta o okolini za učenje može biti osnova za takav program u budućnosti.

Unatoč razlikama u obrazovnim sustavima između triju zemalja (tablica 1.), stajališta studenata dentalne medicine o njihovu školovanju u Hrvatskoj, Indiji i Nepal, čine se razmjerno konvergentnima, kako je uočeno i u dosadašnjim studijama (24).

U rezultatima je postojala razlika u distribuciji srednjih ocjena prema stupnju (slika 1.). Najviše ocjene dodijeljene su za kategoriju *interakcije među studentima*, a najniže za *fleksibilnost*; iako je stupanj ocjene dobiven Kruskal-Walisonim testom (stupanj prema srednjoj ocjeni vrijednosti) koji pokazuje što studenti smatraju bitnim, one su različito distribuirane. U Hrvatskoj je najviši stupanj i ocjenu dobilo *emocionalno ozračje*, što ga čini najbolje ocijenjenom, ali i najvažnijom varijablom u ovoj analizi. Studenti u Indiji najveće su značenje dali *širini interesa*, ali ocijenili su je trećom najnižom ocjenom. Studenti u Nepal, vrjednovali su *organizaciju* kao kategoriju posebnog značenja, no također su je ocijenili trećom najnižom ocjenom.

Premda je *fleksibilnost* ocijenjena najnižim ocjenama u svim trima zemljama, njezin utjecaj na mišljenje studenata dosta je snažan (ocjene prema srednjem rangu 4 ili više), što čini razmatranje fleksibilnosti vrijednim u analizi i razvoju budućeg kurikula.

Kurikuli se pretežito temelje na predavanjima i strogo su podijeljeni prema područjima pojedinih odjela/katedri. Također su podijeljeni u previše nastavnih planova i kataloga znanja. Nekoliko tema se i ponavlja. Na primjer, teme iz predmeta Dentalni materijali predaju se barem dva puta zato što svaki dentalni klinički predmet uključuje i dentalne materijale. Zapravo su i izvješća ustanova *Institute of Medicine of the National Academy of Sciences* i *American Dental Education Association Commission* pokazala da dentalni kurikuli sadržavaju redundantni i irelevantni sadržaj, ne odražavaju potrebe suvremene dentalne prakse i nedostaje im učinkovita ugradnja bazičnih znanosti u kliničke (1, 25, 26).

Lanning i suradnici (15) su SWAT-om analizirali studentsku percepciju revidiranog kurikula na *Virginia Commonwealth University School of Dentistry* te su preporučili da rano kliničko iskustvo treba maksimalno povećati, da očekivanja od učenja moraju biti jasno postavljena, da opterećenje kolegijima po semestrima mora biti uravnoteženo te da bazični, društveni i klinički predmeti moraju biti integrirani (različite skupine nastavnika različitih specijalnosti nalaze se i izmjenjuju informacije) (15). U kurikulima triju zemalja iz naše studije postoje neki jasno vidljivi nedostaci u kontekstu navedenih preporuka. Studenti razmjerno rano steknu iskustvo u kliničkom radu (treća godina studija), no očekivanja od učenja na klinici nisu u cijelosti usklađena s prekliničkim

EU (22). Students from different countries found that international exchanges could enhance students' knowledge and self-awareness related to cultural competence (23). This global trend brings students from different cultural backgrounds in interaction highlighting the importance of appreciating students' needs and their perception of learning environment in order to facilitate their accommodation in a host country. Despite the current lack of exchange programme between Croatia as European country and India and Nepal as Asian countries, a comparison of the student perspective of learning environment could be a foundation for such future programme.

Despite the differences in the educational systems of the three countries (Table 1.), dental students' views regarding their education in Croatia, Nepal and India appear to be relatively convergent, as was noticed in previous studies (24).

There was a difference in average grade distribution compared to ranks (Figure 1). The highest grades were given for subscale 'Student to student interaction', and the lowest for 'Flexibility'; even though the rank grades gathered from Kruskal Wallis tests (rank by mean rank grade), that reflect what students think is important, they are differently distributed. In Croatia the highest rank impact and also grades are given to 'Emotional climate' which makes it the best graded and also the most important variable in this assessment. Students in India gave the highest importance to 'Breadth of interest', while graded it with the 3rd lowest grade. Students in Nepal value 'Organization' as a subscale of particular importance, and also graded it with the third lowest grade.

Although 'Flexibility' was graded with lowest grades in all three countries, its impact on students' opinion is quite high (Grades by mean rank being 4 or above) which makes it worth considering while analyzing and developing the future curriculum.

The curricula are largely lecture based with strictly divided departmentalized areas. The curriculum is overly divided into compartments of syllabuses and catalogues of knowledge. Also, there are several redundant topics. For example the topics from the subject 'Dental materials' are taught at least twice, because every dental clinical subject includes the topics about dental materials. In fact, the reports of Institute of Medicine of the National Academy of Sciences and American Dental Education Association Commission, showing that dental curricula contained redundant and irrelevant content, did not reflect contemporary dental practice, and were lacking effective integration between the basic and clinical sciences (1,25,26).

Using the SWAT instrument Lanning *et al.* (15) analyzed students' perceptions of a revised curriculum at the Virginia Commonwealth University School of Dentistry, and they recommended the following: the early patient care experiences should be maximized; learning expectations should be clearly set; course loads between semesters should be balanced; basic, social, and clinical sciences should be integrated (diverse faculty groups with various expertise come together to share information) (15). In the curricula of the three countries from our study, there are some clearly notable deficiencies in the context of the above mentioned recommen-

vježbama. Na primjer, pretkliničke vježbe iz restaurativne dentalne medicine u znatnoj se mjeri temelje na Blackovim načelima, za razliku od kliničkih vježbi u kojima se izrađuju adhezivni kaviteti. Također, studenti u Hrvatskoj nisu usredotočeni na klinički rad i dentalne kolegije jer su zaokupljeni bazičnim i medicinskim predmetima koje su slušali prethodni semestar. Očekivanja u učenju su manje-više jasna kad je u pitanju teoretsko znanje, ali kad je riječ o konkretnim kliničkim kompetencijama, očekivanja za pojedini semestar nisu tako jasno određena. Različite skupine nastavnčkog osoblja rijetko se sastaju da bi razmijenile informacije o studentima i studiranju. Predloženo je da se sastanu radne skupine sastavljene od različitih specijalista, studenata i diplomanata te da razgovaraju o aspektima kurikula, uključujući više učenja temeljenog na rješavanju problema, umjesto učenja temeljenog na predavanjima. To također može biti postignuto u forumima koji su dio fakultetskih platforma za e-učenje, a nadziru ih nastavnici (27).

Potpورا je kategorija za koju je nađena zanimljiva razlika među zemljama. Ta je varijabla bila veoma važna hrvatskim i indijskim studentima, no Hrvati su je ocijenili višom ocjenom negoli Indijci, što sugerira da je, bez obzira na to što je smatraju jednako važnom, zadovoljstvo potporom dosta različito. Možda se to može djelomično objasniti povoljnijim omjerom nastavnika i studenata u Hrvatskoj, posebno kad su u pitanju dentalni predmeti. U Nepal u tu varijablu nisu smatrali toliko važnom, a nije ni dobro ocijenjena na ukupnoj ljestvici. Ta razlika može se objasniti činjenicom da je fakultet u Nepal privatni. I drukčiji način učenja koji se preferira u azijskim i europskim kulturama, jedan je od čimbenika koji možda utječe na studentsku percepciju njihova akademskog okruženja (28, 29). Unatoč heterogenostima unutar svake istraživane populacije, postoji tradicionalan pristup usvajanju znanja u istočnim i zapadnim civilizacijama. Izostanak potpore i brige nastavnika za napredak dodiplomskih studenata prepoznat je kao velik izvor stresa među studentima, uz ispitnu tjeskobu, ograničeno vrijeme za odmor i prilagodbu kliničkoj fazi obrazovanja (16, 19, 30, 31). Nadalje, potpora je prepoznata i istaknuta kao jedna od četiriju najvažnijih karakteristika dobrog kliničkog nastavnika, uz kompetentno i suosjećajno pružanje zdravstvene usluge, učinkovito nadziranje te različit i dinamičan pristup poučavanju (32).

Uzme li se u obzir stadij dentalne edukacije (studentska godina), nekoliko je razlika među zemljama. Hrvatski su studenti ocjenjivali kategorije DSLES-a nižim ocjenama kako su napredovali u studiju, no nije bilo razlike za *širinu interesa*. U slučaju indijskih studenata, *fleksibilnost* je jednako ocijenjena na različitim godinama studija. Ostale kategorije dobile su niže ocjene na višim godinama, slično kao i u Hrvatskoj, a iznimka je *interakcija među studentima*. Zato bi interakcije među studentima mogle pridonijeti poboljšanju njihova obrazovnog procesa. Za razliku od indijskih studenata, njihovi kolege u Nepal konzistentni su u ocjenjivanju svojih interakcija tijekom studija.

Bilo je nekoliko točaka povezanih sa studentskim samoprocijenjenim uspjehom koje su se razlikovale među zemljama i mogu činiti obrazovni proces prikladnijim za pojedini način učenja i za pojedinu studentsku populaciju. Nijedan

Students experience patient care relatively early (3rd year of the study), but learning expectations at the clinic are not entirely consistent with their preclinical practicals. For example, preclinical courses of restorative dentistry are to a considerable degree based on Black's principles, unlike the clinical practice where adhesive cavities are performed. Also, in Croatia, the students are not focused on clinical work and dental courses because they are preoccupied with learning for basic and medical exams- the courses that they have attended the previous semester. Learning expectations are more or less clearly set when it comes to theoretical knowledge, but when it comes to actual clinical competences; the expectations for a particular semester are not so clearly set i.e. stage that this study was carried out. Diverse faculty groups rarely come together to share information regarding students and studying. It is suggested that that working groups consisting of various specialties, students and graduates come together and to debate aspects of the curriculum, including more problem based learning, instead of lecture based delivery. It could be also accomplished through the structural, teacher supervised, forums available on faculty e-learning platform (27).

Supportiveness was the subscale that showed an interesting cross country difference. While this variable is very important for Croatian and Indian students it has been graded with a better grade in Croatia than in India, suggesting that although students find it to be equally important, their satisfaction with supportiveness is quite different. Perhaps this can partly be explained by a more favorable teacher/student ratio in Croatia, especially for dental subjects. In Nepal, that subscale was not considered as important, and was also not graded well on the overall scale. This difference might be explained by the fact the School in Nepal is a private institution. Also, the different learning style preferred in Asian and European culture is one of the factors that could influence student perception of their academic environment (28,29). Despite certain heterogeneity of each studied population, there is traditional approach to knowledge acquiring in Eastern and Western civilization. The lack of supportiveness and faculty concern for the progress of undergraduate students has been recognized as an important source of stress among students, along with examination anxiety, limited leisure time, and adaptation to the clinical phase of their education (16,19,30,31). Furthermore, supportiveness has been recognized and pointed out as one of four most important characteristics of a good clinical teacher, besides being competent and compassionate health care provider, effective supervisor and employing a varied and dynamic approach to teaching (32).

Considering the stage of dental education (study year), several differences between the countries were noticed. Croatian students graded DSLES subscales with lower grades as they advanced in their studies but there was no difference for the 'Breadth of interest' subscale. In the case of Indian students, flexibility was graded uniformly low over the years. Other subscales received lower grades with the advancement of the studies, similarly as in Croatia, except Student-to-student interactions. Therefore, encouraging student-to-student interaction could contribute to the improvement of their educational process. In contrast to Indian students, their col-

hrvatski student nije svoj ukupni uspjeh smatrao lošim, što je suprotno stajalištu studenata u Indiji i Nepal u koji su bili kritičniji. U Indiji su studenti koji su svoj uspjeh procijenili lošim dali više ocjene svim kategorijama osim *interakcijama među studentima*. To bi moglo značiti da oni osjećaju kako drugi kolege kočuju njihov profesionalni razvoj u smislu da su kompetitivni i izbjegavaju dijeljenje iskustava o učenju i studiju. Nadalje, hrvatski studenti koji procjenjuju svoj interes za studij izvrsnim dali su lošije ocjene *interakcijama među studentima* i *emocionalnom ozračju*. Može se zaključiti da studenti koji su manje zainteresirani za kurikulum, više vrjednuju društveni aspekt studija. Naprotiv, u Indiji su studenti koji su procijenili svoj interes za studij izvrsnim, ocijenili su i svoje interakcije s ostalim studentima vrlo vrijednim. U Nepal u je pronađena korelacija između ocjenjivanja kategorija DSLES-a visokim ocjenama i velikog interesa za studij, što je prilično različito negoli kod njihovih kolega u Indiji i Hrvatskoj. Također nema poveznice između ocjene za fleksibilnost i emocionalno ozračje s njihovim interesom za studij. To se može pripisati i činjenici da je fakultet privatn, a ne javan.

Bilo je dosta neočekivano to što su hrvatski studenti koji su svoj fakultet ocijenili dobrom, a ne izvrsnom ocjenom, dali veće ocjene svim kategorijama DSLES-a. Naprotiv, studenti u Indiji i Nepal u koji su bolje ocijenili svoje fakultete obično su davali i više ocjene. Nadalje, očito je da u svim tri ma zemljama varijabla *stečeno iskustvo* može biti visoko povezana s percepcijom kvalitete fakulteta, uključujući čimbenike povezane s administracijom, postupke poučavanja i različite oblike potpore studentima (33). Buduće istraživanje koje bi procjenjivalo percepciju okoline za učenje sa stajališta nastavnčkog osoblja, moglo bi se koristiti u interpretaciji ovih rezultata. Strategija praćenja obuhvaća bilježenje promjena u kurikulumu i u studentskoj demografiji tijekom idućih pet godina i ponavljanje ankete za pet godina u svakoj zemlji.

Zaključno, nalazi iz ove studije pokazali su značajne razlike između studenata dentalne medicine prema ocjenama različitih kategorija DSLES-a u Hrvatskoj, Indiji i Nepal u. Uočeno je da, uz nedostatak fleksibilnosti, potpore i kurikula temeljenih na predavanjima, postoji znatan prostor za poboljšanje okolina za učenje u svim tri ma akademskim okruženjima.

Potpora

Ova je studija financijski potpomognuta od Sveučilišta u Zagrebu kroz projekt: „Evaluacija korijenskih mikrostruktura za vrijeme strojne i ručne instrumentacije korijenskih kanala”.

Sukob interesa

Nije bilo sukoba interesa.

leagues in Nepal value their interaction consistently in an equal manner over the course of their education.

There were some points connected to students' self-estimated success which differed between different nations and could make the educational process more suited to different learning styles and different student populations. None of the Croatian students thought of their overall success was bad which is in great contrast to students from India and Nepal who seem to be more critical. In India, the students estimating their overall success as bad give higher grades to all subscales except 'Student-to-student interaction'. This could mean that they feel that other colleagues may be impeding their educational development in a way that they are competitive and avoid sharing experiences regarding their learning and studies. Furthermore, Croatian students who appraise their interest in the studies as excellent gave lower grades to 'Student-to-student interaction' and 'Emotional climate subscales'. It might be concluded that students who are less interested in the curriculum consider social aspects of their studies valuable. Conversely, in India, students who appraised their interest in the studies as excellent also graded their interaction with other students as very valuable. In Nepal, there was a correlation between high grading of DSLES subscales with the students' high interest in the curriculum, which was quite different from with their counterparts in India and Croatia (Figure?). In addition, they do not relate their 'Flexibility and Emotional climate' to their interest in the studies. This might also be attributed to the fact that the College is private, and not public.

It was quite unexpected that students in Croatia, who rated their school as good and not excellent, gave higher grades to almost all subscales. In contrast, students in India and Nepal who ranked their schools better usually gave better grades. Moreover, it is obvious that variable 'Meaningful experience' in all three countries can be highly associated with the perception of the school's quality including administration related factors, teaching methods and different kinds of student support.³³ The future research measuring faculty and staff perceptions of the learning environment could be used in further interpretation of these results. The survey follow up strategy is recording the changes in the curriculum and students' demographics during the next five years, and repeating the survey in a 5 year period in each country.

In conclusion, the findings of the current study showed a significant difference in dental students' grading of various DSLES scales in Croatia, India and Nepal. It was observed that with lack of flexibility, supportiveness and lecture based curriculum, there is considerable amount of space for the improvement of learning environments in the three academic settings.

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Conflict of Interest

None declared

Abstract

Aim: The aim of this study was to assess dental students' perception of different learning environment in India, Nepal and Croatia. **Methods:** The study was conducted during a period of academic year 2016/17. A total of 849 dental students participated in the study. There were 188 respondents from Croatia, 373 from India, and 288 from Nepal. Non-responders were not followed up. The Dental Student Learning Environment Survey (DSLES) was used which consisted of 55 items subdivided into seven scales. The scales measured the following perceptions: Flexibility, 'Student-to-Student Interactions, Emotional Climate, Supportiveness, Meaningful Experience, Organization and Breadth of Interest. Statistical analysis of the data utilised the Kolmogorov Smirnov test. The Kruskal-Wallis "non-parametric ANOVA" was also used to test the differences between the countries. A post hoc analysis was performed using Ranks tables and the Median test. **Results:** The response rate was 26.9%. Significant differences between the countries were found for all DSLES variables (Kruskal-Wallis, $p < 0.01$). The Median test also showed significant differences between the countries for all DSLES variables ($p < 0.01$). The scales with the highest mean values were 'Student-to-student interactions' in India and Nepal, and the 'Emotional Climate' in Croatia. **Conclusions:** Students in Croatia rated their school only with grades excellent and good, while their colleagues in India and Nepal were more critical. Despite the different settings in three countries, 'Flexibility' was identified as the area of weakness in all three educational systems.

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Key words

Curriculum; Dental Education, Graduate; Dental Students; Learning; Surveys and Questionnaires

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