

# Comparison of Preclinical Coursework Perception Among Dental Students from India and the Republic of North Macedonia

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## Abstract

**Background.** The difference in the preclinical curriculum and teaching methodology between European and Southeast Asian countries has a great influence on the process of choosing which education model is predominant and, therefore, students' opinion on the effectiveness of a preclinical coursework is diverse.

The **objective** of the research was to assess the perception of the preclinical coursework in prosthodontics, conservative dentistry, and endodontics among Indian and North Macedonian students.

**Materials and Methods.** This cross-sectional comparative study was carried out among 3<sup>rd</sup>-year students, final-year students and interns of dental schools of two respective countries. The data were collected in July 2021 using Google Form, a link to which was sent via available social media platforms. The data obtained were analyzed using SPSSv.21.0 (IBM) software.

**Results.** The data on dental students' perception of the preclinical coursework were obtained, analyzed, compared, and discussed. A total of 50% of Indian students stated preclinical exercises to be good to get knowledge about treating patients, whereas 47% of North Macedonian students felt the average level of knowledge needed for treating patient.

**Conclusions.** In this study, the majority of the students were in favor of attending the preclinical course and understood its importance for building up their confidence, better understanding of the subject and better patient handling in future dental practice. However, there were different students' opinions on the course content, its duration, exercises, faculty interaction, helpfulness of theory lectures that evidence essentiality to view dental studies from a student-centered perspective.

## Keywords

Dental Education; Preclinical Course; Student Perception

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## Introduction

Dental education is considered as a complex, challenging and often stressful educational procedure. The acquisition of psychomotor skills by undergraduate students is an important step to become a successful professional in many health professions, especially dentistry. Before performing

invasive and/or irreversible procedures, it is essential that dental students, during their preclinical laboratory projects, learn essential psychomotor skills through various teaching strategies to meet patient needs, either aesthetic or functional [1].

The subjects such as prosthodontics, conservative den-

tistry and endodontics have a thorough preclinical coursework which starts in the preclinical simulation laboratory, where students are equipped with an appropriate level of skills to apply when treating patients and offers a superior learning experience in their clinics. The main objective of the preclinical coursework is to offer students the opportunity of putting theory into practice. The faculty members are expected to ensure that all students develop a suitable level of understanding and dexterity to be successfully applied when treating patients in the dental clinic [2].

Any institute can assist in the creation of a world-class dentist with a strong ethical value system by studying the best practices regarding the curriculum, instructional methodologies, and cutting-edge technologies adopted by dental institutes throughout the world. This is a proactive approach to betterment [3].

Dental students' perspectives on the structure and content of their dental education experience are an important part of an evaluation of the curriculum [1]. Despite that, it is stated that student's perspectives on their education are generally undocumented in the literature, especially in the preclinical domain. According to some sources, dental students were not satisfied with their education [4], while according to the other studies, students provided positive feedback about their experiences in dental schools in the form of anecdotal reports [1]. Therefore, negative perceptions that might have unexpected consequences on students' performances throughout their dental educations and their total satisfaction with dentistry may remain unnoticed.

Different scholastic and professional developments within the field of dentistry create various norms and practices regarding dental diseases and their appropriate treatment. The difference in the preclinical curriculum and teaching methodology between European and Southeast Asian countries has a great influence on the process of choosing which education model is predominant and, therefore, students' opinion on the effectiveness of the preclinical coursework differs as well [3]. It will help in assessing the difference between the two realms.

Thus, **the objective of the research** was to gain knowledge of the perception of the preclinical coursework in prosthodontics, conservative dentistry, and endodontics among Indian and Macedonian dental students.

## Materials and Methods

### Study Design

This cross-sectional comparative study was carried out among 3<sup>rd</sup>-year students, final year students and interns using convenience sampling of the Faculty of Dental Medicine, Saints Cyril and Methodius University, Skopje, the Republic of North Macedonia and Surendera Dental College and Research Institute, Rajasthan, India. The data were collected in July 2021 using Google forms, a link to which was sent to students enrolled in the respective institutions via available social media platforms.

### Preclinical Coursework Description

The comparison of preclinical subjects at the Faculty of Dental Medicine, Saints Cyril and Methodius University, Skopje, the Republic of North Macedonia and Surendera Dental College and Research Institute, Rajasthan, India are highlighted in Table 1.

The preclinical conservative course starts in both countries during the second and third years, respectively. There are certain hours of time allotted for lectures, practical and homework assignments plus other activities. The method of assessing students differs in both countries; in India, the total grade (100 points) consists of practical skills (60 points), internal assessment (20 points) and viva voce (50 points), whereas in Macedonia, the total grade (85 points) includes activity (15 points), lectures (20 points) and oral answer (50 points). The course content is almost the same, with some basic practical exercises being taught to students in the initial classes. In India, preclinical prosthodontics is included in the first- and second-year curriculum, whereas in Macedonia, it is included in the second-year curriculum only. There are more lecture hours for theory classes in Macedonia (30 hrs) as compared to India, whereas more practical hours are observed in India (200 hrs). The assessment method is the same as for other preclinical subjects mentioned earlier. In both countries, the emphasis is on practical exercises rather than theoretical ones. Preclinical endodontics is a part of the final-year curriculum with some basics of endodontic procedures as a part of practical exercises and training.

### Survey Instrument and Data Collection

The survey instrument consisted of 9 pre-tested [4] and close-ended items, with every question having 3 answers, regarding students' thoughts on the adequacy of knowledge they received during preclinical training and stress levels they experienced during preclinical courses in prosthodontics, conservative dentistry, and endodontics. The items were focused on students' perceptions of their competence in terms of manual skills and clinical practice. The questions ranged from assessing the content and duration of preclinical exercises, the level of stress experienced by students, the interaction between students performing preclinical exercises and teachers to assessing the effectiveness of theoretical lectures and demonstrations in performing the treatment of patients. A text field for students' opinion and suggestions for the improvement of the preclinical courses in restorative dentistry was included for further updating and improving the coursework as well.

Students were informed regarding the need to study the topic of the research and were asked to participate in the study anonymously. They were instructed that completing and returning the survey were not mandatory and the process had no association with grading before completing the survey forms. The request for participation in the research was sent to 185 North Macedonian students and 259 Indian students. The forms, that were not completed and returned, were excluded from the study. After applying the exclusion criteria, 117 North Macedonian students and 196 Indian students completed the form and were selected to participate in the study.

**Table 1.** Comparison of preclinical course content between India and North Macedonia.

Preclinical Conservative Dentistry		
	India	North Macedonia
Year/term	2 <sup>nd</sup> -year BDS	3 <sup>rd</sup> -year MDM, term VI
Lecture hours	25	30
Preclinical practical hours	200	105
Method of assessment	<p>Total grade – 100 points:</p> <ul style="list-style-type: none"> <li>• practical skills – 60 points;</li> <li>• internal assessment – 20 points;</li> <li>• viva voice – 20 points.</li> </ul> <p>Practical and viva voice examinations. Examination is taken at the end of the academic year; the minimum passing grade is 50%.</p>	<p>Total grade – 85 points :</p> <ul style="list-style-type: none"> <li>• activity and participation in lectures and exercises – 15 points;</li> <li>• seminars/project (presentation: written and oral) – 20 points (5 lectures and lecture activities, 15 exercises);</li> <li>• final (oral) exam – 50 points.</li> </ul>
Practical exercises	<ul style="list-style-type: none"> <li>• Identification and study of hand cutting instruments, chisels, gingival margin trimmers, excavators, and hatchets.</li> <li>• Identification and use of rotary cutting instruments in contra-angle handpiece burs (micromotor).</li> <li>• Preparation of Class I, extended Class I, Class II MODs, and Class V amounting to 10 exercises in plaster models, 10 exercises in mounted extracted teeth of Class I cavity, 4 exercises in extended Class I cavity, 4 exercises in Class II cavity, 2 exercises in Class V cavity.</li> <li>• Cavity preparation base application matrix and wedge placement restoration with amalgam.</li> <li>• Exercises on phantom head models which includes cavity preparation base, varnish application matrix and wedge placement followed by amalgam restoration.</li> <li>• Class I.</li> <li>• Class I with extension.</li> <li>• Class II cavity.</li> <li>• Class II MODs.</li> <li>• Class V and III glass ionomer restoration.</li> <li>• Class V amalgam restoration.</li> <li>• Polishing the abovementioned restorations.</li> <li>• Demonstration of Class III and Class V cavity preparations.</li> <li>• Completing the restoration for composites on the extracted tooth.</li> <li>• Polishing and finishing the restoration of composites.</li> <li>• Identification and manipulation of varnish bases like zinc phosphate, poly carboxylate, glass ionomers, zinc oxide, eugenol cements.</li> <li>• Identification and manipulation of various matrices, tooth separators and materials like composites and modified glass ionomer cements.</li> <li>• Cast restoration.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration of the dentist's workplace, the functions of the apparatus, the position of the dentist, hand instruments.</li> <li>• General Black Principles. Making Class I Black on acrylic models.</li> <li>• Making Class V and Class II after Black.</li> <li>• Preparation of MOD gypsum model.</li> <li>• Preparation of Class III and Class IV gypsum model.</li> <li>• Preparation of atypical caries and of adhesive materials.</li> <li>• Preparation of Class I and Class V after Black on phantom models.</li> <li>• Preparation of Class II and MOD of phantom models.</li> <li>• Preparation of Class III and Class IV of phantom models.</li> <li>• Laying phosphate substrates.</li> <li>• Placement of matrices and restoration of the posterior teeth.</li> <li>• Restoration of the anterior teeth.</li> <li>• Therapy of caries profunda, means for temporary closure of cavities.</li> </ul>

Preclinical Prosthodontics		
	India	North Macedonia
Year/term	1 <sup>st</sup> -year BDS, 2 <sup>nd</sup> -year BDS	2 <sup>nd</sup> -year MDM, term III and IV
Lecture hours	25	30
Preclinical practical hours	200	90
Method of assessment	<p>Total grade – 100 points:</p> <ul style="list-style-type: none"> <li>• practical skills – 60 points;</li> <li>• internal assessment – 20 points;</li> <li>• viva voice – 20 points.</li> </ul> <p>No exam is taken during the first year of study, practical exam is conducted during the second year of study; the minimum passing grade is 50%.</p> <p>Practical and viva voice examination are taken only during the second year of study.</p>	<p>Total grade – 100 points:</p> <ul style="list-style-type: none"> <li>• tests – 30 points;</li> <li>• activity and participation in lectures and exercises; seminars/project (presentation: written and oral) – 10 points;</li> <li>• final (oral) exam – 60 points.</li> </ul>
Practical exercises	<ul style="list-style-type: none"> <li>• Impression on dye by impression compound. Fabrication of base plate.</li> <li>• POP cubes and cylinder.</li> <li>• Fabrication of acrylic plates on dental cast.</li> <li>• Formation of rim articulation.</li> <li>• Teeth setting on the rim.</li> <li>• Class I arrangement.</li> <li>• Class II arrangement.</li> <li>• Class III arrangement.</li> <li>• Denture curing.</li> <li>• Finishing and polishing the denture.</li> </ul>	<ul style="list-style-type: none"> <li>• Morphological and functional changes in the masticatory organ in edentulism, complete denture bearing.</li> <li>• Complete denture retention.</li> <li>• Making imprints from toothless jaws, preliminary (anatomical) imprint and obtaining working models.</li> <li>• Preparation of models and making types of individual spoons.</li> <li>• Functional prints and their spill, obtaining definite models.</li> <li>• Bite templates (base and wax wall) and their function in making complete prostheses.</li> <li>• Reconstruction of interdental relationships in edentulous patients (orientation prosthetic plane, vertical dimension, central relation – determination methods.)</li> <li>• Lower jaw movements and articulators.</li> <li>• Ways of transferring models in an articulator.</li> <li>• Choosing the teeth.</li> <li>• Methods for positioning the teeth in complete dentures.</li> <li>• Final laboratory procedures.</li> <li>• Repair of complete dentures.</li> <li>• Immediate prosthesis colloquium</li> <li>• Imprints in partial prosthesis.</li> <li>• Component parts of flat partial dentures.</li> <li>• Component parts of skeletal partial dentures.</li> <li>• Technical procedures in the production of partial dentures.</li> </ul>
Preclinical Endodontics		
	India	North Macedonia
Year/term	4 <sup>th</sup> -year students	4 <sup>th</sup> -year students, term VIII
Lecture hours	25	30
Preclinical practical hours	100	90
Method of assessment	<p>Total grade – 100 points:</p> <ul style="list-style-type: none"> <li>• practical skills – 60 points,</li> <li>• internal assessment – 20 points,</li> <li>• viva voice – 20 points.</li> </ul> <p>Practical and viva voice examinations. Examination is taken at the end of the academic year; the minimum passing grade is 50%.</p>	<p>Total grade – 85 points:</p> <ul style="list-style-type: none"> <li>• activity and participation in lectures and exercises – 15 points;</li> <li>• seminars/project (presentation: written and oral) – 20 points (5 lectures and lecture activities, 15 exercises);</li> <li>• final (oral) exam – 50 points.</li> </ul>

Practical exercises	<ul style="list-style-type: none"> <li>• Identification of basic endodontic instruments.</li> <li>• Coronal access cavity preparation on the extracted upper central incisors.</li> <li>• Determination of working length.</li> <li>• Biomechanical preparation of root canal space of the central incisor.</li> <li>• Obturation of root canal spaces. Absence of coronal access cavity.</li> <li>• Closure of access cavity.</li> </ul>	<ul style="list-style-type: none"> <li>• Endodontic therapy plan, basic stages of work in the endodontic procedure and morphological analysis of tooth root canals.</li> <li>• Introduction to the design and dynamics of working with hand endodontic instruments.</li> <li>• Odontometry – a technique for determining the working length of the root canal and X-ray of the tooth with an instrument in the canal. Electrodontometry.</li> <li>• Techniques and methods of root canal preparation with hand instruments (Step-Back, Crown-Down) on acrylic models (single-root and multi-root teeth.)</li> <li>• Medications and methods of application in the root canal.</li> <li>• Root canal obturation goal and tasks (pattern obturation technique and extracted teeth.)</li> <li>• Bio-pulpectomy technique and way of working, indications and means.</li> <li>• Mortal technique and way of working, indications and means.</li> <li>• Application of new methods and materials in endodontic therapy.</li> </ul>
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Notes: BDS – Bachelor of Dental Surgery; MDM – Doctor of Dental Medicine; MOD – mesial-occlusal-distal.

### Statistical Analysis

The data were analyzed using SPSSv.21.0 (IBM) software. Descriptive and inferential statistics were used to assess general characteristics of the data and to identify differences among students' scores year-wise and between the two countries. The Chi-square test for comparing the frequency data was used to determine if statistically significant differences existed.

### Results

The response rates of dental students from India and North Macedonia were 68.05% and 55.71%, respectively. The year-wise statistics on the response rates among students in the two countries is shown in Table 2.

**Table 2.** Distribution of respondent students among the two countries.

Academic Year	N (%)
India	
Third-year BDS	61 (33.1)
Final year BDS	66 (33.7)
Interns	69 (35.2)
Total	196 (100)
The Republic of North Macedonia	
Third-year MDM	42 (35.9)
Final Year MDM	39 (33.3)
Interns	36 (30.8)
Total	117 (100)

Among North Macedonian students, 38.5% of individuals reported good content of preclinical exercises, whereas 48.5% of Indian students stated the content of preclinical

exercises as average and only 39.3% of students reported the content of preclinical exercise to be good (Table 3). The responses related to stress experienced during preclinical exercises showed that Indian students felt more stress than North Macedonian students. Seventy-four per cent of Indian students and 51.3% of North Macedonian students stated sufficient duration of preclinical exercises; 52.6% of Indian students stated the average level of interaction with faculty members, whereas in North Macedonia, 40.2% of students reported a good level of interaction. A total of 51% of Indian students stated preclinical exercises to be good to get knowledge about treating patients, whereas 47% of North Macedonian students felt the average level of knowledge needed for treating patient.

Table 4 describes the cross-country comparison of students' responses regarding their viewpoint on the preclinical coursework. Among students who stated a good level of content, there were 51.1% and 45.5% of third-year students from North Macedonia and India, respectively; 41.9% and 50% of final year students from North Macedonia and India, respectively, reported it to be below average; 39% and 51.6% of North Macedonian and Indian interns stated the average content of preclinical exercises. When comparing the responses to the questions within the countries, both countries illustrated statistically significant results, except for opinion on the duration of preclinical exercises among Indian students; among North Macedonian students, there was no statistically significant difference in responses related to adequate interaction about preclinical exercises with the faculty members and helpfulness of the knowledge they are getting from theory lectures in preclinical exercises and clinical skills.



**Table 3.** Cross-country comparison of students' responses towards their perception of preclinical exercises.

Question	India N (%)	North Macedonia N (%)	p-value
<b>What do you think about the content of preclinical exercises?</b>			
Below average	24 (12.2)	31 (26.5)	0.002276*
Average	95 (48.5)	41 (35.0)	0.02776*
Good	77 (39.3)	45 (38.5)	0.9802
<b>Kindly rate the stress level during preclinical exercises.</b>			
Very stressful	38 (19.4)	5 (4.3)	0.0003327*
Stressful	103 (52.6)	43 (36.8)	0.009497*
Not stressful	55 (28.0)	69 (58.9)	<0.0001*
<b>What do you think about the duration of preclinical exercises?</b>			
Too long	30 (15.3)	3 (2.6)	0.0007762*
Sufficient duration	145 (74.0)	60 (51.3)	<0.0001*
Too short	21 (10.7)	54 (46.1)	<0.0001*
<b>Do you feel that you have an adequate interaction about preclinical exercises with the faculty staff?</b>			
Below average	22 (11.2)	30 (25.6)	0.001586*
Average	103 (52.6)	40 (34.2)	0.002381*
Good	71 (36.2)	47 (40.2)	0.5643
<b>Do you think that the knowledge you are getting from theory lectures is helpful in preclinical exercises?</b>			
Below average	23 (11.7)	12 (10.3)	0.8289
Average	96 (49.0)	51 (43.6)	0.4195
Good	77 (39.3)	54 (46.1)	0.2831
<b>Do you think that the knowledge you are getting from theory lectures is helpful in clinical skills?</b>			
Below average	18 (9.2)	24 (20.5)	0.007504*
Average	113 (57.6)	48 (41.0)	0.006319*
Good	65 (33.2)	45 (38.5)	0.4079
<b>Do you think that preclinical exercise is helpful to you in treating patients?</b>			
Below average	21 (10.7)	27 (23.1)	0.005527*
Average	75 (38.3)	55 (47.0)	0.1615
Good	100 (51.0)	35 (27.9)	0.0004159*
<b>Are the demonstrations given by the teacher helpful in preclinical exercise?</b>			
Below average	27 (13.8)	40 (34.2)	<0.0001*
Average	75 (38.3)	36 (30.8)	0.2228
Good	94 (47.9)	41 (35.0)	0.03448*
<b>What do you think about the facilities provided to you during your preclinical exercise?</b>			
Below average	49 (25.0)	32 (27.4)	0.7444
Average	92 (46.9)	53 (45.3)	0.8695
Good	55 (28.1)	32 (27.3)	0.9957

Notes: \*statistically significant < 0.05.

## Discussion

Nowadays there is an increasing awareness that in modifying the educational procedure learners' views on their educational experiences and responses are a crucial entity. Therefore, surveys as the methods of quantitative data collection have been widely initiated to assess dental students' perspectives on the effectiveness of various courses [5]. For training undergraduate students, the development of operative skills in a preclinical setting is very important. This study aimed to explore and compare dental students' views regarding the reasons and advantages of attending the preclinical courses in conservative dentistry, endodontics and prosthodontics, the learning environment, course content, quality of teaching, learning facilities and educational resources used by students from the Republic of North Macedonia and India. Students' opinions and suggestions were

taken into consideration as well. The rationale underlying the comparison was that it would provide the insights on the gaps that exist in the thinking process of students of Western countries and the Southeast Asian region.

In the current study, 35% of students from North Macedonia and 48.5% of students from India reported the average content of preclinical exercises. These results are similar to the studies conducted by Curtis *et al.* [6] and Nunez *et al.* [7]; the studies have reported that preclinical training is not an accurate indicator of clinical success.

The present study showed that Indian students felt more stressful during preclinical exercises than students from North Macedonia. A study carried out by Gul *et al.* showed similar results with Indian students: 63.8% of students thought that the environment was conducive to learning. The working environment must be optimal to get the best

**Table 4.** Cross-country comparison of students' responses towards their perception of preclinical exercises.

Question	North Macedonia			p-value	India			p-value
	Third-year students	Final year students	Interns		Third-year students	Final year students	Interns	
	N (%)	N (%)	N (%)		N (%)	N (%)	N (%)	
<b>What do you think about the content of preclinical exercises?</b>								
Below average	6 (19.4)	13 (41.9)	12 (38.7)	0.034*	6 (25.0)	12 (50.0)	6 (25.0)	0.0001*
Average	13 (31.7)	12 (29.3)	16 (39.0)		20 (21.0)	26 (27.4)	49 (51.6)	
Good	23 (51.1)	14 (31.1)	8 (17.8)		35 (45.5)	28 (36.4)	14 (18.1)	
<b>Kindly rate the stress level during preclinical exercises.</b>								
Very stressful	30 (43.5)	21 (30.4)	18 (26.1)	0.006*	5 (13.2)	22 (57.9)	11 (28.9)	0.0001*
Stressful	12 (27.9)	13 (30.2)	18 (41.9)		32 (31.1)	25 (24.3)	46 (44.6)	
Not stressful	0	5 (100)	0		24 (43.6)	19 (34.6)	12 (21.8)	
<b>What do you think about the duration of preclinical exercises?</b>								
Too long	0	2 (66.7)	1 (33.3)	0.112	7 (23.3)	15 (50.0)	8 (26.7)	0.094
Sufficient duration	28 (46.6)	16 (26.7)	16 (26.7)		44 (30.3)	48 (33.1)	53 (36.6)	
Too short	14 (25.9)	21 (38.9)	19 (35.2)		10 (47.6)	3 (14.3)	8 (38.1)	
<b>Do you feel that you have an adequate interaction about preclinical exercises with the faculty staff?</b>								
Below average	11 (36.7)	12 (40.0)	7 (23.3)	0.94	5 (22.7)	4 (18.2)	13 (59.1)	0.001*
Average	12 (30.0)	18 (45.0)	10 (25.0)		24 (23.3)	37 (35.9)	42 (40.8)	
Good	19 (40.4)	9 (19.2)	19 (40.4)		32 (45.1)	25 (35.2)	14 (19.7)	
<b>Do you think that the knowledge you are getting from theory lectures is helpful in preclinical exercises?</b>								
Below average	6 (50.0)	6 (50.0)	0	0.037	3 (13.1)	11 (47.8)	9 (39.1)	0.0001*
Average	15 (29.4)	21 (41.2)	15 (29.4)		15 (15.6)	33 (34.4)	48 (50.0)	
Good	21 (38.9)	12 (22.2)	21 (38.9)		43 (55.8)	22 (28.6)	12 (15.6)	
<b>Do you think that the knowledge you are getting from theory lectures is helpful in clinical skills?</b>								
Below average	11 (45.8)	8 (33.4)	5 (20.8)	0.136	2 (11.1)	7 (38.9)	9 (50.0)	0.0001*
Average	11 (22.9)	20 (41.7)	17 (35.4)		25 (22.1)	43 (38.1)	45 (39.8)	
Good	20 (44.4)	11 (24.4)	14 (31.2)		34 (52.3)	16 (24.6)	15 (23.1)	
<b>Do you think that preclinical exercise is helpful to you in treating patients?</b>								
Below average	5 (18.6)	11 (40.7)	11 (40.7)	0.0001*	4 (19.0)	8 (38.1)	9 (42.9)	0.0001*
Average	33 (60)	13 (23.6)	9 (16.4)		14 (18.7)	22 (29.3)	39 (52.0)	
Good	4 (11.4)	15 (42.9)	16 (45.7)		43 (43.0)	36 (36.0)	21 (21.0)	
<b>Are the demonstrations given by the teacher helpful in preclinical exercise?</b>								
Below average	23 (57.5)	7 (17.5)	10 (25.0)	0.007*	4 (14.8)	9 (33.3)	14 (51.9)	0.0001*
Average	8 (22.2)	17 (47.2)	11 (30.6)		12 (16.0)	27 (36.0)	36 (48.0)	
Good	11 (26.8)	15 (36.6)	15 (36.6)		45 (47.9)	30 (31.9)	19 (20.2)	
<b>What do you think about the facilities provided to you during your preclinical exercise?</b>								
Below average	5 (15.6)	12 (37.5)	15 (46.9)	0.001*	6 (12.3)	18 (36.7)	25 (51)	0.0001*
Average	28 (52.8)	18 (34.0)	7 (13.2)		20 (21.7)	35 (38.0)	37 (40.3)	
Good	9 (28.1)	9 (28.1)	14 (43.8)		35 (63.6)	13 (23.6)	7 (12.8)	

Notes: \*statistically significant < 0.05.

out of anyone, whether a teacher or a student. If it is pleasant, the result is going to be better than in case the environment is stressful or not so pleasant [8]. Among dental students, the experience of severe anxiety and stress is well recognized. Stress-related symptoms reported by students range from mild anxiety to eating and sleep disorders, as well as poor performance, lack of ability to concentrate, aggression, sadness, and other devastating effects. Commonly reported sources of stress include academic overload [9–11].

In the current survey, North Macedonian and Indian students reported the sufficient duration of the preclinical course. These results are dissimilar to a study conducted by

Ayra *et al.*, according to which, nearly one in three students reported the short duration of the preclinical course, although three hours were allocated to the preclinical course every week. This demand for a long preclinical course may indicate a high motivation of students.

In the present study, 51% of Indian students and only 47% of North Macedonian students stated that attending the preclinical course would be helpful in treating patients. These results are dissimilar to a study conducted by Gul *et al.* in which more than 80% of students stated that the course would help in better understanding of the subject; the reason behind this could be the preclinical course itself that really helps students better correlate their theoret-

ical knowledge with clinical application and this integration increases students' interest in the subject and at the same time helps in better understanding of the subject. A study conducted by Bianca *et al.* also suggested that preclinical training on the typodont and in the classroom was associated with clinical performance [12].

In the current study, the demonstrations given by educators to students from India and North Macedonia were shown to be very helpful. These results are similar to a study involving students enrolled in Biruni University: most students found the demonstrations helpful or very helpful in understanding preclinical and clinical knowledge and skills. This could be since preclinical courses increase students' cognitive abilities, thereby helping in the improvement of their psychomotor skills and increasing students' readiness for clinic practice in the nearest future [4].

Nikolovska *et al.* in their study conducted in 2014 and 2015 with dental students from three countries – Croatia, North Macedonia, and Albania, wanted to compare the factors motivating students to study dentistry and to assess whether their motivation has changed during the study. Students from Zagreb had the largest positive image of the profession; however, among dental students from Skopje, it decreased from the first to the last year of study. In their research, significant differences were found between the responses of third-year students and final year students from the three faculties. In Croatia, which is a member of the European Union, 97% of final year students had a positive attitude towards the profession, while in Skopje, students' expectations were not met, as 33.9% of students were ready to change their profession and 64.5% of students lost their motivation to study [13].

The Covid 19 pandemic has certainly had a huge impact on the entire educational process in the world, forcing many universities to shift traditional lecture-based learning to team-based learning [14, 15].

The present survey would be the first research regarding the perception of the preclinical courses in dentistry among dental students of the two countries, North Macedonia and India, and their comparison. Obtaining information on how dental students perceive their readiness and the level of stress during preclinical courses prior to delivering patient care in the clinic would lead to the preclinical curriculum in dentistry.

## Conclusions

It is important to understand that education is much more than gaining knowledge or training. The current study has illustrated the viewpoints of dental students of the two countries on the preclinical courses. The differences in opinions can be accounted on different coursework and approaches but it is evident from the responses of dental students from both countries that it is essential to view dental studies from a student-centered perspective. In this study, most students were in favor of attending the preclinical course and understood its importance for building up their confidence, better understanding of the subject and patient handling in future dental practice. There should be

a structured manual for the preclinical course and a specially trained separate teaching staff should be appointed so that the students receive enough attention for their stress and queries.

## Ethical Statement & Informed Consent

Ethical clearance was taken from the Ethical Committee of Surendera Dental College and Research Institute, Rajasthan, India and the Faculty of Dental Medicine, Saints Cyril and Methodius University, Skopje, the Republic of North Macedonia. Informed consent was obtained from the participants as they were briefed about the objective of the study; their participation was voluntary, and the questionnaire was anonymous to keep the personal information confidential.

## Conflict of Interest

The authors declare that no conflicts exist.

## Financial Disclosure

The authors declared no financial support.

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**Received:** 2021-09-16

**Revision Requested:** 2021-10-25

**Revision Received:** 2021-11-03

**Accepted:** 2021-11-07