

Innovations

Leveraging You Tube as a learning tool for Periodontal Procedures

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Abstract:

Background: Periodontics, a crucial branch of dentistry, demands a profound understanding to master the treatment of conditions affecting oral tissues. The digital era has transformed learning, with YouTube emerging as a pivotal platform for educational resources. However, concerns persist regarding the source and reliability of dental educational content on YouTube. This study explores YouTube efficacy in enhancing periodontal procedure learning among dental students. **Materials and methods:** A survey was conducted among dental undergraduates to assess YouTube utilization for periodontology learning. Questions gauged YouTube usage patterns, its impact on knowledge retention and examination scores, faculty recommendations. **Results:** Out of 250 respondents, a significant majority (99.2%) used YouTube, with 89.2% leveraging it for periodontal learning. Females (67.6%)

and third year students (38.4%) exhibited higher utilization rates. YouTube positively impacted familiarity with instruments, diagnostic understanding, and nonsurgical procedures. Notably, 73.2% of participants relied on faculty recommendations to use YouTube. **Discussion:** Comparisons with prior studies underscored dental students' reliance on YouTube for clinical learning, aligning with broader trends in health education. Visual aids on YouTube aided comprehension of abstract concepts and diversified clinical approaches. Faculty endorsement significantly influenced students' adoption of YouTube for educational purposes. **Conclusion:** The study reveals YouTube's widespread use among dental students for periodontal education. It emphasizes the platform's potential to supplement traditional teaching methods, especially in visualizing complex concepts. Recommendations include integrating YouTube – based learning strategies into dental curricula to enhance comprehension and clinical preparedness. However, caution is warranted in assessing content quality and ensuring guidance from experienced mentors.

Key-Words: YouTube, dental education, Periodontology, e-learning, social media, dental undergraduates.

Introduction:

Periodontics is the branch of dentistry that focuses on identifying and treating conditions affecting the tissues that support and surround teeth. Learning about it provides knowledge of bone conditions, diseases of the mouth that are related to general health, and the upkeep of good dental hygiene. One will never be able to master the disease process in the patient without having solid information and comprehension of the subject.¹

The digital age has transformed the way we access information and acquire new skills. One platform that has revolutionized learning is YouTube, which has become a valuable resource for students and professionals in various fields. Over the past few decades, there have been changes in dentistry education due to a shift in the learning styles of dental students, an ageing cohort, and an increased demand for the integration of technological teaching methods. Given that the current dental student body is primarily composed of millennials. "Using electronic technologies to access educational curriculum outside of the traditional classroom" is the definition of e-learning. One of e-learning's advantages is that clinical procedures are shown visually. Nonetheless, it's possible that a large portion of the online e-learning material was not produced by dental educators or licensed dentists.²

In the realm of dentistry, particularly in periodontics, YouTube has proven to be an invaluable tool for learning and improving clinical skills related to periodontal procedures. In this article, we will explore the ways in which YouTube can be harnessed as an effective learning tool for periodontal procedures.

The term "computer assisted learning" (CAL) has gained importance over the past ten years. It uses text, 2D and 3D images, video, music, animation, and individual interactions to lead the learner through an interactive document.³ Social media platforms are ubiquitously used for scholarly and recreational purposes, which help people boost their clinical and academic abilities as they have evolved into venues for flexible and collaborative learning.^{4,5}

Youtube videos available on the internet includes theoretical and clinically focused demos of ultrasonic and hand scaling, lasers, implants and suturing techniques, recorded lectures and patient education. In contrast against standard lectures alone, watching YouTube videos alongside learning from textbooks collectively enhanced students' comprehension levels.⁴

Moreover, because there are relatively few opportunities for students to learn anatomical concepts, they rely on social media for engaging and creative content for education. The ratio of pedagogical and andragogical learning traits exhibited among undergraduate students with distinctive cognitive, hormonal, and social characteristics varies, despite the fact that they are technically deemed adults.^{6,7} Numerous international studies on dentistry and medical education have found that YouTube is the digital source that health-professional students use the most.⁷⁻¹⁰

This study is designed to know the prevalence of using YouTube in learning Periodontology among dental undergraduates. An additional objective was done to identify the impact created by the participant's gender. Furthermore, there is no information accessible regarding the use of social media sites by Indian undergraduates learning periodontology. This survey seeks to assess how social media is used by aspiring periodontists as a teaching and learning tool.

Subjects and methods:

We conducted a survey to evaluate the prevalence of YouTube utilization among dental undergraduates. An online questionnaire was formed on "Google forms" and distributed to third year, final year and Interns through social media platforms. These peers then forwarded the link to their batchmates so they could complete the questionnaire, and so forth. The survey links circulated were anonymous and adhered to the institution's particular codes of conduct. Reminder messages were sent every 3 days and no incentives were encouraged for participation.

A demographic section along with three other domains were prepared. Responses to every domain used a nominal scale (yes/no). The first domain consisted of 4 questions corresponded to YouTube usage in general: 1) Do you generally use YouTube, 2) Do you get your information from YouTube, 3) Do you use YouTube to help with your dental education, and 4) Do you utilize YouTube for periodontology learning resources. The second domain was used to evaluate YouTube as a periodontology study resource and included questions about periodontal instruments and instrumentation, normal periodontium, periodontal

diagnosis and treatment plan, nonsurgical treatment procedures like scaling, surgical procedures like gingivectomy, flap surgery, plastic and esthetic surgery and finally Implantology. The third domain was aimed to know if YouTube had helped them to memorize and recall periodontal information and to get higher marks in Periodontology exams. 2 questions were asked about the source who had advised them to watch YouTube and whether they would advise other students to use You Tube as a learning tool for Periodontology. Final questions were about their interest in watching 3D/live surgical procedures and in watching short/long lengthened videos. The link was set to obtain only 1 response per participant and all the questions were marked necessary. After completion of study period, data's were procured and imported using SPSS (Statistical Package for Social Sciences) software version 26.0 for statistical analysis.

Descriptive statistics was done to assess the frequency and percentage among the questionnaires recorded. An additional chi square test was done to assess the association between the gender and year of study with the questionnaire recorded.

Results:

Responses were collected from a total of 250 students among whom 96 were from third year, 81 from final year and 73 from Interns. Majority of students lie under 22 years (46.8%), followed by 23 years (25.2%), 21 years (20.8%), 24 years (4.4%), 20 years (2%) and finally 25 years (0.8%). The following table-1 and graph-1 shows the same.

Out of the total, 169 were females (67.6%) and 81(32.4%) were males {GRAPH 2}. 38.2% responses were from Third years, 34.2% from final years and only 29.2% from interns. Its represented in graph 3.

Discussion:

The present questionnaire survey consisted of responses aggregated from a total of 250 students out of whom 99.2% have agreed to been using You tube in general. 95.6% of the students use YouTube as a learning tool in dentistry and 89.2% utilize it to learn Periodontology specifically.

Almost 67.6% females have agreed to use YouTube in general and 66.4% use it to learn dentistry. This extensive use of social media mimics results in other studies of health professionals.¹¹

In a study by Min-Wen Fu et al¹²the majority, 96.7%, reported using YouTube as a learning tool for dental procedures and 83.3% to learn about endodontics, specifically. Our results show that a maximum of 95 students (38%) use YouTube to learn oral surgery followed by 49 students (19.6%) for periodontology and 32 students (12.8%) for Endodontics.

A multi-institutional study conducted by Lorel E. Burns² in 2020, suggest that third- and fourth-year dental students are very likely to use YouTube, and while learning may not be their main goal when using the site, it is very likely that

they will use it as a resource to learn and get ready for clinical dental procedures. Another research found that 79.1% of medical students used YouTube to learn anatomy, and many of them advocated the site for improving comprehension and memorization of the subject.¹³ Similarly, a study by AbeerAnjum et al¹ showed that medical students use YouTube mostly to study 'Gross Anatomy' whereas, Dental students use YouTube majorly to study 'Embryology'. These studies imply that the YouTube platform has a beneficial effect on health professional students' knowledge of the clinically oriented departments.

The results of our study are in line with previous research in which students pursuing health-related profession stated that YouTube improved their learning, with a range of 89% to 98%. These findings also represent the practices of millennial students.

Although pre-clinical dentistry is taught to students using models, PowerPoint, and a blackboard, this might mean that today's pupils need a more three-dimensional representation of their lectures. Since some are devoid of these facilities, they turn to YouTube as a source of learning. Information must be actively transferred from working memory to memories that last. As a result, the learner will be more capable to retain concepts in the long run. Superior quality visualizations and audio explanations can also help reduce unnecessary mental workload and increase relevant cognitive load.^{14,15}

According to our research, the majority of students used YouTube videos as a supplement to their official dentistry education. YouTube was mostly used to improve visualization and comprehension of abstract concepts and to discover various approaches to clinical procedure practices.

In the present survey, 73.2% participants use social media platforms on the recommendation of their faculty members. Additionally, it has been noted in earlier studies that professors from various institutions collaborate to share insights and evidence-based teaching strategies to benefit student learning,¹⁶ giving them the chance to obtain confident therapeutic approaches that they can employ in their regular practices.¹⁷

The use of internet-based platforms in the dental curriculum has been noted in several studies. International dental students have embraced and benefited from this practice. If prior to the lectures, students watched brief videos on YouTube that illustrated different approaches to education it will increase their interest in those classes by giving them outlines with introductory knowledge of the subject. This is supported by a study conducted by Batt-Rawden et al who had also concluded that though social media might make it easier to attain clinical excellence, more research is required.¹⁷

This study has a few drawbacks, chief among which being the size of the sample in terms of the number of participating schools and student responders. In addition, the type of evidence-based instruction dental students received before having access to video resources was not examined in our study, and this

instruction may have influenced the YouTube films chosen for instruction. Further investigation on this topic could be of interest.

Despite the study's limitations in sample size and scope. It underscores the imperative for integrating social media, particularly You Tube, into dental curricula. With its capacity for visual learning and extensive content repository, You Tube emerges as a powerful ally in fostering improved understanding skills, and knowledge in periodontics. However, prudent usage, critical content evaluation, mentor guidance remains pivotal in harnessing You Tube's potential for dental education.

Conclusion:

Based on the results of this survey, it appears that third year dental students frequently use YouTube as a learning tool for periodontology. A very minimum of students have reported that their faculty members have instructed to use YouTube as a source and that they would recommend such videos to their batchmates too. Finally, this study shows that pre-clinical and theoretical knowledge were well up taken when viewed through good quality, three dimensional visualizations rather than traditional methods of learning. Periodontology, being a vast subject requires good knowledge to confidently handle patients and manage them. Hence, new teaching methods using social media alongside textbook teaching must be incorporated in both undergraduate and postgraduate dental curriculum.

YouTube has undoubtedly emerged as powerful learning tool for periodontal procedures. Its accessibility, visual learning capabilities, and the wealth of content it offers make it an excellent resource for dental students and professionals. By harnessing You Tubes potential, individuals can enhance their understanding skills, and knowledge in the field of periodontics, ultimately providing better patient care and contributing to the advancement of dental practices. However, its essential to use this platform wisely, critically evaluating the quality of content and seeking guidance from experienced mentors when necessary. As technology continues to shape the world of education and professional development, You Tube remains a valuable ally for those in the field of periodontics.

Competing Interests: Authors have no conflict of interest to declare.

Funding: None

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Tables:

Table 1: Demographic Details of the Study Participants

AGE	FREQUENCY (N)	PERCENTAGE (%)
20 YEARS	5	2.0
21 YEARS	52	20.8
22 YEARS	117	46.8
23 YEARS	63	25.2
24 YEARS	11	4.4
25 YEARS	2	.8
GENDER		
FEMALE	169	67.6
MALE	81	32.4
YEAR OF STUDY		
III Year	96	38.4
IV Year	81	32.4
Intern	73	29.2

Table 1 shows the demographic details of the study participants. While assessing the age, higher number of study participants were around 22 years of age (46.8%). While assessing the gender, female was in higher number than males (67.6%). The study participants were found to have higher third year (38.4%) followed by final year (32.4%).

Table 2: Descriptive Statistics of the Questionnaire Recorded Among the Study Participants

S.NO	QUESTIONNAIRE	OPTIONS	FREQUENCY (N)	PERCENTAGE (%)
1.	Do you generally use YouTube?	NO	2	.8
		YES	248	99.2
2.	Do you get your information from YouTube?	NO	6	2.4
		YES	244	97.6
3.	Do you use YouTube to help with your dental education?	NO	11	4.4
		YES	239	95.6
4.	Do you utilise YouTube for periodontology learning resources?	NO	27	10.8
		YES	223	89.2
5.	Has using YouTube helped you with the familiarization of periodontal instruments and instrumentation?	NO	31	12.4
		YES	219	87.6
6.	Has using YouTube helped you to understand the normal periodontium, Periodontal diagnosis, prognosis and treatment plan?	NO	38	15.2
		YES	212	84.8
7.	Has using YouTube helped you to understand nonsurgical treatment procedures like scaling, Periodontal surgical procedures like Gingivectomy, flap surgery, plastic and esthetic surgery?	NO	31	12.4
		YES	219	87.6
8.	Has YouTube helped	NO	52	20.8

	you learn more about implantology?	YES	198	79.2
9.	Has YouTube helped you remember and recollect information about periodontal disease?	NO	42	16.8
		YES	208	83.2
10.	Has YouTube helped you get higher scores on your examinations related to periodontology?	NO	47	18.8
		YES	203	81.2
11.	Has any of the periodontics departments lecturers suggested that you use YouTube to understand periodontology?	NO	67	26.8
		YES	183	73.2
12.	Do you advise other students to study periodontology on YouTube?	NO	28	11.2
		YES	222	88.8
13.	Are you interested in watching 3D/ live surgical procedures?	NO	10	4.0
		YES	240	96.0
14.	Are you interested in watching short/long lengthened videos?	Long Length	26	10.4
		Short Length	224	89.6
15.	Among the available dental subjects which one you see often	All subjects	15	6
		Endodontics	32	12.8
		OMFS	95	38
		Oral medicine	8	3.2

	Oral pathology	4	1.6
	Oral Surgery	1	.4
	orthodontics	17	6.8
	Periodontology	49	19.6
	Prosthodontics	28	11.2
	public health dentistry	1	.4

The 15 close ended questionnaire clearly showed that you tube is found to be a source of knowledge and learning tool which helped the students to acquire more knowledge.

Table 3: Association of Gender with the Questionnaire Recorded

S.N O	QUESTION NAIRE	OPTIONS	FEMALE		MALE		P- valu e
			FREQUE NCY (N)	PERCEN TAGE (%)	FREQUE NCY (N)	PERCEN TAGE (%)	
1.	Do you generally use YouTube?	NO	0	0	2	0.8	0.104
		YES	169	67.6	79	31.6	
2.	Do you get your information from YouTube?	NO	0	0	6	2.4	0.001 *
		YES	169	67.6	75	30	
3.	Do you use YouTube to help with your dental education?	NO	3	1.2	8	3.2	0.006 *
		YES	166	66.4	73	29.2	
4.	Do you utilise YouTube for periodontology learning	NO	15	6	12	4.8	0.117
		YES	154	61.6	69	27.6	

	resources?						
5.	Has using YouTube helped you with the familiarization of periodontal instruments and instrumentation?	NO	18	7.2	13	5.2	0.157
		YES	151	60.4	68	27.2	
6.	Has using YouTube helped you to understand the normal periodontium, periodontal diagnosis, prognosis and treatment plan?	NO	22	8.8	16	6.4	0.116
		YES	147	58.8	65	26	
7.	Has using YouTube helped you to understand nonsurgical treatment procedures like scaling, Periodontal surgical procedures like	NO	12	4.8	19	7.6	<0.001*
		YES	157	62.8	62	24.8	

	Gingivectomy, flap surgery, plastic and esthetic surgery?						
8.	Has YouTube helped you learn more about implantology?	NO	32	12.8	20	8	0.188
		YES	137	54.8	61	24.4	
9.	Has YouTube helped you remember and recollect information about periodontal disease?	NO	18	7.2	24	9.6	<0.001*
		YES	151	60.4	57	22.8	
10.	Has YouTube helped you get higher scores on your examinations related to periodontology?	NO	25	10	22	8.8	0.016*
		YES	144	57.6	59	23.6	
11.	Has any of the	NO	43	17.2	24	9.6	0.290

	periodontics department lecturers suggested that you use YouTube to understand periodontology?	YES	126	50.4	57	22.8	
12.	Do you advise other students to study periodontology on YouTube?	NO	16	6.4	12	4.8	0.149
		YES	153	61.2	69	27.6	
13.	Are you interested in watching 3D/ live surgical procedures ?	NO	4	1.6	6	2.4	0.055
		YES	165	66	75	30	
14.	Are you interested in watching short/long lengthened videos?	Long Length	18	7.2	9	3.6	0.764
		Short Length	151	60.4	72	28.8	
15.	Among the available dental subjects which one you see often	All subjects	10	4	5	2	0.232
		Endodontics	24	9.6	8	3.2	
		OMFS	71	28.4	25	10	
		Oral medicine	3	1.2	5	2	

	Oral pathology	3	1.2	1	0.4
	orthodontics	11	5.2	6	2.4
	Periodontology	27	10.8	22	8.8
	Prosthodontics	19	7.6	9	3.6
	public health dentistry	1	0.4	0	0

P-value <0.05 was considered to be statistically significant. While assessing the association it was shown that statistically significant difference was seen in five questionnaires recorded among male and female.

Table 4: Association of Year of Study with the Questionnaire Recorded

S. No	Questionnaire	Options	Third Year		Final Year		Intern		P-value
			Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)	Frequency (N)	Percentage (%)	
1	Do you generally use YouTube ?	NO	0	0	1	0.4	1	0.4	0.531
		YES	96	38.4	80	32	72	28.8	
2	Do you get your information from YouTube ?	NO	0	0	4	1.6	2	0.8	0.099
		YES	96	38.4	77	30.8	71	28.4	
3	Do you use YouTube to help with your dental education?	NO	3	1.2	5	2	3	1.2	0.609
		YES	93	37.2	76	30.4	70	28	
4	Do you	NO	8	3.2	9	3.6	10	4	0.5

	use youtube to learn periodontology?	YES	88	35.2	72	28.8	63	25.2	35
5	Do you utilise YouTube for periodontology learning resources ?	NO	12	4.8	9	3.6	10	4	0.88
		YES	84	33.6	72	28.8	63	25.2	
6	Has using YouTube helped you with the familiarization of periodontal instruments and instrumentation?	NO	14	5.6	13	5.2	11	4.4	0.936
		YES	82	32.8	68	27.2	62	24.8	
7	Has using You Tube helped	NO	16	6.4	10	4	5	2	0.159

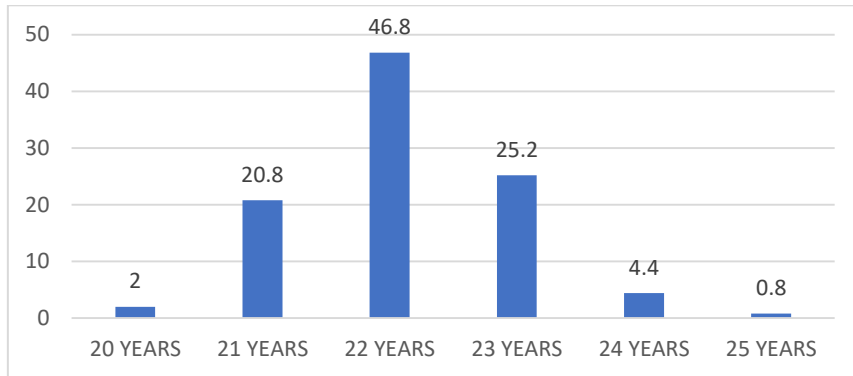
	you to understand the normal periodontium, periodontal diagnosis, prognosis and treatment plan?	YES	80	32	71	28.4	68	27.2	
8	Has YouTube helped you learn more about implantology?	NO	28	11.2	14	5.6	10	4	0.031*
		YES	68	27.2	67	26.8	63	25.2	
9	Has YouTube helped you remember and recollect information about periodontal disease?	NO	16	6.4	12	4.8	14	5.6	0.769
		YES	80	32	69	27.6	59	23.6	
10	Has YouTube helped you get higher	NO	22	8.8	11	4.4	14	5.6	0.284
		YES	74	29.6	70	28	59	23.6	

	scores on your examinations related to periodontology?								
11	Has any of the periodontics departments lecturers suggested that you use YouTube to understand periodontology?	NO	28	11.2	12	4.8	27	10.8	0.007*
		YES	68	27.2	69	27.6	46	18.4	
12	Do you advise other students to study periodontology on YouTube?	NO	11	4.4	9	3.6	8	3.2	0.994
		YES	85	34	72	28.8	65	26	
13	Are you interested in watching 3D/ live surgical procedures?	NO	4	1.6	4	1.6	2	0.8	0.629
		YES	92	36.8	1	0.4	71	28.4	

14	Are you interested in watching short/long lengthened videos?	Long Length	12	4.8	5	2	10	4	0.325
		Short Length	84	33.6	76	30.4	63	25.2	
15	Among the available dental subjects which one you see often	All subjects	5	2	6	2.4	4	1.6	0.001*
		Endodontics	23	9.2	4	1.6	5	2	
		OMFS	33	13.2	35	14	28	11.2	
		Oral medicine	6	2.4	0	0	2	0.8	
		Oral pathology	1	0.4	0	0	3	1.2	
		orthodontics	9	3.6	4	1.6	3	1.2	
		Periodontology	11	4.4	23	9.2	15	6	
		Prosthodontics	8	3.2	8	3.2	12	4.8	
		public health dentistry	0	0	0	0	1	0.4	

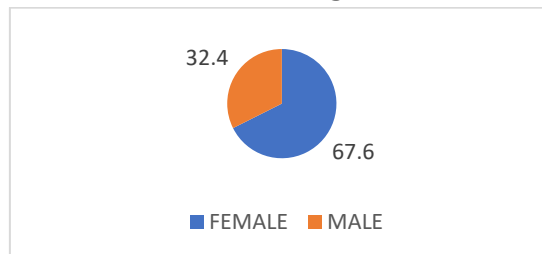
Statistically significant difference was seen in three questionnaires recorded among the third, final and intern.

Graph 1: Age Distribution among the Study Participants



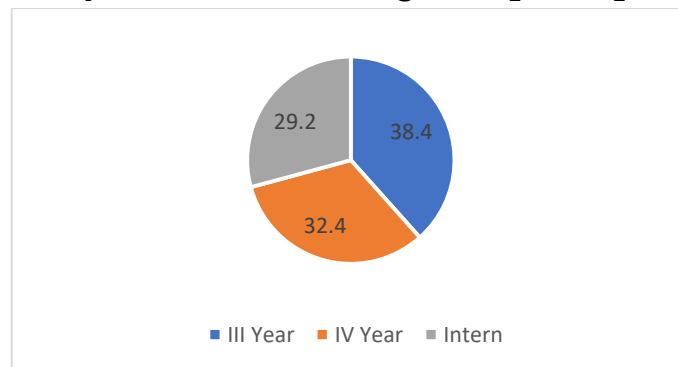
The graphical representation shows the higher percentage of participants were 22 years old age.

Graph 2: Year of Study Distribution among the Study Participants



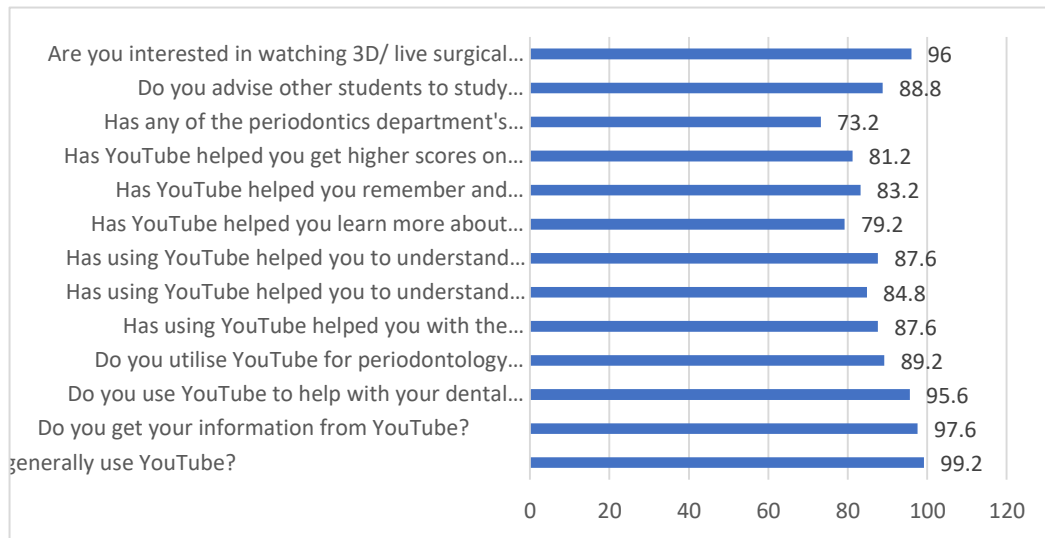
The graphical representation shows the higher percentage of participants were males.

Graph 3: Year of Study Distribution among the Stparticipants



The graphical representation shows the higher percentage of third year.

Graph 4: Percentage Distribution of Study Participants Who Agree with the Questionnaire Recorded



The graphical representation shows that higher participants used youtube in general followed by you used as a source of information.