A CHALLENGE IN ACQUIRING CORE ANATOMICAL CONCEPT IN MEDICAL SCIENCE TEACHING

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Abstract. Active learning is a relevant scholastic approach in medical science education. This involves motivation-related elements like worth, self-confidence, and being connected in addition to learners' contentment and beliefs regarding performance. The study's goal is to present benefit of varied educational activities that promote educational experiences. This research involved fifty-eight students including thirty-three bachelor and twenty-five masters' students. Data was evaluated from the results of the (1) pre and post session quizzes in the cranial nerve interactive session; (2) from the responses of the closed structured questionnaire after a case study session on neurological disorder in the second part of the active learning process. Students are fully engaged and motivated as reflected from (1) the good result of post session quiz after an active learning interactive session compared to pre session quiz. (2) the positive answers to the closed structured questionnaires after an active and engaging case study session. The collaborative and inclusive nature of case discussion was really appreciated by the learners which are extremely active, engaging, amazing lively, interesting, and welcoming. Active learning facilitates knowledge sharing between students and their instructors, as well as relationships between peers as they help one another overcome challenges. The learners can fully express their own imaginations, intellectual curiosity, and abilities. This study has considerable inference towards medical science education. The different active and learning pedagogical approach allows students to develop their critical thinking, ability to notice, and clinical abilities. These methods help the students to gain a thorough understanding of the subject with anticipated instructor input within a useful time limit. Additionally, when educators encourage an environment that prioritises evaluation through active learning techniques, students receive greater benefits.
Keywords: *active learning, anatomy, interactive lecture, case study, medical science*

Introduction

Anatomists are under pressure to teach an incredibly broad collection of students with a variety of prior scientific literary levels, cultural backgrounds, and experiences because to the recent changes in medical education and evaluation, which have resulted in fewer contact hours and restricted resources (Bergman, 2015; Tworek et al., 2013). To raise the standard of instruction and education in facilitating student learning, creative methods must be adopted (Stansfield et al., 2016). Anything that involves students in doing and reflecting on what they are doing is considered active learning (Bonwell and Eison, 1991) or something that all students in a classroom discussion are required to do that isn't only observing, hearing, and annotating regarding the course (Felder and Brent, 2009). The students prefer to have the opportunity to be competent enough to be indulging in their subject which can be achieved through innovation in learning approaches making them intellectually curious, developing new ideas adding to their experience (Marton and Saljo, 1997; Tait and Entwistle, 1996). Learning outcomes

containing events of thought of knowledge and deeper learning techniques produce positive outcomes whereas superficial methods produce undesirable results (Al-Weher, 2004; Haggis, 2003). The knowledge of anatomy is crucial to develop concept for clinical expertise which can be adopted through projects, interactive lectures, and innovative tasks transferring instruction from information to information production (Singh et al., 2019).

Several studies showed that the lecturers portray a vital role for the students to choose the correct learning approach motivating them to have a deeper learning of the subject through student centred teaching (Johnson et al., 2013; O'Neill and McMahon, 2005; Entwistle et al., 2000; Trigwell et al., 1999; Wilson et al., 1997). A vital step is necessary for the instructor's perception how they can change the teaching learning process where they can incorporate the elements of application of knowledge and skills together by extended learning outcomes for students comprehension (Matthews and Zeidner, 2004; Barr and Tagg, 1995, Kember and Gow, 1994; Bonwell and Eison, 1991; Ruhl et al., 1987). There is different approach for engaging the students through active learning. This approach can be applied to big group of students and small group discussions. Some of the techniques are Collaborative teaching, case base studies, problem base learning and team base learning (Al-Neklawy and Ismail, 2022; Burgess et al., 2014; Parmelee et al., 2012; Gleason et al., 2011; Johnson et al., 2007). An active and engaging learning approach execution is tough and might require conquering several obstacles (Bonwell and Eison, 1991). Similar to teaching any subject, teaching human anatomy requires ongoing review and analysis to identify the methods and instruments that will best facilitate student learning (Moxham and Plaisant, 2007). We frame research questions to investigate challenges in acquiring core anatomical concept in medical science teaching, to find out ways to make teaching innovative, stimulating, engaging and memorable for future interventions and to observe the student's performance after an effective and engaging teaching session. Our study focuses on students benefit when the learning is appealing and powerful which bring changes in their academic performances.

Materials and Methods

Participants of the study

There are 58 students selected from fourth year bachelor anatomical sciences and Master of anatomical science in neuroanatomy module in semester 2. They have a prior gross anatomical knowledge but are new to neuroanatomy teaching.

Study design

It is a prospective cross-sectional study. For this study, we conducted two separate sessions each two hours on neuroanatomy topics, first one was the interactive lecture on cranial nerves and second was case study on neurological disorders. Before both the session, a small briefing was given to the whole class. The goal is to greet every student, create a secure learning atmosphere, introduce each important topic, and guide students through self-directed instructional activities by outlining their objectives and placing them in perspective of lesson plans. In the interactive lecture of cranial nerve anatomy on week 4 of neuroanatomy module, Students were tested initially with a pre session unplanned quiz of five single best answer questions on cranial nerve anatomy. To make

the class more interactive and engaging, the students then are divided into small groups of six to seven with an assigned group topic on cranial nerve for collaborative learning. They were given 10 minutes to prepare a presentation using their own choice of learning tool. To comprehend the clinical aspect of the neuroanatomy topics covered in previous weeks, further, we introduced two case studies on week 11 of Neuroanatomy module. The first case study was on "Injury to the vertebral column at the cervical region causing neurological deficits due to involvement of the spinal cord". The prime objective of this case base learning is to elucidate the basic understanding of spinal cord anatomy triggering students to explore and conceptualize its importance clinically. The second case was on "development of weakness of the body and tongue due to interruption of blood supply to the brain". This case was discussed with an aim to visualize the neurological deficits that arise due to occlusion of the blood vessels supplying the brain. To have fruitful and active discussion on the cases, the students were separated into two major groups (bachelors fourth year anatomy, N=33); master students of anatomical sciences, N=25).

Further, the bachelors and master students are separated into small subgroups of six to seven students to explore about problem areas in pursuit of answers. The students were given specific instructions to deliver a brief presentation to the whole class group in which they needed to first convey the issue that they were trying to work through before outlining their answers. Further they were asked to engage in an argument about the viability of the answers as put forward by the different subgroups over their last presentations. After the case study session an evaluation on the experience of the class was carried out. A closed structured questionnaire with five-point Likert scale was used to get feedback from the students. The following elements were covered in a questionnaire that was presented to students. First, how much more effective are case studies than pedagogical lectures? Additionally, subgroups of ten particular questions investigated how the students felt about each unique learning experience. The neuroanatomy course was organised and structured in large part because to the feedback. Towards the end of the neuroanatomy course, we evaluate the relevant surveys and their outcomes. Through this process, it was possible for us to explore, how the student felt about the lesson plans and of the course. After the semester had ended, we further evaluated the students' final test outcomes to complete our analysis by focusing on objectives. The data collected was analysed by Statistical Package for Social Sciences (SPSS) version 24. An independent t test is performed to analyse the feedback response from the participants and $P<0.05$ is considered significant. The Skills Hub Research Ethics Committee (SHREC) of our University with the reference UOD-[SHREC]-[ASC]-[TPG]-[AY22-23]-[006] granted authorization for the research's ethical conduct.

Results and Discussion

First session: Interactive lecture

There are differences in the outcome of the pre and post session quiz. An active and engaging interactive lecture boosts their potential in responding to questions in post session quiz. In this class five single based answer MCQ questions on cranial nerves anatomy were used to measure their understanding on the lesson plan. The first question was on "VII pair of cranial nerve". The question is quite basic to begin with, and 50 students (86.25%) successfully answered it in the presession quiz, while 100% of the

students correctly responded in the post session evaluation. The purpose of the question was to determine whether the students had a solid grasp of the cranial nerves and their capacity for learning their fundamental anatomy. The study of cranial nerve anatomy is one that many medical science students find to be demanding and difficult to comprehend. The second query focused on the "General Somatic Efferent Functional Component Nucleus". The students' replies (presession: 12 (21.60%); post session: 48 (83.30%) to the quizzes show that they understand the complexity of the efferent functional component after an engaging and active learning session. This is crucial since students need to comprehend that a number of these nuclei supply nerve fibres for numerous cranial nerves.

A test on the "General Visceral Efferent Functional Component Nucleus" was given in the third question. In the presession quiz, only 33 students (57.1%) properly answered the question; however, 43 students (75%) did so in the post session evaluation. This gives the notion that students were inclined to pay attention to presentations during interactive classes, which enhanced understanding and memory. Simultaneously learning about neuroanatomy requires cognitive abilities in Bloom's taxonomy, such as remembering and comprehending. The topic of the fourth question was "functional component containing the nucleus ambiguus". This quiz question was designed to make students aware of the fact that a certain functional component is expressed by one or more unique nuclei. Before the session, only 24 (41.7%) students had correctly answered this question; towards the end of the interactive lecture, 34 (58.3%) students had done so (*Figure 1*). We can infer from the response that cranial nerve anatomy's complex structure explains why cranial nerve anatomy might give the student a great deal of worry and potentially sheds light on why head and neck anatomy are tough. The topic of "functional component containing the superior salivatory nucleus" was the subject of the fifth and final question. After the lively and interesting interactive lecture session, there was a rise in the percentage of students who answered the question correctly [presession: 20 (35.1%); post session: 54.2%] (*Figure 2*). The aim of this question is to aid students in comprehending the clinical conditions in which this nucleus is suitable. Anatomists generally agree that anatomy is important for medical practise. There are many uncertainties regarding how changing anatomy instruction would affect medical science.

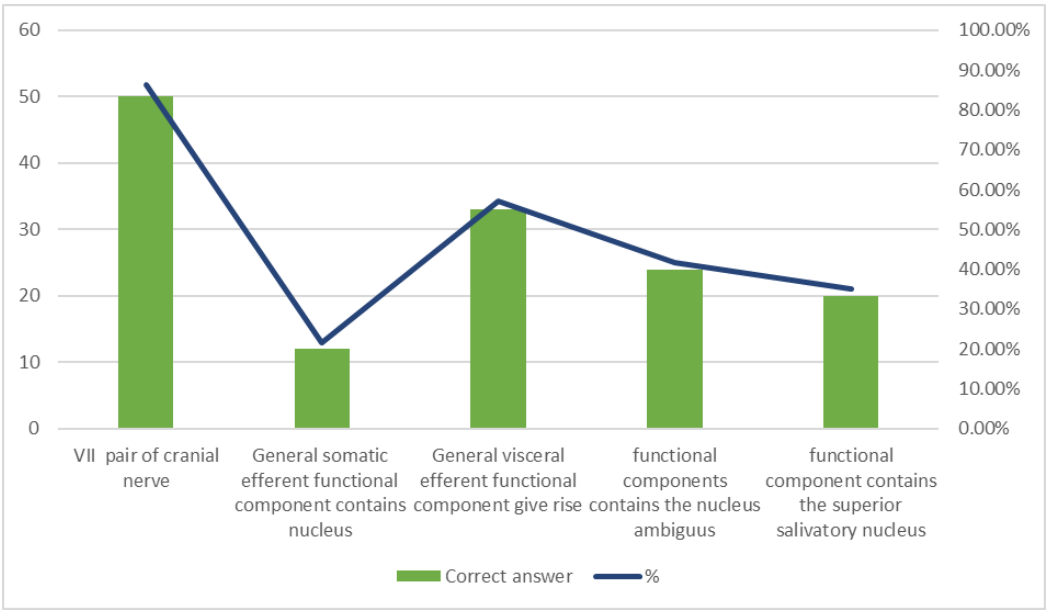

Figure 1. *Bar graph showing number and percentage of respondents with correct answer of the questions before the session.*

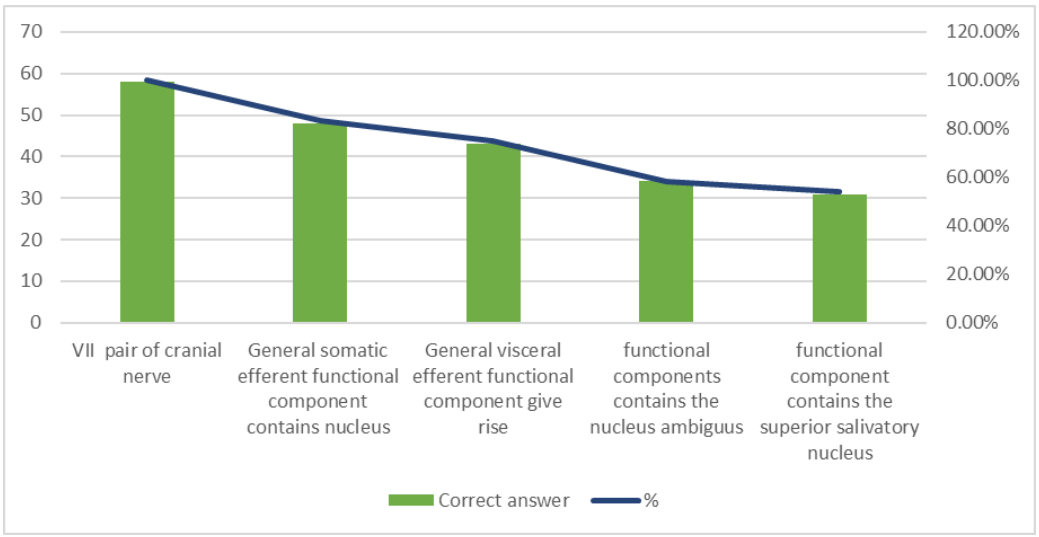

Figure 2. *Bar graph showing number and percentage of respondents with correct answer to the questions after an active session.*

Second session: Case study

The way we approached the case study session inspired the students to fully comprehend the anatomical aspects of the scenarios. This was discovered by a questionnaire that includes closed-ended questions to gauge the experience of the students. Their insight was measured in eleven distinct elements. To further determine the effects of the adaptation on various features of the session, the students were asked to visualise the section of the session that investigated elements including its collaborative nature and differences from the didactic lectures. The content addressed in the sections that follow is summarised in *Tables 1* and *Table 2*. At the end of the case study session, it is clear from the student's perspective in section 1 that they liked the larger range of resources and teaching techniques. Most students at both the

undergraduate (61%) and graduate (76%) levels felt that the case study session was more beneficial than didactic lectures. Our analysis of the responses to this question suggests that during the case study session, students were driven and gained confidence in their ability to handle more difficult problem-solving. A lot of focus was placed on how the students applied what they learned about the professional elements of the pathway flow that had previously been taught in the course.

Table 1. *Response of undergraduate students after the case study session.*

Section	Question	Percentage (%)				
		SD	D	N	A	SA
1	More productive than didactic lectures	-	-	-	39	61
2	Beneficial structure	-	-	-	55	45
3	A variety of instructional resources	-	-	-	27	73
4	More active and engaging	-	-	15	28	67
5	Gives excellent motivation	-	-	6	39	55
6	There are benefits of having an inclusive discussion	-	-	15	30	55
7	Help in providing room for improving individual creation	-	-	6	42	52
8	The amount of the information provided accelerate deep learning	-	-	-	45	55
9	Good structing and coordination	-	-	-	55	45
10	The value of the course's content	-	-	-	58	42
11	Benefit to every student participated	-	-	-	24	76

Notes: SD=Strongly Disagree; D=Disagree; N=Neutral; A=Agree; SA=Strongly Agree.

Table 2. *Response of postgraduate students after the case study session.*

Section	Question	Percentage (%)				
		SD	D	N	A	SA
1	More productive than didactic lectures	-	-	-	24	76
2	Beneficial structure	-	-	-	56	44
3	A variety of instructional resources	-	-	-	52	48
4	More active and engaging	-	-	-	16	84
5	Gives excellent motivation	-	-	-	28	72
6	There are benefits of having an inclusive discussion	-	-	-	48	52
7	Help in providing room for improving individual creation	-	-	-	60	40
8	The amount of the information provided accelerate deep learning	-	-	-	56	44
9	Good structing and coordination	-	-	8	48	44
10	The value of the course's content	-	-	4	56	40
11	Benefit to every student participated	-	-	-	36	64

Notes: SD=Strongly Disagree; D=Disagree; N=Neutral; A=Agree; SA=Strongly Agree.

According to the student perceptions for Section 2, both bachelor's (45% strongly agree; 56% agree) and master's (44% strongly agree; 56% agree) students particularly loved the case study format. Case studies are highly helpful for studying clinical anatomy in context. They are extremely beneficial for teaching challenging ideas and actively engage students in the information transmission process so that they will better understand the material to be delivered. Despite this, case studies have the undeniable advantage of being student focused. Based on section 3's observation, the variety of teaching materials was clearly valued by students pursuing bachelor's degrees (73% strongly agree; 27% agree) and master's degrees (48% strongly agree; 52% agree). The case studies were presented throughout the discussion using both power point slides and the university's online platform. The open-ended questions in each case study piqued the students' curiosity. Although correctly answering the questions was something that interested them greatly, the students enthusiastically participated in the discussion about the topics mentioned. This assessment strengthened the bond between the instructor and student. The reflections from section 4 of the students' work (bachelors: 67% strongly

agree, 18% agree; masters: 84% strongly agree, 16% agree) revealed that the case study session was incredibly active, engaging, very lively, intriguing, and welcomed. Throughout the whole session, the students were eager and engage in the discussions. Such an enjoyable learning moment gave us the motivation to make the interactive portion of the case study more comprehensive. Furthermore, the university's interactive online platform was designed to raise students' expectations for participating actively in the dissemination of knowledge during the allocated time.

According to what they think about section 5, the students in the bachelor's (55 percent strongly agree, 13 percent agree), and master's (72 percent strongly agree, 28 percent agree) programme are ecstatic about how inspiring the case studies are. However, 6% of bachelor's degree candidates support Section 5 in a neutral manner. During the session, we encourage questions from the students and are prepared to react to them. This assists the students get over their apprehension about answering questions in front of the class. Throughout the session, a flexible environment was maintained in terms of the degree and type of help that would be needed for each unique group of students. The perception on section 6 shows that the students highly valued the collaborative and inclusive style of case discussion (bachelors: 55% strongly agree, 30% agree; masters: 52% strongly agree, 48% agree). However, 15% of bachelor's degree candidates are ambivalent about working together on case studies. A classroom contains a diverse population of students. During an active and engaging session usually, weaker students feel excluded from a group or even clubbed together, which would undermine their efforts to participate in problem solving and assimilate new information. We track the momentum of the student groups' discussions and assist them as they navigate the questions. The challenged students frequently struggle to contribute to group conversations and overcome their fear in interacting in front of their peers. We thoroughly wrap up the lesson and communicate the main learning goals to everybody in the classroom to make sure those who are struggling have an opportunity to follow up with the information discussed throughout the interactive discussion. This helps the students from the start to play an active role in problem solving collaboratively prevailing them to remove the barrier among themselves in the lecture hall and with their instructor.

Regarding to the comments in section 7, the students (bachelors: 52% strongly agree, 42% agree; masters: 40% strongly agree, 60% agree) thought that these interactive and engaging classes would provide them more room to develop their own originality. The students appeared more comfortable after the advantages of this type of method were made evident and casualness of the small learning group was emphasised. The truth is that several groups used a whiteboard to draw attention to the key points of their brief presentation. Students developed the ability to process information concerning anatomy, and eventually, employ the information they have acquired in useful ways. Owing to the perceptions on section 8, students (bachelors: 55% strongly agree, 54% agree; masters: 44% strongly agree, 56% agree) support effective strategies and believe that having access to a wealth of knowledge helped them foster deep learning. The open-ended questions in the case studies encourage students to use higher order thinking capabilities to solve the problems which need a deep learning strategy. The case studies suggested a better understanding of the anatomy knowledge. Further makes it possible to allocate instructional time more effectively and provides a framework for assessing the effectiveness of activities. The responses from section 9 confirmed that learners (bachelors: 45% strongly agree, 55% agree: masters: 44% strongly agree, 48% agree)

love the good structuring and coordination of the study materials for the case studies. The case study materials are structured with the perception that the students can follow the information in effective way. This starts with a clinical scenario followed by open ended question which fosters decision-making rather than just mere factual memory. Basically, it is difficult to involve everyone while engaging them at their own levels. We initiate by an established fundamental guideline so that everyone is aware of exactly what they can anticipate of them.

Most students (bachelors: 42% strongly agree, 58% agree; masters: 40% strongly agree, 56% agree) valued the course content of the case studies as evidenced from perception of students on section 10. The anatomy course acts as a link across fundamental anatomy and the field of healthcare activity. Using a problem-solving learning strategy, our clinically focused case study and questions help students to become more comfortable conceptualizing anatomy. Eventually, from section 11 perception, majority of students (bachelors: 76% strongly agree, 24% agree; masters: 64% strongly agree, 36% agree) verified these interactive and collaborative lessons benefited them a lot. We remained focused from the outmost that towards the end of this active and engaging case study session, students will develop fundamental social instincts and important general competencies, such as skills in presenting, interpersonal abilities, managing time and innovation which will facilitate them in continuous learning process. The students realizes that this engaging class has foster ingenuity, soft skills, and exploration. They have believed this to be an interacting and appealing method to obtain knowledge which will help them in sustaining a long-term memory conceptualizing anatomy. *Table 3* shows how the participants evaluated the case study session. The ratings for the section 1 (bachelors: 4.6±0.49 points, masters: 4.8±0.43 points), section 2 (bachelors: 4.4±0.50 points, masters: 4.5±0.50 points), section 3 (bachelors: 4.5±0.45 points masters:4.4±0.50 points), section 4 (bachelors: 4.5±0.75, masters: 4.8±0.7), section 5 (bachelors: 4.4±0.6, masters: 4.7±0.45), section 6 (bachelors: 4.3±0.74, masters: 4.5±0.50) are analogous to for both group of students. However, significance difference is seen in section 1, section 3, section 4 section 5 and section 6 categories. This shows engaging components encourage students to actively participate in information transmission, which increases focus and motivation and ultimately fosters learning. Furthermore, the ratings for section 7 to section 11 are almost similar. No significant difference is recorded as $P>0.05$. The sections rating verified that case study session collaborative, extremely engaging, and inclusive.

Table 3. *Evaluation of case studies feedback response from participants of the study*.

Section	Questions	Undergraduate student (N=33)	Postgraduate students (N=25)	p-value
1	More productive than didactic lectures	4.6±0.49	4.8±0.43	0.02
2	Beneficial structure	4.4±0.50	4.5±0.50	0.62
3	A variety of instructional resources	4.5±0.45	4.4±0.50	0.04
4	More active and engaging	4.5±0.75	4.8±0.7	0.03
5	Gives excellent motivation	4.4±0.61	4.7±0.45	0.01
6	There are benefits of having an inclusive discussion	4.3±0.74	4.5±0.50	0.04
7	Help in providing room for improving individual creation	4.5±0.56	4.6±0.50	0.61
8	The amount of the information provided accelerate deep learning	4.5±0.50	4.4±0.50	0.57
9	Good structing and coordination	4.4±0.50	4.3±0.63	0.52
10	The value of the course's content	4.4±0.50	4.4±0.56	0.72
11	Benefit to every student participated	4.7±0.53	4.6±0.49	0.33

Acquiring core anatomical concept

Learning anatomy through active engagement represents a strategy with a variety of techniques for instruction that may be used. This technique support connections among peers as learners assist one another in solving difficulties, in addition to facilitating exchanges of information from instructors and learners (McKeachie, 2007). However, integrating information and abilities across a specific setting to another can be challenging for learners. This can be overcome by intricate nature of competence which make changes in students in accordance with the learning environment (Eva et al., 1998). The current investigation illustrated that the learners gained anatomical knowledge on cranial nerves anatomy from the lively and captivating classroom approach. The students get a chance to take full advantage of their unique imagination, inquisitive and intellectuality. Additionally motivating them to incorporate and utilise information positively and engaging way. In this study, it was observed that participants considerably did excellent in post-session interactive lecture quiz on anatomy (*Figure 2*). This is perhaps due to the active and engaging session implemented during the class. Several current investigations on active learning have combined diverse educational techniques with new technologically driven creative instructional methodologies to enhance learner's experience (Guimarães et al., 2017; Singh and Kharb, 2013). The participants in this research opted to convey their ideas on various neuroanatomy topics using variety of apparent artistic, and performing arts-related techniques, mostly PowerPoint presentations, games, and posters. According to reports, these methods might assist the neuroanatomy students develop their critical thinking, ability to notice, and clinical abilities (Edmonds and Hammond, 2012; Shapiro et al., 2006).

To mutate the normal anatomy teaching of the cranial nerves, case study session on neurological disorders is introduced to a more interactive session. The students were categorized as bachelors and master's student. The learners were surveyed with close ended questionnaire in order collect their views on the strategies with the aim to determine the impact of implementing this session. The first and foremost, the participants found the session active and participating. Next, creating an interactive case study allowed the students to have a deep learning of the topic and the subject. Then, interaction with the lecturer motivated them to improve the way they instruct which boost the learner's perception and assessment of the curriculum. Conclusively, helps the students to comprehend fundamentals of the neuroanatomy topic (Zimmermann and Eckert, 2010). In this study Majority of the bachelor and master students discovered that case studies were more beneficial than didactic lectures. The retention of knowledge of anatomy is high among students by perception of the clinical anatomy significance through case studies (Malau-Aduli et al., 2013). On the other hand, a previous study showed no significant distinction between a case study session and other methods of teaching among learners. Another research confirms, 80% to 70% students prefer case studies over didactic lectures. The students are extremely persuaded by case study session which is observed in this study (Khoshnevisasl et al., 2014). Similarly, one more study evidenced indistinguishable results towards case studies of anatomy over other modes of learning (Hansen and Krackov, 1994). An active and engaging learning session encourage the students to comprehend a deep learning of the topic with anticipated faculty contribution within a valuable time frame (Barnwell et al., 2016).

Stimulating, engaging and memorable teaching for future intervention

In this study the grouping of students with interaction between peers makes the session more interactive and engaging sharing their views and ideas in the group and among the peers. A learner could apprehend the subject matter effectively only if they accomplished to analogize and construct the knowledge cooperatively with their peers (Ozgonul and Alimoglu, 2019; Burgess and McGregor, 2018; Burgess et al., 2014; Topping, 1996). Instruction in small groups gives students the chance to work closely with their peers and fosters team-building abilities, which are crucial for certain working environments (Englander et al., 2013; Meo, 2013). Consequently, small group discussion situations with peers are warm and encouraging (Kitchen, 2012). Another way to keep the learners engage and active is to put a question during the discussion, it encourages higher order thinking capacity among the students and peers (Lake and Ryan, 2004). In the current study, open ended questions follow each of the case studies. One of the benefit of asking frequent questions in group discussion establishes a student centred perspective which enable the facilitator to recognise the educational demand for a particular students to facilitate their knowledge construction (Watts and Pedrosa, 2006). The application of probing questions develops reflective thinking, advances scientific reasoning, and allows the instructor to keep track of the students development (Spencer, 2003; Dake and Taylor, 1994). This encourage the students to be analytical and inspire them to do reflection and exchange views between them. Moreover, in this study both in the first session on cranial nerve and second session of case studies on neurological disorders, the small group discussion allows the students to conceptualize the anatomy of cranial nerves and anatomical changes in neurological disorders promoting critical thinking and making it innovative for future intervention (Lake et al., 2005). Overall, the instructor plays a vital role model as they are the one who construct the lesson plans and develop the learning objective for a learning session. Moreover, they figure out the anticipation from the students, create a positive teaching atmosphere, encouraging engagement and arguments, and establishing fundamental guidelines (Curzan and Damour, 2011).

Student performance and assessment modalities

The grouping of the students during the interactive lecture session and in case study period to solve a problem organizes a range of actions and the culmination of these actions produces the result that responds to the guiding subject matter (Hmelo-Silver, 2004). Investigators are particularly intrigued about the way learners' study as instructional processes are impacted by assessment (Gijbels et al., 2008). Educators may successfully assist learners enhance their academic performance by coordinating assessment with classroom activities and anticipated learning objectives (Tang and Biggs, 2007; Boud and Falchikov, 2006). Students will see larger advantages from their experience at universities wherein instructors foster an atmosphere that emphasises evaluation through active learning practices (Umbach and Wawrzynski, 2005). In an active learning strategy, students do outstanding performance (Méndez, 2009). This is supported by our study's results, which show that students performed far better on the quiz at the end of the session than they did at the start. The research is single-centred and has a short time span as a limitation. Limited study participants as well. It is advised to use a multi-centred approach and a large sample size to improve results.

Conclusion

The ideal strategy for imparting anatomy knowledge is to use a variety of educational materials that support one another; students seem to gain maximally from the integration of these resources. Students like participating actively in interactive lectures and interaction amongst them during session keeps them engaged. This improves students' comprehension as well as their capacity to analyse and consolidate information. If the interactive lectures are followed by case studies students develop their authority by investigating through interesting patient scenarios that cover the medical history, symptoms, diagnosing, and recommended management. It reinforces basic anatomical knowledge while also enhancing critical thinking abilities. The results of the current study demonstrated how effective an instructional strategy the active and interactive learning approach is in forcing students to use their imagination, intrusiveness, and decision-making. There must be more study on interesting and dynamic sessions in anatomy, though, as there isn't much of it.

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Conflict of interest

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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