Innovation in clinical teaching: diabetic foot care management using jigsaw teaching strategy in family medicine

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ABSTRACT

Objective: To assess peer interaction and students' perception using Jigsaw learning activity.
Study Design: A cross-sectional observational study
Place and Duration: At College of Medicine and Health Sciences, National University Oman on 26th February 2019.
Methodology: A total of 38 final year medical students participated in the study using jigsaw activity in diabetic foot workshop; the diabetic foot examination, management of diabetic foot, factors predisposing foot ulcer and counseling foot care in diabetic population.
Results: Out of 38 participants (18.4%) were male and (81.6%) were female, 89.1% agreed that jigsaw activity develop a critical attitude, interpersonal skills and (91.8%) work in an interdisciplinary team skills. Similarly, most of the participants believed that after activity students have been found jigsaw technique helpful (86.4%) and think that topic and think that it should be kept in this course in future (86.4%).
Conclusion: The Jigsaw approach focuses on learning in groups with fellow learner co-operation and all participants involve actively adding on to the group dynamics.
Keywords: Primary health care, Diabetic foot, Learning, Medical Students, Education, Jigsaw Technique, Family medicine, Clinical teaching

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INTRODUCTION

The "Jigsaw Technique" (JT) is a modern teaching strategy that helps students to contribute and depend on one another for problem solving[1]. The jigsaw method has shown appropriate comprehension/ communication skills in students with peer learning and team work among students. This technique also improves listening and communication skills. This teaching strategy is helpful to complete multiple tasks and giving students a sense of responsibility to work in a team[2,3].

The Jigsaw approach is a co-operative learning, focuses on learning in groups with peer and all participants involve actively adding on to the group dynamics[4,5]. Students learn to respect other group members with helping each other to solve the problem. This learning technique has advantage to reduce competitive attitudes rather build helping attitude amongst students to resolve complex objectives[6,7].

In Jigsaw strategy, students are engaged and accountable for their own learning. This also increases the interaction and establishes an atmosphere of cooperation and promotes interpersonal, accountability and leadership skills. Literature reports that jigsaw teaching method promotes students' motivation for teamwork, enjoyable learning, learning achievement, success in learning related to raises in self-confidence and refreshment of information, self- confidence, and self-esteem among students[8,9].

This strategy motivates learners` as they engage in tasks in their expert groups with full involvement because they are aware that they have to teach the content when they move back to their corresponding home groups. Students helped each other in the learning process and it was the responsibility of each member in a group to make sure that other group members had learnt the

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concepts in expert groups. All students thus come at one level of learning because of teamwork[10,11].

Student-centered learning best worked if the learner has autonomy and independence. Jigsaw is a cooperative learning technique, which not only promotes learning but make it more interesting when the students become teachers. Jigsaw learning activity was implemented in family medicine curriculum as a pilot study with the aim of promoting peer interaction and cooperation and students' perception were measured using a validated feedback questionnaire. We have conducted this study to assess peer interaction and students' perception using Jigsaw learning activity. The objective of our study was to assess peer interaction and students' perception using Jigsaw learning activity.

METHODOLOGY

This cross-sectional observational study was conducted on final year medical students at College of Medicine and Health Sciences, National University Oman in family medicine rotation. Final year medical students rotating in Family Medicine Department were included in this study after taking consent. Data was collected on self-administered survey questionnaire. The questionnaire was developed taking into account the learning objectives, competencies and skills that should be acquired by students, as described in the course syllabus of family medicine**.**

After several brain storming sessions within faculty of family medicine a detailed teaching plan in small group was planned. Around seven topics in family medicine rotation of core competency knowledge topic were identified which can be done in Jigsaw technique including diabetes management, diabetic foot care, hypertension, evaluation of acute coronary syndrome, assessment and management of anemia, obesity and assessment/management of depression in primary care. After further discussion the teaching faculty selected diabetic foot care for this activity.

Teaching materials were identified in the discussion and communicated to the students 2 weeks before the activity date. References books and material given to the students, American diabetic association guide line, Ministry of Health Oman guide line www.moh.gov.om). Faculty in charge made a random selection of 4 groups with 4-5 students in each and distributed the 4 objectives to 4 groups.At the end of the activity students were given MCQ and short answer questions related to the diabetic foot.

Data was collected using a purposive sample technique of undergraduate final year medical students utilizing a self-filled study questionnaire as a pilot study. A favorable ethical opinion was obtained from institutional ethics board and an informed consent was obtained from study participants. Survey instrument made after literature search and reviewed and agreed after several brain storming sessions with family medicine faculty facilitator and experts. Validity of the questionnaire was done in different dimension including apparent, face, content and construct which reflects the concepts to be measured. Content validity was done by two experts in medical education in the college. All participants after explaining the importance and objective of the study and taking informed consent, participants were requested to respond anonymously to written questions.

The questionnaire had Students' perception, knowledge and attitude regarding Jigsaw activity in Diabetic Foot teaching session. The response on overall satisfaction and post teaching feedback with suggestions were also asked.

Data Analysis: Data was analyzed using Statistical Package for Social Sciences (SPSS) version 20 for percentage, frequency and mean. Cronbach's alpha was used to evaluate the internal consistency reliability associated with scores derived from a scale. For the overall reliability, the Cronbach's alpha value was 0.945.

RESULTS

A total of 38 final year medical students participated in the study of which 7 (18.4%) were male and 31 (81.6%) female students. Participants were asked multiple questions about their attitude regarding Jigsaw activity in Diabetic Foot Workshop. Their answers were coded from 1 to 5 where 1 is strongly agree and 5 is the strongly disagree. Agreement was highest for the statements suggesting that jigsaw activity develop a critical attitude (89.1%), interpersonal skills (89.1) and work in an interdisciplinary team (91.8%).

In the questionnaire, students were asked about their knowledge and skill regarding Jigsaw activity in diabetic foot workshop. Majority of the participants believed that after jigsaw activity in diabetic foot workshop they well understood the diabetic foot examination (89.1%), management of diabetic foot (91.9%), factors predisposing foot ulcer (97.3%) and counseling foot care in diabetic population (94.6%).

Students (86.4%) have been found jigsaw technique helpful and think that it should be kept in this course in future (Figure-1).

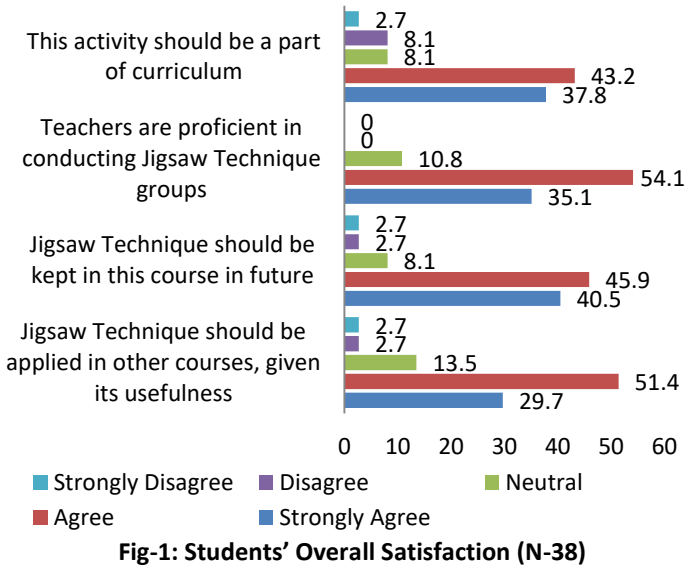

Fig-1: Students' Overall Satisfaction (N-38)

Table-I: Students' Post-workshop Feedback (N-38)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Objectives of this workshop was clear and achieved	16 (43.2)	17 (45.9)	3 (8.1)	0	1 (2.7)
Topic and content was intellectual and motivating	14 (37.8)	18 (48.6)	5 (13.5)	0	0
This workshop has increased the level of confidence/ competence	18 (48.6)	16 (43.2)	3 (8.1)	0	0
Facilitation of work shop was appropriately done	14 (37.8)	20 (54.1)	3 (8.1)	0	0
Preparing before JT stimulated interest with clear understanding	16 (43.2)	19 (51.4)	2 (5.4)	0	0
Guided me to take responsibility of my learning	16 (43.2)	18 (48.6)	2 (5.4)	1 (2.7)	0
Preparing for the JT was time consuming	10 (27)	7 (18.9)	14 (37.8)	5 (13.5)	1(2.7)
Enjoyed the team work	17 (45.9)	18 (48.6)	0	1(2.7)	1(2.7)
Promoted critical thinking and in-depth knowledge	15 (40.5)	16 (43.2)	4 (10.8)	1(2.7)	1(2.7)
Helpful in developing better understanding of topic and my information synthesizing skills	12 (32.4)	19 (51.4)	4 (10.8)	1 (2.7)	1 (2.7)
Helped in understanding the topic in a sequential orderly organized manner	12 (32.4)	19 (51.4)	5 (13.5)	1 (2.7)	0
Opportunity to observe peer and practice skills	15 (40.5)	18 (48.6)	4 (10.8)	0	0
Self-Assessment identifies the weakness and strength	12 (32.4)	22 (59.6)	1 (2.7)	1 (2.7)	1 (2.7)
Feedback was constructive, well-structured and organized	11 (29.7)	21 (56.8)	4 (10.8)	0	1 (2.7)
Would like to recommend this activity to others	13 (35.1)	18 (48.6)	4 (10.8)	0	2 (5.4)
Overall quality of the activity met my expectation	12 (32.4)	21 (56.8)	3 (8.1)	1 (2.7)	0

Furthermore, students believe that activity should be a part of curriculum (81%).

At the end of workshop student were asked multiple questions about their feedback regarding workshop (Table-I).

Majority of the students (89.1%) agreed that objectives of workshop was clear and achieved and workshop provide an opportunity to observe peer and practice skills. Similarly, 83.8% students agreed that workshop had helped them in understanding the topic in a sequential orderly organized manner.

DISCUSSION

Jigsaw technique is new modality in medical education however, there are few articles published regarding its use in clinical teaching. Most of the time clinical teaching is opportunistic with some standardization. There are some core knowledge topics in clinical teaching which can be selected for jigsaw team based learning[12].

In this study students have agreement for the statements suggesting that jigsaw activity develop a critical attitude, interpersonal skills and work in an interdisciplinary team. They feel that this kind of learning improved their problem solving and decision making skills. Same findings are discussed by Vinod that the students preferred jigsaw over the tutorial. Jigsaw strategy is an appropriate tool to increase the cognitive skills and can be modified according to the needs of various topics across different disciplines[13,14].

This study also highlights the importance of ability to put knowledge in to practice. Majority of the students believed that after jigsaw activity in diabetic foot workshop they well understood the diabetic foot examination, management of diabetic foot, factors predisposing foot ulcer and counseling foot care in diabetic population . Hossein et al reported team based learning approach to teaching has been increasingly employed in undergraduate medical education in medical students have generally expressed strong satisfaction with early applications to undergraduate medical education. JT in various fields has shown significant positive results in learning[15,16].

Literature has also reported that JT develops self-confidence, communication among students, student support, logical thinking, ability in problem solving, motivation, and critical thinking. The findings are same as our study. Clinical teaching needs to focus on application of knowledge and critical thinking to improve patient care[17,18].

In our observation the students (86.4%) have been found jigsaw technique helpful and it should be kept in this course in future (Figure-1). Furthermore, students believe that activity should be a part of curriculum. Based on the present findings and the results of similar studies published, this learning technique is recommended for teaching core knowledge to the medical students. At the end of workshop student were asked about their feedback regarding workshop (Table-I). Majority of the students (89.1%) agreed that objectives of workshop was clear and achieved and workshop provide an opportunity to observe peer and practice skills. Similarly, 83.8% students agreed that workshop had helped them in understanding the topic in an organized manner.

There are various team based learning practiced in different medical schools however, JT is not a regular strategy in clinical teaching[19,20]. This is a popular in pre-clinical and basic science studies where lectures are replaced by JT effectively. In clinical teaching may be this is time consuming but if planned

appropriately it can be use full for some core key skills like communication, team work, collaboration and core knowledge topic[21]. Medical students are autonomous, independent and self-directed learner and future educator can gain confidence and effective leadership quality for patient care using team based learning[22].

This study is limited by the small convenience sample drawn from final year students list rotating in Family Medicine Department. This study should serve a call to action to educational researchers to investigate the effectiveness of JT in clinical teaching with larger sample size.

CONCLUSION

The Jigsaw approach focuses on learning in groups with fellow learner co-operation and all participants involve actively adding on to the group dynamics.

CONTRIBUTION OF AUTHORS

Jahan F: Conceived idea, Literature search, Manuscript writing
Siddiqui MA: Data analysis, Manuscript writing
Aguiar MR: Data collection, Literature review

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