ORIGINAL ARTICLE

An Innovative Way to Teach Anatomy in Integration: Near Peer Assisted Learning

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ABSTRACT

Objective: To implement and evaluate Near peer-assisted learning (NPAL) in Small group discussions (SGD) to build correlation of anatomy and clinical sciences.

Study Design: A quantitative descriptive study.

Place and Duration of Study: Study was conducted in Anatomy department for a period of 4 months.

Materials and Methods: Entire first year MBBS class (100 students) was included as Near peer learners (NPL) and 3 students of second year MBBS session who had secured more than 60% marks throughout first year assessments and in summative exam were included as Near peer tutors (NPT).

NPAL was applied in small groups to correlate upper limb nerve injuries site of lesion with their symptoms. First year was divided into 6 batches with 12 to 15 students each. In first SGD 3, batches attended session with junior faculty while 3 with NPTs, both having same learning objectives regarding 4 upper limb nerves and their injuries. In second SGD the subgroups were flipped and exposed to same strategy where 3 new upper limb nerves and their injury sites were taught. Thus entire First year students were taught seven upper limb nerves overall, half exposed to NPAL for one set of nerves and second half of class exposed to NPAL for second set of nerves. Pre and post SGD MCQs were administered in each SGD to see the cognitive gain of learners. At the end of second SGD a 5 point Likert scale questionnaire was used to assess learners' perception regarding NPAL.

Results: Analysis of pre & post SGD MCQ tests mean score of faculty and NPT taught sessions in both SGDs was found to be higher when taught by tutor though not statistically significant. Paired *t test* and Pearson correlation applied to questionnaire on SPSS version 21 showed that concept building and comprehension was almost equivalent in both while learning environment was found to be more conducive when taught by NPTs. The learners also felt better prepared for exam when taught by NPT.

Conclusion: NPAL, when used in small groups, is found to be equivalently useful and effective learning strategy regarding concept building and comprehension of complex concepts of anatomy and its correlation with Clinical sciences. The learners have shown cognitive gain and are satisfied with near peer tutors teaching in small groups.

Key Words: *Anatomy in Integration, Near Peer Assisted Learning, Near Peer Learners, Near Peer Tutors, Small Group Discussions.*

Introduction

Medical curriculum delivery is in the phase of shifting from traditional system to integrated system in Pakistan.[1] In integration Gross Anatomy, Histology , General Anatomy and Embryology all has to be balanced with two Basic Sciences , Preventive , Legal and Clinical subjects in first two years of medical school in most of colleges.[2] Being mostly taught in modules and according to themes it becomes difficult for student to make a concept.[3] Its vertical integration with Clinical sciences, though interesting, becomes exhaustive for students. In addition lengthy reading hours from challenging text books make this subject least interesting.[4] The result is either students leave it on choice or have a higher failure rate.[5] Teaching it in an innovative way removes the fears of new comers and develops learning skills in them.[6]

In order to make the students understand the concepts and enhance their cognitive skills, the medical educationists are always in search of feasible new instructional strategies. One of them is Peer assisted learning (PAL). A working definition of PAL is " People from similar social groupings who are not

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professional teachers helping each other to learn and learning themselves by teaching."[7] The general idea behind peer tutoring is students helping students.[8] Help means providing support to others either in gaining knowledge or guiding others with new learning resources or helping in enhancing communication or competency skills. PAL programs are not meant to replace instruction, but to complement it.[9] Near-peer assisted learning (NPAL) is a type of PAL in which the Near peer tutors (NPT) are someone at least one year senior to their Near peer learners (NPL) regarding training.[10] Cognitive and social congruence, the basic idea in NPAL teaching, stands on the fact that Near peer tutors, being one year senior, are familiar with difficulties the learners will face in their studies which the faculty cannot anticipate. Student learners find it more convenient and relaxed to communicate with Near peer tutors as both have same social roles.[11] Globally NPAL has been accepted to inspire the learners to contribute to the learning activity giving learners ownership of their own learning ultimately leading to better understanding and concept building.[12]

Small group discussions is one of the teaching learning methodology for delivering integrated curriculum in which small number of learners get better chance of one is to one interaction and clarify their concepts easily.[13]

Delivery of integrated curriculum is resource intensive in terms of trained staff and logistics. There is paucity of trained junior faculty in Basic sciences which is involved in small group teachings in most of the undergraduate medical institutes. In addition most of the colleges found it difficult to involve patient committed clinicians to deliver the clinical integration in preclinical years. Anatomy, a high volume subject, becomes a formidable course when integrated with three or four subjects together. The need of hour is to apply some innovative teaching methodology capable of enhancing complex concept building in medical students and assisting the faculty in faculty compensated medical institutes.[14] Work has already been done Nationally and Internationally using new teaching and learning strategies and comparing them with lecture format but there is no study using any teaching intervention in small group discussions side by side with faculty teaching in small groups to see its efficacy in terms of learners gain especially in an integrated curriculum. This pilot study was planned with an objective to implement and evaluate Near peer-assisted learning (NPAL) in Small group discussions (SGD) to build correlation of anatomy and clinical sciences.

Materials and Methods

This descriptive quantitative pilot study was conducted in Anatomy department of a private medical college associated with Shaeed Zulfiqar Ali Bhutto University (SZABMU), Islamabad, Pakistan. The study lasted for a period of 4 months. Entire First year MBBS session comprising of 100 students was included as a convenience sample as NPLs and 3 students of Second year MBBS session who had secured more than 60% marks throughout First year assessments and in summative exam were included as NPTs. After the approval by Ethical review board of SZABMU, the Principal investigator (PI), an MPhil in Anatomy, took verbal consent from both NPLs and NPTs after explaining them the objectives and strategy.

The curriculum in 1st and 2nd year MBBS is delivered in 3 blocks comprising of two, 6 weeks long, modules in our university. The Basic sciences are horizontally integrated with each other and vertically integrated with Clinical sciences. NPAL was introduced in small groups in second module of Block 2 mainly concerned with integration of upper limb Anatomy, nerve Physiology, Biochemical and Clinical aspects. The NPTs were given a training session of 1 hour by PI on how to facilitate SGD and whom to contact in case of any problem arising during or after the session.[10]

1st year was divided into 6 batches: A, B, C, D, E and F with 12 to 15 students in each batch. In first SGD Batch A, B and C attended SGD session with junior faculty while Batch D, E and F with NPTs. The session lasted for 2 hours. Both the NPAL assisted and non-assisted groups had similar learning objectives regarding four nerves, their injuries and correlation of symptoms with the site of lesion in upper limb. Next week the batches were flipped and exposed to same strategy as above in second SGD where 3 new upper limb nerves and their injury sites were taught. Thus entire First year students were taught seven upper limb nerves overall, half exposed to NPAL for one set of nerves and second half of class exposed to NPAL for second set of nerves .

A pre and post SGD MCQ test (C2 and C3 level) was taken in each SGD, by PI, to assess the cognitive gain of NPLs.

For recording learner's perception, a 5-point Likert scale questionnaire was used which was modified by PI from a validated questionnaire, already used nationally and internationally, based on grounded theory framework of peer assisted learning.[15] It was modified from 7 to 5 points by removing the questions having duplication of responses. After modification it was validated by 2 medical educationists. At the end of second SGD the questionnaire was given to those NPLs who had attended both the sessions. It was collected on the same day. Concept building and comprehension, Learning skills development, Interactive and cooperative learning and Learning environment were four main domains of the questionnaire.

The data was analyzed on SPSS version 21.Paired *t* test and Pearson correlation was applied with p value of ≤0.05 set as cut off point for statistical significance.

Results

Out of 100, 79 (79%) students participated in both SGDs. Analyses of Pre & Post MCQ tests mean faculty taught score was 6.89 ± 1.69 while mean NPT taught score was 7.29 ± 2.38 though not statistically significant (p= 0.18)

Regarding perceptions most of the individual parameters showed fair positive correlation.

Concept building and comprehension were almost equivalent in both groups while learning environment was found to be more conducive when taught by NPTs (Table I and II). NPLs felt better prepared for solving short answer questions when taught by NPTs (Table II) 'The sessions provided opportunity to air concerns away from teaching staff and sessions provided an opportunity for learning with others' had a strong correlation when taught by NPTs (Table II). Few parameters like 'sessions were helpful in improving my communication skills and session stimulated me to take part in active discussion', had mean responses which were close to neutral response. The learners were not clear about the learning skills development (Table II)

Discussion

Peer assisted learning helps by providing additional student support in curriculum delivery, in preparation of assessments, by providing feedback,

Table I: Comparison of Correlation of Teaching by Faculty and NPTs according to Subtotal Scores of 4 Domains of Questionnaire

	Taught by faculty		Taught by NPAL	
	Correlation	p-value	Correlation	p-value
Concept building and comprehension	0.24	0.11	0.21	0.15
Learning skills development	0.17	0.26	0.09	0.52
Interactive and cooperative learning	0.25	0.10	0.08	0.60
Learning environment	0.09	0.57	0.16	0.29

NPAL: Near peer-asisted learning

Table II: Comparison of Correlation of Individual Parameters of 4 Domains Between Teaching by Faculty and NPTs

	Taught by Faculty		Taught by NPAL	
	Correlation	p-value	Correlation	p-value
Concept building and comprehension				
The sessions were helpful in understanding the subject matter of the course	0.154	0.31	0.091	0.55
The sessions provided opportunity to clarify basic concepts	0.102	0.50	0.134	0.38
The sessions provided opportunity to clarify complex concepts	0.358	0.01	0.215	0.15
The sessions motivated me to learn more about the module content	0.256	0.09	0.105	0.49
The sessions were helpful for me in better preparation of solving assignments and SEQs	0.003	0.98	0.205	0.17
Learning Skills Development				
The sessions inspired me to use multiple study resources	0.009	0.14	0.038	0.80
The sessions inspired me to develop self- study skills	0.124	0.41	0.000	0.99

The sessions inspired me to develop group-study skills	0.231	0.12	0.168	0.26
Interactive and Cooperative Learning				
The sessions were helpful in improving my communication skills	0.259	0.09	0.146	0.34
The sessions stimulated me to take active part in discussions	0.374	0.01	-.057	0.70
The sessions provided an opportunity for learning with others	-0.060	0.69	0.108	0.48
Learning Environment				
The sessions were informal	0.037	0.81	0.170	0.26
The sessions made learning enjoyable	0.281	0.06	0.217	0.15
The sessions provided reassurances about course related concerns	0.027	0.86	0.011	0.94
The atmosphere of the sessions was comfortable and relaxed	0.061	0.68	0.039	0.80
The sessions provided opportunity to air concerns away from teaching staff	-0.115	0.46	0.101	0.52
I was allowed to ask questions whenever required	0.226	0.13	0.109	0.47
The environment was conducive for me to discuss with peers the course related questions and explanations of the answers	0.044	0.77	0.109	0.47

by mentoring and by re planning the curriculum.[16] It enhances cognitive gains[17], develops generic skills, provides psychological support[18] and leads to attitude development.[19]

In our study we used near peer tutors to teach integration of Anatomy with Clinical science, in small groups, along with junior faculty. The leaners cognitive gain was found to be more with near peer teaching though not significant. The learners were satisfied with both the faculty and near peer teachers. There is not much difference in concept building of anatomy and its correlation with Clinical sciences between tutors and faculty while learning environment was fairly positive in tutor taught group.

Worldwide, students perspective of acceptance of peer assisted learning is found out to be high. A study published showed that 82% of the learners showed satisfaction with peer teaching model used in skills training while only 1% were of the opinion that skills training should be provided by faculty only. [20] This strategy helps in building up course satisfaction in learners by removing subjective stress due to the social and psychological support provided by the peer tutors.[21]In current study the learners were satisfied with the teaching and integration of complex anatomical concepts by the tutors. NPAL improves examination scores among learners.[22] The result of current study also showed cognitive gain by the learners. Learners find the learning environment conducive in peer assisted learnings[23] similar to current study.

In Pakistan, PAL has been used formally in various studies either as a pilot or as a full fledge course. Encouraging results are reported in terms of students' acceptance and learning.[15,23,25]Some studies have shown high score achievement by learners when taught by NPTs as compared to faculty [26] while some reports confirm at least same level of knowledge gain.[8]

Anatomy dissection when taught by PAL helped the learners in building concepts and motivated them for self-study.[27] Overall performance of students increased from 87 to 88% in a course of Anatomy when delivered by NPT and assessed by quizzes and question bank, over a period of four years.72% of the students responded in affirmation with enhanced understanding of Anatomy concepts when taught by NPTs.[28] Current study results also exhibited a better understanding Anatomy as is assessed by MCQs though it was not significant.

Current study is different from other work done in

Pakistan as we have used near peer tutors and faculty simultaneously, in small group discussions, to teach complex anatomical concepts in integration with clinical signs and symptoms. Our aim was not to find superiority of tutors over faculty but to see if Near peer learners can understand the complex anatomical concepts in integration with clinical sciences when taught by Near peer tutors. In the long run near peer tutors can be used to facilitate the faculty in faculty compensated medical institutes.

Limitation

Only two SGDs were used for NPAL experimentation as it was a pilot study. We found it difficult to schedule the timetables of Near peer learners and Near peer tutors. Learner's perception taken by a questionnaire could have been strengthened by arranging a focus group discussion at the end of intervention along with the questionnaire. Our time constraint didn't allow us to conduct it.

To see noticeable benefit among the learners, NPAL should be applied in different Blocks, in all the SGDs. The small group's timings in first year should be scheduled after adjusting the timings of classes of second year so that the tutors do not suffer academically. The cognitive gain after using such strategy should be assessed in a modular or summative exam as theory or in practical.

Conclusion

This pilot study investigates experiences with Near peer-assisted learning in delivering complex anatomical concepts in an integrated curriculum, in small groups. Key findings indicate that learners are satisfied by Near peer tutors teaching ,same as faculty teaching, regarding concept building and comprehension of Anatomy and its correlation with Clinical sciences when they are taught by both in small groups though better cognitive results are seen in Near peer tutor taught groups. Teaching by an expert cannot be surpassed solely but can be supported by an adjunct teaching strategy to deliver difficult concepts in small groups.

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