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Faculty perspectives of small group teaching experience in medical school in Tamil Nadu

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Abstract:

BACKGROUND: The small group teaching (SGT) is gaining popularity in medical education since it improves the student's thinking capacity and aids knowledge retention. Several studies have been conducted to analyze students' attitudes regarding SGT. Faculty, on the other hand, have mixed perception about SGT methodology. Therefore, the main objective of this study was to explore medical faculties' perceptions of SGT effectiveness in the medical curriculum.

MATERIALS AND METHODS: A cross-sectional, descriptive survey was conducted among 50 medical college teachers. We have developed set of 12 questionnaires to assess the perception of teachers on SGT methods. Content validation of the survey questionnaire was done by Lawshe method, and Cronbach's alpha was calculated for estimating the internal consistency. Teacher's perception responses were presented as proportion and percentage. We performed principal component analysis, structural equation modelling, Chi-squared test (χ^2/df), goodness-of-fit index (GFI), adjusted GFI, comparative fit index, and root mean square error of approximation.

RESULTS: The validation resulted in the 12 items model indicated superior goodness of fit for sample data. All the extracted factors had good internal consistency of >0.9. Majority of the teachers strongly agreed that the SGT method enhances the student intrinsic motivation (n = 42, 84%), self-confidence (n = 40, 80%) self-directed learning (n = 35, 70%), and student teacher interaction (n = 38, 76%).

CONCLUSION: Teaching faculties' perception reflected that SGT is an effective method to impart knowledge to the students and also helps in improving their understanding of their subject. It helps in developing intrinsic motivation to do self-learning in the students. It also helps in developing good peer interaction and improves the communication skills.

Keywords:

Education, medical teachers, perception, teaching methods

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Introduction

Medical education needs continuous improvement to meet the demands of medical practice in the 21 century. It is critical to reform the medical education system to emphasis student engagement and interaction rather than formal lectures. In a university "classroom environment," a well-planned small group teaching (SGT) session provides a structured approach for both teachers and learners.[1] The SGT style helps students retain the subject for a longer period of time, making them independent and self-reliant. It also allows students to analyze their own learning ability.[2] This strategy enables students to get more professionally connected with patients, other healthcare professionals, community organizations, and learned societies.[3] Student engagement, information retention, self-directed learning, communication skills, collaborative ability, and peer discussion are all enhanced by effective SGT and learning practices. SGT is designed to be learner-centered rather

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than facilitator-centered.[4] Students' interest, teamwork ability, self-directed learning, and knowledge and skill retention improve when they are actively involved in their learning. SGT is the most challenging and sophisticated teaching style in medical school, and its success requires precise planning by faculty and students.[5] Several studies have been conducted to analyze students' attitudes regarding SGT.[4,6,7] Faculty, on the other hand, have conflicting attitude about SGT methodology. So this study aims to determine the perception of medical teachers on the SGT method among the first year undergraduate medical students.

Materials and Methods

Study design/setting

Item generation

Series of informal focus group meetings were held with Heads of the phase I departments of host institution, and discussion during all the meetings were transcribed verbatim in a word document. Qualitative experts in the institution performed thematic analysis and generated survey questionnaires to obtain the perception about SGT methods for the medical students as per the recommendation in the medical education.

Content validation

This was carried out by three internal and three external experts by Lawshe method.[8] The internal and external experts chosen were phase I department heads and medical educationists who were judiciously applying the medical education principles they had acquainted from within and outside our university, respectively. Agreement of minimum of five out of six experts is taken as acceptance for including that item in the survey questionnaire. The resultant survey had 12 closed ended questions measured on a Likert scale of 1 (strongly disagree) to 5 (Strongly agree) and three open-ended questions to capture perceptions regard to facilitating factors, hindering factors, and suggestions toward SGT.

Study participants

The research work was carried out after getting ethical approval from Institutional Ethics Committee (Ref. no: 002/SBMC/IHEC/2021/1536) from Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India. The study was carried out in 50 faculties who are handling the SGT method for undergraduate medical students. Written informed consent was obtained from all the participating faculties through Google forms.

Data collection

In our survey, there were 12 items about the attributes of effective SGT. The questionnaire was given to medical faculties of phase I departments all over Chennai, Tamil Nadu between May and October of 2021 through online platform (Google form). Participants were asked to rate the data on a five-point Likert scale (strongly agree = 5 to strongly disagree = 1) using a Google form.

Statistical analysis

For the descriptive statistics, percentage of respondents making each response, mean and standard deviation, and measures of skewness and kurtosis were computed for each questionnaire. The measures of skewness and kurtosis were examined for all items prior to conducting factor analysis to determine whether the items were normally distributed. To determine the internal consistency of the survey questionnaire, Cronbach's alpha of >0.70 is considered to be an acceptable reliability coefficient 19. Structural equation modeling (SEM) was performed to evaluate the relationship between the structural path and items using AMOS version 22. We have assessed global goodness of fit model indices for the confirmatory factor analysis (CFA) by R statistical version 4.0.2. These indices include χ^2 and its subsequent ratio with degrees of freedom (χ^2/df), goodness-of-fit index (GFI), comparative fit index (CFI), root mean square error of approximation (RMSEA); standardized root mean square residuals (SRMRs). Faculty perception about the small group discussion was presented as proportion and percentage.

Results

Out of 90 faculties contacted, 50 of them were responded for the survey (response rate of %). Majority of the faculty members were female (78%) and average age of 49.30 years with the range of 37–59 years [see Table 1]. Most of the faculties holds the post of professor (50%) and belongs to the Department of Physiology (64%) with more than 10 years of teaching experience (56%).

For the internal consistency of the survey questionnaire, Cronbach's ∝ was estimated and all the items had good internal consistency of ≥0.9. Normality assessment usually rejects if the ratio of skewness is > ± 1 and/or kurtosis is > ± 2.[9] The 12 items' distribution in this study is accepted because none of them deviates from normality [Table 2]. In Table 3, the significant χ^2 value (P = 0.001) does not imply support for the model. It can be interpreted as the model has a good fit for the observed data, but the P value for Chi-squared test in not significant. However, the empirical studies have shown that P value to be significant if the sample is large. Since chi squared test depends on the sample size, χ^2/df ratio will be the best index for the goodness of fit. A ratio <2 indicates a superior goodness of fit for the sample data. CFI (0.78), GFI (0.72), AGFI (0.71), NFI (0.89), SRMR (0.06), and RMSEA (0.09) values represent that the model fits to satisfactory Figure 1.

Out of the 50 faculties, 35 (70%) strongly agreed that "Small group teaching makes students comprehend concepts delivered in the lectures," 31 (61%) strongly agreed that it "enhances the student intrinsic motivation." On the other hand, 32 (64%) faculties considered that "Small group teaching is more effective way of teaching" and "creates interest to the students on the topic." Interestingly, 20 (40%) faculties have strongly agreed that "Small group teaching makes the students to frame learning objectives" and 22 (44%) faculties have agreed that "facilitates self-directed learning" among the students. Majority of the strongly agreed that the SGT method makes good students teacher interaction (n = 35, 70%), good peer interaction (n = 34, 68%), improves student's communication skills (n = 23, 46%), and encourages the student to be an active life long learner (n = 22, 42%) Table 4.

Table 1: Baseline characteristics of study participants

Characteristic	*n*=50
Gender	
Female	39 (78%)
Male	11 (22%)
Age (yrs)	49.30±8 (37-59)
<30	12 (22%)
30-40	10 (20%)
40-50	16 (32%)
>50	2 (4%)
Designation	
Assistant Professor	14 (28%)
Associate Professor	11 (22%)
Professor	25 (50%)
Department	
Anatomy	5 (10.0%)
Biochemistry	10 (20.0%)
Physiology	35 (64%)
Teaching Experience (years)	
<5	8 (16%)
5-10	14 (28%)
>10	28 (56%)

Discussion

The findings from this study showed SGT as an effective method to impart knowledge to the students from the medical teacher's perception.

From the perspective of students, there are numerous questionnaires available for SGT; however, to our knowledge, this is the first study to develop and validate a questionnaire specifically targeting SGT for medical teachers. The psychometric properties of the questionnaires used, as well as the fit calculation using the CFA approach, revealed that the model agrees with the data and provides the best fit. The pattern of interrelationship between all of the variables was revealed using SEM.

Several studies have found that SGT improves knowledge retention, increases opportunities to ask questions, improves learning to solve problems, improves transfer of concepts to new problems, increases students' interest, improves self-directed learning skills, improves ability to work as a team, improves student–faculty and peer–peer interaction, improves communication skills, and provides the opportunity to clarify points.[10,11] Despite the fact that the exposure to SGT is limited, the participants were generally satisfied with the concepts of SGT in medical education. They complimented it for boosting students' focus, stimulating student–teacher engagement, increasing students' confidence, improving students' presentation skills, and improving teacher–student relationships.[12] Many medical institutions across the world have embraced this teaching style to make classrooms more interactive and give students opportunity to participate in debates and discussions.[4,13] Small group discussions are beneficial to students' education because they allow them to express themselves and form tighter bonds with academic professionals.[14] Listening, presenting ideas, persuading, and working as part of a team are all abilities that can be developed through discussion. Students in SGT can monitor their

Table 2: Descriptive statistics for the perception questionnaires used in the survey

Items	*n*	Mean	SD	Skewness	Kurtosis
Q1. Small group teaching makes students comprehend concepts delivered in the lectures	50	3.76	1.222	-0.498	-1.104
Q2. Small group teaching enhances the student intrinsic motivation	50	3.26	1.192	-0.002	-1.173
Q3. Small group teaching is more effective way of teaching	50	3.66	1.319	-0.446	-1.074
Q4. Small group teaching creates interest to the students on the topic	50	3.64	1.045	-0.333	-0.567
Q5. Small group teaching makes the students to frame learning objectives	50	3.5	1.216	-0.85	-0.062
Q6. Small group teaching facilitates self-directed learning	50	3.54	0.973	-0.048	-0.931
Q7. Small group teaching makes good students teacher interaction	50	3.86	1.088	-0.998	0.859
Q8. Small group teaching makes good peer interaction	50	4.5	0.863	-1.984	4.42
Q9. Small group teaching improves student's communication skills	50	4.36	0.827	-1.899	5.18
Q10. Small group teaching improves the self-confidence among the students	50	3.8	0.808	-0.822	1.887
Q11. Small group teaching improves the student's presentation skills	50	3.76	0.938	-0.419	0.123
Q12. Small group teaching encourages the student to be an active life long learner	50	3.52	1.035	-0.401	-0.123

own learning and build a sense of self-direction and independence in their studies.[15,16]

We were unable to compare our findings to those of previous studies because no studies on the development and validation of questionnaires using the CFA and SEM approaches, specifically designed to address SGT, have been published. This 12-item model is a valid and reliable tool, and we encourage all academicians and researchers to consider using it in all medical colleges in India, so that the data collected from a large sample of medical teachers can be used to make recommendations to the national medical council to transform the existing SGT methods.

Hence, SGT is flexible and reactive; teachers can modify their approach to instruction to match the specific requirements of students. Lower ability students benefit the most from SGT with higher ability students, while medium ability students benefit from mixed ability groupings as well. So the teacher's role is important in moderating group dynamics and establishing the suitable attitude within a group for effective learning. Institutional and social challenges, on the other hand, can combine to make SGT less successful and rewarding than it should be. However, there are strategies to overcome these obstacles and ensure that SGT is an inspiring, memorable, and productive experience.

Conclusion

In conclusion, small group learning sessions are a better way to develop learning behavior among the students. The faculties also highly recommended SGT irrespective of their discipline. A positive experience was articulated by faculty members as well as the outcomes of their medical school's efforts to introduce instruction in smaller groups. The teaching activities should be in small groups in a recognizable pattern and, ideally, be organized in order to maximize learning and participation by students.

Table 3: Confirmatory factor analysis for the perception questionnaire

χ^2	RMSEA	TLI	CFI	GFI	χ^2/df	*P*
181	0.06	0.86	0.82	0.87	3.35	0.0001

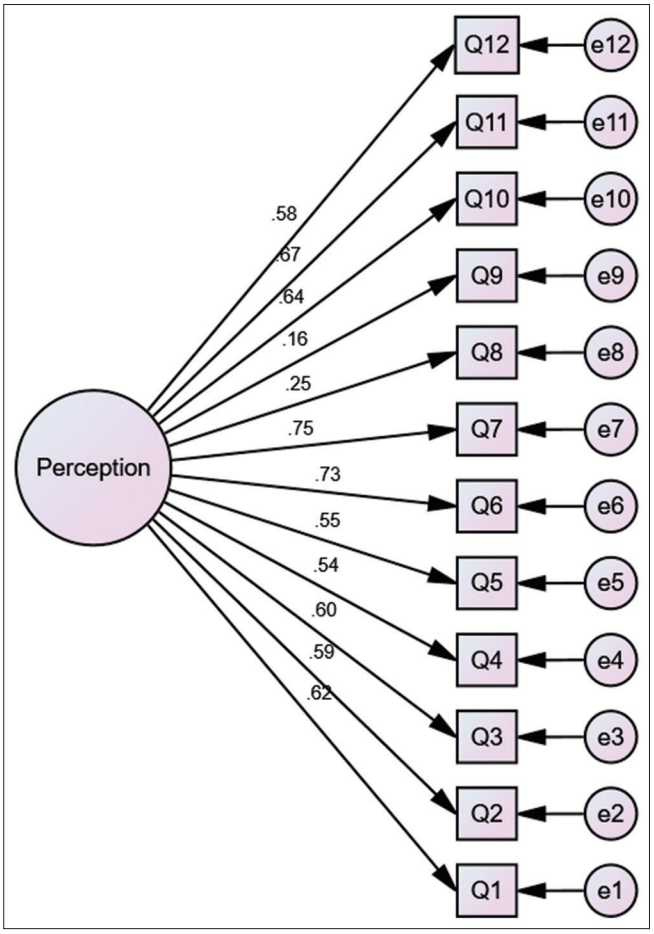

Figure 1: SEM path for the items used in the survey

Table 4: Teachers response for the survey about small group teaching

Perception questionnaire	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
Q1. Small group teaching makes students comprehend concepts delivered in the lectures	35 (70%)	15 (30%)	-	-	-
Q2. Small group teaching enhances the student intrinsic motivation	31 (62%)	14 (28%)	5 (10%)	-	-
Q3. Small group teaching is more effective way of teaching	32 (64%)	12 (24%)	5 (10%)	1 (2.0%)	-
Q4. Small group teaching creates interest to the students on the topic.	32 (64%)	16 (32%)	2 (4.0%)		-
Q5. Small group teaching makes the students to frame learning objectives	20 (40%)	16 (32%)	10 (20%)	4 (8.0%)	-
Q6. Small group teaching facilitates self-directed learning	22 (44%)	23 (46%)	4 (8.0%)	1 (2.0%)	-
Q7. Small group teaching makes good students teacher interaction.	35 (70%)	11 (22%)	4 (8.0%)	-	-
Q8. Small group teaching makes good peer interaction	34 (68%)	15 (30%)	1 (2.0%)	-	-
Q9. Small group teaching improves student's communication skills	28 (56%)	22 (44%)	-	-	-
Q10. Small group teaching improves the self-confidence among the students	23 (46%)	21 (42%)	6 (12%)	-	-
Q11. Small group teaching improves the student's presentation skills	24 (48%)	16 (32%)	9 (18%)	1 (2.0%)	-
Q12. Small group teaching encourages the student to be an active life long learner	22 (42%)	18 (36%)	9 (18%)	1 (2.0%)	-

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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