

Impact of a Residential Rural Community-Based Training Program for Medical Students on Cognitive and Affective Domains of Learning in Community Medicine: A Mixed Methods Study

Farah Naaz Fathima, Avita Rose Johnson, Pretesh Rohan Kiran, S. Ratnakumari, Bobby Joseph

Department of Community Health, St. John's Medical College, Bengaluru, Karnataka, India

Abstract

Introduction: As part of undergraduate training in community medicine, students of 1st-year MBBS at our medical college in South India undergo rural residential community-based training called Rural Orientation Program (ROP). **Objective:** The objective was to study the impact of ROP at a medical college in South India. **Methodology:** Short-term impact was studied immediately before and after ROP using a 30-item questionnaire administered to 142 students. Medium-term impact was studied among 23 students in 2nd-year MBBS. Quantitative component consisted of objective structured practical examination scores and qualitative component documented reflections on learnings. Long-term impact was studied by surveying 287 alumni (batches of 1979 onward) to explore the impact of ROP on their career. **Results:** We found a significant ($P < 0.001$) improvement in the median posttest score (21, interquartile range [IQR]: 20–23) when compared to pretest (12, IQR: 10–16). The mean OSPE score was 19.34 ± 3.19 (maximum score = 25) with 54.55% obtaining a score ≥ 20 . Thematic analysis of reflections depicted that students gained insights on factors influencing health and social organizations in rural areas. ROP helped develop empathy toward patients and a holistic approach toward health, in understanding rural dynamics and improved communication skills. **Conclusion:** ROP increases subject knowledge and plays a role in molding attitudes of students toward the care of people in rural areas and improves communication skills. This time-tested model can be replicated in other medical colleges across the country.

Keywords: Community based, impact, medical students, mixed methods, rural residential training

INTRODUCTION

Community-oriented medical education is the delivery of medical education in a specific social context where the community is the learning environment. Students, teachers, and community members are actively engaged in educational experiences that are relevant to community needs.^[1,2]

According to the World Health Organization and World Federation for Medical Education, medical education which is focused on health needs of the community is effective in an understanding of medico-social determinants of health. In contrast to predominant hospital-based training, community settings provide holistic learning.^[3]

About two-thirds of the total population of India reside in rural areas and constitute majority of patients visiting hospitals. It

is imperative that medical students know ways of life in rural areas.^[4]

Our institution is a medical college in South India that has been providing community-oriented rural residential training to its undergraduate students. Rural Orientation Program (ROP) is a rural residential program of 1-week duration for 1st-year medical students which has been held for over 40 years, from

Address for correspondence: Dr. Avita Rose Johnson,
Department of Community Health, St. John's Medical College,
Bengaluru - 560 034, Karnataka, India.
E-mail: avitajohnson@gmail.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Fathima FN, Johnson AR, Kiran PR, Ratnakumari S, Joseph B. Impact of a residential rural community-based training program for medical students on cognitive and affective domains of learning in community medicine: A mixed methods study. *Indian J Community Med* 2021;46:247-51.

Received: 29-06-20, **Accepted:** 08-02-21, **Published:** 29-05-21

Access this article online

Quick Response Code:



Website:
www.ijcm.org.in

DOI:
10.4103/ijcm.IJCM_545_20

even before the Medical Council of India's Graduate Medical Education Regulations came into force.^[5] ROP aims to impart value-based education, so that medical students, who are the doctors of tomorrow, see the realities of rural India, thus making them sensitive to health needs of persons in rural areas. Over the years, although the program has undergone changes in its content, the aim of the program has remained constant.

During ROP, the "family study" and "community study" components enable students to interact with village folk and learn about rural life. Students are divided into groups of 8–10, and each group is allotted a topic ranging from village life, housing, food habits, folk arts and festivals, occupation and village governance, health, education and other facilities in the village, child-rearing practices, village organizations like self-help groups, etc. Students prepare a topic guide with open-ended questions and probes in local language. A daily review and presentation of field activities helps students to improve communication skills. "Monsoons" – a simulation exercise on dynamics of poverty in an imaginary village in India – puts students in the homes and social situations of farmers through which they understand the difficulties and dilemmas faced by rural folk. Students take on roles of farmers and their families, money-lender, development worker, and village thug. Dependence on monsoons, cooperation and leadership within the village, polarization of rich and poor, role of money-lender and development worker, effect of lack of irrigation, malnutrition and its consequences, and pressures of social conformity with regard to marriage are some of the issues raised in the game.^[6] In the session on nutrition demonstration, students procure raw food items from the village market and cook common nutritious foods followed by a discussion on nutritive value, cooking practices, and cultural practices related to the food item. The "child-to-child" program trains students to teach schoolchildren's common health issues and gives medical students' hands-on experience in the application of this method of delivering a health education message.^[7] Medical students are divided into small groups, and each group selects a topic for health education based on their experiences in the field. The community program provides a unique opportunity for students to plan, prepare, and present an educational program based on the observation during the field study and includes an amalgamation of cultural activities including dramas, street plays, songs, talks, and exhibitions. A module for step by step implementation of ROP has been prepared to ensure quality and standardization of instruction.^[8]

Out of more than 500 medical colleges in India, very few conduct community-based rural residential training for undergraduate students. Mahatma Gandhi Institute of Medical Sciences has a program where 1st-year students adopt a village where each student is allotted 4–5 families. M S Ramaiah Medical College organizes a 2-week community orientation program for 1st-year medical students. All India Institute of Medical Sciences, New Delhi, runs a rural residential training program for undergraduate students. Christian Medical College (CMC), Vellore, has been running a 3-week

community orientation program. Some newer medical colleges in Kerala, such as Malankara Orthodox Syrian Church Medical College, Kochi; Somervell Memorial CSI Medical College, Karakonam; and Government Medical College, Thiruvananthapuram, have started community programs based on the CMC model.^[9–11] Our institution is probably the only institution that has systematically studied the impact of its rural residential program in a research mode. The objective of this paper is to study the impact of the ROP in a medical college in South India.

METHODOLOGY

We studied the impact of ROP using mixed methods (Institutional Ethics Committee 18/2018) after obtaining informed consent from participants.

Short-term impact

Short-term impact was studied using a structured questionnaire consisting of 30 multiple-choice questions (cognitive domain) administered to the entire batch of students immediately before and after ROP. Scoring was by allotting one point for every correct response.

Medium-term impact

A study of medium-term impact had a quantitative and a qualitative component and was done 6 months after ROP.

Quantitative component was studied on a subset of students who underwent an objective structured practical examination (OSPE) to assess their attitude and communication skills (affective domain) while interacting with a simulated rural patient. Four OSPE scenarios were developed based on topics covered in ROP (total score of 25), and the scores obtained by the students were categorized as high (≥ 20), medium (15–19), and low (0–9).

Qualitative component documented reflective narratives by students (affective domain) on their learning from ROP.^[12]

Long-term impact

Long-term impact of ROP was studied among current and past medical students of the institution (batch of 1979 onward) who had experienced ROP from a list procured from college alumni records. We used a semi-structured questionnaire (affective domain) that was administered electronically and included questions on their perspectives on ROP and how it influenced their professional career.

Sample size

- For short-term impact – 142 students (one MBBS batch)
- For medium-term impact – 23 students (one clinical batch during their posting in community medicine in the 2nd year)
- For long-term impact – 287.

In the absence of previous studies on the topic, we estimated sample size based on the assumption that 75% of respondents would report that ROP was useful. Using 0.75 as an estimate

of prevalence of usefulness of ROP, at a confidence level of 95%, an absolute precision of 5%, and a correction for a finite population size of ≈ 2400 (40 batches since 1979 with 60 students per batch, 150 per batch from 2016), the minimum sample size estimated for the online survey was 258. However, we analyzed all the 287 completed responses that we received.

Data analysis

Quantitative data were entered in Microsoft Excel and analyzed using standard statistical packages. Outcome measures studied included knowledge gained (test scores), change in attitude and communication skills (OSPE scores), and usefulness of ROP (online survey). Descriptive statistics such as frequencies, percentages, mean and standard deviation, median, and interquartile range were used to describe the characteristics of the study participants and outcome measures. Data were checked for normality using Shapiro–Wilk test. The differences in the median pre- and posttest scores were analyzed using Wilcoxon signed-rank test. The changes between the three categories for pre- and posttest scores were analyzed using McNemar–Bowker test. Mann–Whitney *U*-test was used for gender and rural–urban differences in test scores. $P < 0.05$ was considered as statistically significant for all analyses.

For analysis of the qualitative component, reflective narrations by the students were analyzed thematically by coding responses and categorizing them into themes and subthemes.

RESULTS

Short-term impact

The mean age of 142 students was 20.46 ± 2.98 years. Majority were females (61.81%) and had completed schooling from urban areas (83.33%).

The median posttest score (21, interquartile range [IQR]: 20–23) was significantly higher (Wilcoxon signed-rank test, $P < 0.01$) than pretest score (12, IQR: 10–16) with a median increase of 8 points (IQR: 5–11). Posttest scores of female students were significantly higher than those of male students (Mann–Whitney *U*-test, $P = 0.03$). There was no difference in posttest scores among students who had schooling

in rural and urban areas. The pre- and posttest scores of the students are depicted in Table 1.

Medium-term impact

Quantitative component

The mean OSPE score was 19.34 ± 3.19 (maximum score = 25) with 54.55% obtaining a score of ≥ 20 .

Qualitative component

Thematic analysis of the reflective narratives depicted that key learnings from ROP were that students gained insights on factors influencing health and social organizations in rural areas. ROP helped students become empathetic toward patients and helped develop a holistic approach toward health. The main themes that emerged from reflective narrations and some verbatim quotes are summarized in Table 2.

Long-term impact

Around half of the 287 respondents (52.6%) were MBBS batch 2009 onward, a quarter (25.1%) were from batches 1999 and 2009, one-eighth (12.5%) were from batch 1989–1999, and one-tenth (9.8%) were from the batches of 1979–1988.

Among the respondents, 108 (37.6%) were current undergraduate students who had experienced the ROP at least 2 years earlier, 4.2% had re-joined our institution as postgraduate students, and 8.4% had re-joined as faculty. Out of 179 respondents who graduated from our institution, 103 (57.2%) had served in rural areas post-MBBS. Among those who had served in rural areas, more than half reported that ROP had played a role in their decision to serve in a rural setting.

Among the 287 respondents, an overwhelming majority (98.3%) felt that ROP should be continued for future MBBS batches and 96.9% felt that similar programs should be held in other medical colleges. Table 3 depicts the perspectives of respondents on ROP. Majority felt that ROP provides an opportunity for medical students to interact firsthand with rural communities, helps them to understand prevailing conditions, and enables understanding of health and factors influencing it. In addition, respondents felt that ROP improves communication skills and team building. Respondents disagreed that the ROP was only fun and games without any learning.

DISCUSSION

ROP aims at sensitizing medical students to realities of rural India, thus making them sensitive to the health needs of persons in rural areas.

The advantages that a program like ROP offers to student learning are manifold. It exposes students to the realities of rural life and helps them appreciate local culture and tradition. It enables medical students to think beyond the patient and gives them firsthand experience on factors influencing health. It provides an opportunity for students to understand the role of

Table 1: Short-term impact pre- and posttest scores

	Pretest score, n (%)	Posttest score, n (%)
Low (0-9) *	25 (17.6)	1 (0.7)
Medium (10-19)	109 (76.8)	32 (22.5)
High (≥ 20)	8 (5.6)	109 (76.8)
Average score (median, IQR)		
Total **	12 (10-16)	21 (20-23)
Males ***	12 (9-16)	21 (18-22)
Females	13 (11-16)	22 (20-23)

* $p < 0.001$, McNemar–Bowker test, ** $p < 0.05$, Wilcoxon signed-rank test, *** $p < 0.05$, Mann–Whitney *U*-test for post test scores by gender. IQR: Interquartile range

Table 2: Medium-term impact-thematic analysis of reflective narratives by the students

Theme	Subtheme	Verbatim quotes
Main learning from ROP	Determinants of health and disease	<p>“Lack of awareness, superstitions, illiteracy hamper people accessing health care services before it is too late”</p> <p>“Some families still follow certain beliefs and practices that may be harmful to their health”</p> <p>“Enlightened me about the availability of highly nutritious food items that can be easily prepared at home”</p> <p>“Economic status of the people and the difficulties faced by them in obtaining medical care”</p>
	Social organizations	<p>“There are many social groups which help to promote health among villagers”</p> <p>“I learnt about the role of the panchayat for health in the community”</p> <p>“Importance of grass root level health workers in promoting and maintaining the health of the community”</p>
Implications of learnings from ROP	More empathy toward patients	<p>“In future when we become doctors we will have a better picture of rural area and the difficulties that people have to face to get proper health care”</p> <p>“To become a good doctor, it is necessary to be simple, humble and polite. I can now relate to the patient on a much deeper level and create good doctor patient relationship”</p> <p>“To be more caring, compassionate and understanding toward patients, especially the poor. I will be able to put myself in the shoes of my patients and to understand the patient’s side of the story and make better decisions to help them”</p>
	Holistic care to patients	<p>“I will be able to tell the people about the various governmental health schemes”</p> <p>“Being a tap turner and finding out the root cause of diseases. As future doctors we have to not only cure diseases but also prevent diseases”</p> <p>“To be cost-effective in prescribing treatment”</p>

ROP: Rural Orientation Program

Table 3: Long-term impact perspectives of respondents on Rural Orientation Program

Perspectives on ROP	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
ROP helps to improve communication skills among medical students	6 (2.1)	5 (1.7)	25 (8.7)	127 (44.3)	124 (43.2)
ROP helps medical students to understand the general conditions prevailing in the rural areas	3 (1.0)	6 (2.1)	16 (5.6)	115 (40.0)	147 (51.2)
ROP provides an opportunity for medical students to interact firsthand with a rural community	3 (1.0)	1 (0.3)	7 (2.4)	106 (36.9)	170 (59.2)
ROP creates awareness and understanding regarding the health status in rural area	4 (1.4)	3 (1.0)	19 (6.6)	143 (43.8)	118 (41.1)
ROP helps in understanding factors influencing health in rural areas	3 (1.0)	3 (1.0)	18 (6.3)	146 (50.9)	117 (40.8)
ROP helps medical students to understand the cultural factors in health and disease	3 (1.0)	3 (1.0)	21 (7.3)	141 (49.1)	119 (41.5)
ROP helps in team building	3 (1.0)	4 (1.4)	18 (6.3)	104 (36.2)	158 (55.1)
ROP is all fun and games with no learning	14 (33.7)	156 (54.4)	18 (6.3)	10 (3.5)	6 (2.1)

ROP: Rural Orientation Program

individuals and groups who provide health-related services in communities. It ensures training in teamwork, communication skills, and leadership, which are qualities desirable in doctors. All these result in production of better doctors who understand the patient and the community which the patient is a part. Students staying on the Rural Health Training Centre (RHTC) campus get an opportunity to observe clinical activities and interact with patients and resident doctors.

While there is some evidence from developed countries to document the success of community based training programs, there is a dearth of similar studies from India.^[13-19] Study participants in these studies include general practitioners and not medical students. A critical review of North American studies found that rural experiences influenced students toward primary care specialties and rural practice. Students generally valued the experience and had a high degree of satisfaction. Although evidence supports the role of rural training in influencing practice site and career choice, it is not clear whether they reinforce preexisting interest or have ability to

motivate previously uninterested students to consider careers in primary care or rural medicine.^[18] Published literature from India on similar programs in other medical colleges is limited to descriptive points of view of faculty and students.^[9,10] We did not find studies that generate evidence on the effectiveness of rural training for medical students.

Acceptance of students by the local community and their participation in our program may be challenging and can be addressed by building and ensuring good rapport with community members and leaders. Decade of trust in the ongoing service activities of our RHTC is a strong positive factor. Meetings are held before each ROP with local leaders to discuss student activities in villages, and village panchayat provides logistic support for the community program.

The RHTC should have facilities for 50 students at a time to implement this program. Students are posted in three batches of 50 students each, and sessions must be repeated thrice. This issue was addressed by joint planning with other departments

in the same MBBS phase.

Faculty members should be enthusiastic to reside at RHTC. Since the program is being run since 1979, residential postings for faculty and students have become a part of the culture at our institution.

Finally, institutional support is of paramount importance for logistics support. The program is in line with the objectives of the institution and is hence supported by the management. A small amount collected as a part of the fees helps in meeting expenses incurred to run the program.^[8]

We used multiple methods to assess the impact of ROP including reflective narratives. Analysis of reflective narratives is an accepted technique in educational research.^[12] We chose this technique for assessment of long-term impact because study participants were at remote locations in different parts of the world and could not be physically present for interviews. The use of conventional qualitative research techniques such as focus group discussions and in-depth interviews could have yielded richer data and could be viewed as a limitation of our study.

CONCLUSION

The vast experience of four decades at our institution shows that rural residential training plays a role in improving the quality of student learning. This is backed by data that show that rural residential training not only increases subject knowledge but also plays a role in molding attitudes of students toward the care of people in rural areas and improves communication skills. Significant improvement in the posttest scores depicts an immediate increase in knowledge levels of the students. High scores at the OSPE scenarios depict the good application of the knowledge gained and good retention of learnings. Reflections on program by the students showed that it brought about positive change in attitudes. These learnings have long-term impact in shaping careers of future doctors.

This time-tested model can be replicated in other medical colleges across the country.

Acknowledgment

- Management, St John's National Academy of Health Sciences
- Heads of Department and faculty members of Department of Community Health, St. John's, from 1979 till date.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Kelly L, Walters L, Rosenthal D. Community-based medical education: Is success a result of meaningful personal learning experiences? *Educ Health (Abingdon)* 2014;27:47-50.
2. Farnsworth TJ, Frantz AC, McCune RW. Community-based distributive medical education: Advantaging society. *Med Educ Online* 2012;17:8432.
3. WHO-WFME Task Force on Accreditation. Accreditation of Medical Education Institutions Report of a Technical Meeting. Geneva: WHO; 2004.
4. Registrar General and Census Commissioner, Rural Urban Distribution of Population Census of India 2011 (Provisional Population Totals). New Delhi : Government of India 2011; available at https://censusindia.gov.in/2011-prov-results/paper2/data_files/india/paper2_1.pdf. [Last accessed on 2020 Jun 29].
5. Medical Council of India. Regulations on Graduate Medical Education. New Delhi: Medical Council of India; 1997.
6. Staley J. Monsoon Simulation Game. SEARCH1981. Available from: <https://www.tear.org.au/resources/tear-simulation-games>. [Last accessed on 2020 Dec 09].
7. Webb JK, World Health Organization. Health Education Service and United Nations Children's Fund (UNICEF). Health Education for School-Age Children: The Child-To-Child Programme; 1985. Available from: <https://apps.who.int/iris/handle/10665/626>. [Last accessed on 2020 Jun 29].
8. St. John's Medical College, Bangalore. St John's National Academy of Health Sciences. Prospectus; 2019-2020. p. 16. Available from: <https://www.stjohns.in/images/standarduploads/St%20Johns%20Medical%202019%20Prospectus.pdf>. [Last accessed on 2020 Jun 29].
9. Okayama M, Kajii E. Does community-based education increase students' motivation to practice community health care? – A cross sectional study. *BMC Med Educ* 2011;11:19.
10. Chowdhary S. Learning with the community: An enriching experience. *Int J Med Stud* 2017;5:81-3. Available from: <http://paperity.org/p/80064306/learning-with-the-community-an-enriching-experience>. [Last accessed on 2020 Jun 29].
11. Joseph MR. Experience from Community Living Programme. Available from: https://www.researchgate.net/profile/Marina_Joseph/4/publication/266159750_Experience_from_community_living_programme_adapted_from_community_orientation_programme_of_CMC_Vellore/links/595c8770f7e9bf415b4bc33/Experience-from-community-living-programme-adapted-from-community-orientation-programme-of-CMC-Vellore.pdf. [Last accessed on 2020 Jun 29].
12. Moen T. Reflections on the narrative research approach. *Int J Qual Methods* 2006;5:56-69. Available from: <https://journals.sagepub.com/doi/10.1177/160940690600500405#article> Citation Download Container. [Last accessed on 2020 Dec 09]; [doi: 10.1177/160940690600500405].
13. Sopoaga F, Zaharic T, Kokaua J, Covello S. Training a medical workforce to meet the needs of diverse minority communities. *BMC Med Educ* 2017;17:19.
14. Eidson-Ton WS, Rainwater J, Hilty D, Henderson S, Hancock C, Nation CL, *et al.* Training medical students for rural, underserved areas: A rural medical education program in California. *J Health Care Poor Underserved* 2016;27:1674-88.
15. Grobler L, Marais BJ, Mabunda S. Interventions for increasing the proportion of health professionals practising in rural and other underserved areas. *Cochrane Database Syst Rev* 2015;6:CD005314.
16. Dolea C, Stormont L, Braichet JM. Evaluated strategies to increase attraction and retention of health workers in remote and rural areas. *Bull World Health Organ* 2010;88:379-85.
17. World Health Organization. Increasing Access to Health Workers in Remote and Rural Areas through Improved Retention: Global Policy Recommendations. Available from: http://whqlibdoc.who.int/publications/2010/9789241564014_eng.pdf. [Last accessed on 2015 Jun 17].
18. Viscomi M, Larkins S, Gupta TS. Recruitment and retention of general practitioners in rural Canada and Australia: A review of the literature. *Can J Rural Med* 2013;18:13-23.
19. Barrett FA, Lipsky MS, Nawal LM. The impact of rural training experiences on medical students: A critical review. *Acad Med* 2011;86:259-63.