



## **Assessment of PAM (Pesticide Awareness Module) as Community Teaching Tool**

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### **Authors' contributions**

*This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/JPRI/2021/v33i60B35096

### **Open Peer Review History:**

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/80742>

**Original Research Article**

**Received 20 October 2021**  
**Accepted 27 December 2021**  
**Published 28 December 2021**

## **ABSTRACT**

**Background:** The ability of students to understand and support the needs of the community is at the heart of community-based education. Because India is a developing country with a large proportion of the population living in villages, the medical education system must guarantee that learners who serve as health care providers acquire the necessary skills and venture out into the community as needed. In today's scenario pesticide poisoning in farmer's communities is an issue of high concern with this aim PAM (pesticide awareness module) is designed and is assessed as a community teaching tool. The pesticide Awareness module (PAM) was prepared as per the need of the community. The pretest of the student was conducted. Module was implemented by the student in the community with Flex, Charts, and Video. After implementation of the module post-test of students was conducted after one month. With the help of a Checklist, students were assessed for community teaching. Students' perception of community teaching was obtained using a feedback questionnaire. The average Pre-test score was 23.35% and in Post-test it was increased to 86.85%. This indicates students gain desired level of knowledge for a longer period & Students also get benefitted by acquiring self-confidence, behavioral and attitudinal skill. The intervention of PAM as a community teaching tool was highly effective for the student in gaining knowledge & different skills.

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*Keywords: Pesticide; awareness; module; community; knowledge.*

## 1. INTRODUCTION

Motivated by the need for medical schools to reflect the requirements of future healthcare systems, and to ensure that doctors in training acquire appropriate aptitudes (Boelen, 1993), there has been a worldwide trend to reform medical education. Diverse educational approaches are always being developed, tested, and applied [1]. Among these one consistent approach has been emphasising the balance between university and the hospital with more use of the community as a learning setting. In response to significant changes in the aetiology, manifestation, and location of sickness management, many medical schools are increasingly focusing on the community as a source of curriculum and instruction [2]. The delivery of health education in a social environment is known as community-based education [3]. Community-Based Medical Education focuses on the community where most health problems can be prevented or treated. In community-based activities, the community provides a learning environment for medical education that is relevant to community needs. It is a set of learning activities that takes place outside the classroom and utilize the community extensively as a learning environment [4]. The communities involved may be urban, peri-urban or rural, central or isolated. Students, teachers, community members and representatives of health and other sectors, ideally, are actively engaged throughout the education experience [5]. Students can learn, practice, and apply subject matter knowledge and skills through community-based learning. Students develop the knowledge, abilities, and characteristics of successful citizenship at the same time by identifying and acting on issues and concerns that influence their local communities. It helps the student to learn by observation and develop communication and leadership skills [6]. It has been described as a “win-win” situation where students gain real-world experience and the community is provided with extra services [7].

Today more and more toxic organic and inorganic compounds are entering the environment due to the intensive development of agriculture. Pesticide poisoning is an important issue in the farming community, thus to meet the important requirement of the farming community about the dangerous effects of pesticides, there should be a proper PAM.

Graduates from health profession institutions know little about this problem. CBE can contribute significantly to solving such pertinent problems of the rural community. This study was carried out to evaluate the perception of students about community-based learning and assess the student about community-based teaching by checklist.

## 2. METHODOLOGY

The pesticide Awareness module was designed as per the need of rural communities. The curriculum was then applied by six postgraduate students in the rural community of six villages adjacent to Wardha district using easy sampling. Sensitization of student about PAM was done before implementation of the module in the community. Pre-Test and Posttest of the student were conducted to determine the knowledge gained about the module.

### 2.1 Questionnaire to Evaluate Student's Perception about Community Teaching

To assess students' perceptions of community-based education, a questionnaire with a 5-point Likert scale was developed and validated. Total ten items were prepared to record students' feedback about the teaching of PAM in the community. It was pre-validated and after validation was administered to all six participant to obtain their views immediately after the intervention.

A five-point Likert scale (1+ Strongly Agree to Strongly Disagree) was used to record responses for items 1-10 . Item no. 11 was the open-ended question where students were asked to comment on PAM modules as community teaching tools and suggestion to improve the module.

### 2.2 Checklist to Assess Students for Community Teaching

A checklist was prepared to assess the student for community teaching. 5 point Likert scale was used (1= Excellent, 2= Very Good, 3=Good, 4=Average,5= Poor) to assess student in community teaching for items 1 to 9.

### 2.3 Data Analysis and Statistics

To study the effectiveness of the module, pre-test and post-test scores of student were

compared for learning gain. Paired t-test was used to compare pre-test and post-test scores in the study group. Perception of student was assessed by analyzing the feedback. Response to close-ended and open-ended question were analyzed quantitatively and qualitatively. Assessment of student was done by checklist.

### 3. OBSERVATION AND RESULT

#### 3.1 Pre-test and Post-test Analysis of the Student

Table 1 is showing the data of Pre and post-test score of Students. It is observed that all students had less score (average 23.35%) in pre-test and it is significantly increased in post-test (average 63.35%).

Highly significant change is detected in pre and post-test score of students which represent the significant improvement in selected students by Pesticide Awareness Module.

#### 3.2 Feedback on Community-based Learning

##### 3.2.1 Analysis of close-ended question

It was noted that all students agreed on question number 1 and 4 while the maximum proportion of strongly agree is found in question number 6. No student was neutral or showed disagreement in all questions.

#### 3.4 Analysis of Open-ended Question

##### 3.4.1 Assessment of student by checklist

Assessment of Student by checklist is shown in Table 5. It was found that all students showed very good result in all studied parameters while among 6 students, only 2 students failed to achieve excellent result. No student was in average and poor category. Proportion of good and excellent result was same except questions related to Communication skill with the audience, Speech and Maintain cultural behaviour; where proportion of "Good" result is higher than "Excellent" result.

In both the parameters all students showed score not less than 60 %. Obtained satisfactory score is representing suitability of selected students for the teaching programme.

## 4. DISCUSSION

Strengths and shortcomings of an educational intervention can be identified by measurements of curricular effectiveness and help delineate the individual students progress along the competency curve between novice, advanced beginner, proficient provider, and competent provider [7]. On Analysis of the close-ended questions, the average rating score for students perceptions ranged between strongly agree and agree. All of the students agreed that CBL provides more possibilities to learn about social, cultural, and ethnic aspects of medical practice than hospital-based education [8]. According to Kaufman et al. students can learn about the variety of social, political, and economic elements that underpin ill health in our society by attending training in rural areas. Students are exposed to an atmosphere that is similar to what they will confront later in their professional lives, allowing them to become acclimatized to the severe conditions, which will help them handle future problems and change their mindset about communal life. They perceive the community as a platform for learning that is compatible with established learning theories, such as contextual or situated learning.. 100% of the students perceived that CBL really helpful to improve the communication skill, it fosters confidence and it will develop interest to work in rural places..This is supported by the According to research conducted in Ghana, South Africa, and Uganda, the decision to 'go rural' is not automatic, but is aided by other factors such as awareness of rural needs, role modelling, and exposure to rural training [9,10,11]. The significance of this discovery is that there is some evidence that Community-Based Education and Service (COBES) can be used to prepare and acclimate healthcare professionals to work in rural areas, as well as to achieve equity in the distribution of health professionals to benefit rural communities [12,13]. 100% of the student was agreed that CBL will help to develop sense of responsibility towards community as they were interacted with community. It train the student to work together as a multidisciplinary team and it also develop the leadership skill among student . During CBME, students begin by acquiring knowledge and abilities at the informative level. Students progress to the level of formative learning through socializing them around values and attitudes. Students then progress to transformative learning. Students gained knowledge through hands-on experience in

**Table 1. Pre and post-test score of Students**

Student No.	Pre – test	Post-test	Post-test	Post-test%	Change	% Change
S1	3	15%	17	85%	14	70
S2	5	25%	18	90%	13	65
S3	7	35%	18	90%	11	55
S4	6	30%	15	75%	09	45
S5	4	20%	18	90%	14	70
S6	3	15%	18	90%	15	75
Average	4.67	23.35%	17.33	86.85%	12.67	63.35

**Table 2. Statistical analysis of Pre & Post-test score by paired t test**

Test	N	Mean	SD	SEM	t value	p value
Pre-test	6	4.667	1.633	0.667	-13.784	<0.001***
Post-test	6	17.333	1.211	0.494		
Difference	6	-12.667	2.251	0.919		

\*\*\*Highly Significant

**Table 3. Students perception – Analysis of close-ended questions**

	Close-ended Question /Grade	SD	D	N	A	SA
1	Learning is attained through concrete experience	0	0	0	6 (100%)	0
2	CBL really helpful to improve the communication skill, Leadership skill	0	0	0	3 (50%)	3 50%
3	CBL foster the confidence	0	0	0	4 (66.66%)	2 33.33%
4	CBL will develop interest to work in rural place	0	0	0	6 100%)	0
5	CBL will help to develop sense of responsibility towards community	0	0	0	4 66.66%	2 33.33%
6	CBL provides more possibilities to learn about social, cultural, and ethnic aspects of medical practise than hospital-based education.	0	0	0	2 33.33%	4 66.66%

	<b>Close-ended Question /Grade</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>
7	CBL train to work together as a multidisciplinary team	0	0	0	3 50%	3 50%
8	Student efforts are recognized by their Peers and community they serve	0	0	0	3 50%	3 50%
9	Time allotment was adequate	0	2	1	2 33.33%	1 16.66%
10	Module is informative and self explanatory ,enhanced understanding of the subject	0	0	0	5 83.33%	1 16.66%

**Table 4. Students perception – Analysis of open-ended question**

<b>SN</b>	<b>Open-ended Question</b>	<b>Observation</b>
1	In which manner Community-based learning programs helped you to enhance your learning?	The student opined that it give good experience. The community acts as a learning platform, where interaction with people from various cultural backgrounds aids in the improvement of communication, clinical, and social skills, all of which are useful in future practise.
2	What is the strength of PAM in community teaching?	As pesticide poisoning is the severe issue among farmers community , teaching through PAM module enhance the knowledge of community and make them able to protect themselves from poisoning effects. Teaching the module with charts and video creates good visual impact.
3	What are the limitations of CBT programme ?	More time consuming
4	What are your suggestions to improve the programme?	Careful and thorough planning is essential to improve the programme.

**Table 5. Assessment of Student by checklist (n = 6)**

Sr no.	Question	Excellent %	Very good %	Good %	Average	Poor
1	Introduce our self to community	1 16.66%	4 66.66%	1 16.66%	0	0
2	Arouse interest in beginning by questioning	1 16.66%	3 50%	2 33.33%	0	0
3	Communication skill with the audience	1 16.66%	3 50%	2 33.33%	0	0
4	Way of delivering health message	1 16.66%	4 66.66%	1 16.66%	0	0
5	Confidence	1 16.66%	4 66.66%	1 16.66%	0	0
6	Speech	1 16.66%	3 50%	2 33.33%	0	0
7	Maintain cultural behaviour	0 0	4 66.66%	2 33.33%	0	0
8	Language is understandable	0 0	4 66.66%	2 33.33%	0	0
9	Overall completion and quality of community activity	1 16.66%	4 66.66%	1 16.66%	0	0

**Table 6. Observation of Perception of Students and Assessment Check List**

Student No.	Perception of Students		Assessment Check List	
	Obtained Score	%	Obtained Score	%
S1	21	70	36	80
S2	23	76.	40	88.
S3	22	73.	36	80
S4	20	66.	36	80
S5	22	73	27	60
S6	24	80	35	77.
Average	22	73	35	77.

which they developed leadership qualities in order to become enlightened change agents [14].

Whether student attained desired level of knowledge or not was observed by Pre and Post-test score. Average Pretest score was 23.35% and in Post-test it was increased to 86.85% (Table 1). This indicates that the intervention was highly effective.

On qualitative analysis of the responses to the open-ended questions majority of the students seemed to have favorable attitude towards CBL. It will develop their social skills, personal growth and confidence, greater empathy for other, improved problem solving skills but with this they also face some challenges like lack of accommodation, bad road network and inadequate transport system to move within the community and more time consuming which if adequately addressed would provide a more enabling learning educational environment.

Assessments of student while implementing the module in community was done by checklist and it was observed that student get benefitted by acquiring different skill. Out of six one student was excellent in all skill and remaining five student was in very good range i.e. above 50% student having very good performance and remaining two have satisfactory performance. No student is having poor performance (Table 5, Table 6). As student get exposed to community only at once so 100% excellence is not found in the behavior of the student but after one visit, interaction with student was done and at that

time they become more confident to deliver the speech in community for second time.

Evidences about poisoning due to pesticides are reflected in a number of studies [15-22]. In present study PAM not only help in conducting systematic awareness but also resulted in significant changes in student such as enhancement of knowledge, increasing communication skill, leadership skill and boost their confidence by gaining the community experience. This module was appealing and effective tool for community and generating various positive attitudes towards learning this subject.

## 5. CONCLUSION

Study module was the relevance of the academic module to the real world which creates an interest among student for teaching to community and for learning themselves. Community-based teaching viewed positively by the student which was reflected by their active participation. It was an enjoyable and rewarding experience not only in terms of achieving cognitive skills but also in attaining number of affective outcomes including responsibility towards community, communication skills and leadership skill.

## CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

It is not applicable.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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