

MEDICAL EDUCATION

Impact of Continuing Education on Performance of Health Inspectors

By Abdulla Ahmed Ali * and Tolo Dudani **

ABSTRACT

During Oct. 1987 and Jan. 1988, the Public Health Program at the College of Health Sciences conducted a continuing education program in epidemiology and communicable diseases to 12 health inspectors. The knowledge, skills and behaviour of the participants were assessed and compared before and after C.E. by using statistical analysis of results. It was found that C.E. contributed to the growth and improvement of the knowledge whereas it did not significantly improve the performance.

REVIEW OF LITERATURE

Abbat and Mejia ¹ have defined continuing education (C.E.) as "all the experiences after initial training, that help health care personnel to maintain or learn competencies relevant to the provision of health care". Some what similar definition has been given by Ward² she stated "those processes facilitating the continuation of learning after undergraduate and graduate (vocational and speciality) education constitute continuing medical education". Continuing education is a life long activity. In the last decade C.E. has become one of the major concerns of health professionals in the world. Many countries have developed and implemented C.E. activities for

the following reasons: i) improving competence of health care personnel to provide quality health care to the people, ii) Motivating health care providers, and iii) validating prior learning ^{3, 4}. Some countries have taken C.E. very seriously, for example, in the U.S. mandatory C.E. was started in late seventies for many professions ³. However, the effectiveness of C.E. is still being debated. Some authors ^{3, 5, 6} reported gain in knowledge, skills and attitude after participation in C.E. programs. Kicklighter⁶ indicated that these gains are not sustained over time. Few other authors ^{7, 8, 9, 10} reported changes in practice after completion of C.E. Many other authors did not notice post C.E. improvement in performance. For example, of the 25 studies summarized by Bertram and Brooks-Bertram ¹¹, change in performance was reported in only 15 studies. Young ³, Oliver ¹² and Cox ¹³ reported increase in application of knowledge and skills at work only after repeated practice and reinforcement.

Methods used for evaluation of the impact of C.E. programs are very crucial. Bertram and Brooks ¹¹ reported that of 25 studies, only 2 studies involved a comparison group and statistical analysis whereas the others used self reported behaviours as evidence of change in practice.

* Lecturer
Public Health Program
College of Health Sciences
State of Bahrain

** Lecturer
Public Health Program
College of Health Sciences
State of Bahrain

The Public Health Program at the College of Health Sciences considered C.E. as a necessity for health professionals to keep abreast of scientific changes in the discipline and improve competence. The program in conjunction with the Public Health Directorate decided to regularly offer C.E. to mid level professionals working in the public health.

During Oct. 1987 to Jan. 1988, the program offered a C.E. course to inspectors working in communicable diseases section. During the planning stage, it was decided to carry out a study to determine whether or not the C.E. course has achieved its objectives. The aim of this study was to evaluate the impact of C.E. on the knowledge and performance of health inspectors. The evaluation study was based largely on whether or not a change in knowledge and performance of the inspectors has occurred.

METHODS

From October 15, 1987 to January 28, 1988, the Public Health Inspector Program in the College of Health Sciences (C.H.S.) offered a continuing education program for health inspectors working in the communicable diseases and Environmental Health Sections of the Public Health Directorate. The first step in planning the continuing education program needs assessment and this was achieved by gathering data by the following methods :

1. Preparing an observation checklist to determine skills required by public health inspectors to perform their work. Daily practices of the participants were observed and evaluated by three teachers.
2. Sitting and talking to the participants to find out their needs and to determine their deficiencies.
3. Going through their records and paper work to determine what and how they keep the data, and
4. Giving them a pre test to measure their knowledge before starting continuing education.

Having assessed the need, seven providers were selected. Three were from Public Health Directorate and four from the C.H.S. The providers held either Master degree, M.D or PhD and had previous teaching experience at the C.H.S. The providers decided to teach Biostatistics for 8 hours. Epidemiology for 10 hours, Communicable diseases

for 10 hours and Communication for 2 hours. The course was offered 2 hours a week for 15 weeks. The schedule was adjusted to facilitate attendance. Participants were provided with handouts at the beginning of each contact hour. Handouts gave details on objectives, learning activities, content and references. A wide range of teaching/learning methods were used to achieve the objectives. Methods included lectures, discussions, problem solving and practical exercises. 12 inspectors participated in the program. All of them were either Associate degree or Diploma holders and had worked for 3 to 18 years.

At the start of the course the participants were given a written test covering Biostatistics, Epidemiology and Communicable diseases. Performance of the inspectors, using a checklist prepared by daily observation of their tasks, was assessed in the field on a rating scale of 1 to 4, by three members; two from the C.H.S. and the third from the service. The scores granted by the three members were then averaged.

Cognitive gain and performance of the participants were assessed at the end of the course. The participants were given a post test covering Biostatistics, Epidemiology, Communicable diseases, and Communication. Type of questions used for testing were multiple choice and exercises and both pre and post test questions were comparable. The time duration for the test was 2 hours. Performance of each of the 4 inspectors who worked in the communicable diseases section was assessed by the same evaluators, using the same checklist and rating scale.

The inspectors did not have prior information that they were being evaluated.

The results of the evaluation were analyzed using paired t-test and P-values were computed.

RESULTS AND DISCUSSION

The study is based on comparing results of written tests and assessing performance both before and after the C.E. Course.

9 out of 12 inspectors completed the course; 3 dropped the course at the beginning and they all were from Environmental Health Section. The results of pre and post written test for the 9

TABLE 1
Average Pre and Post Test Scores of 9 Public Health Inspectors
Attended Continuing Education Course

Subject	Pre test Score	Post test Score	Percent Change	Paired t test	
				t	P
Biostatistics	24.11	71	46.89	5.47	<.001
Epidemiology	34.22	68	33.78	8.40	<.001
Communicable Diseases	52	63.77	11.77	1.41	.195
Combined	36.71	67.57	30.86	6.47	<.001

inspectors who completed the course are given in Table 1. Mean score improvement (post minus pre test) for Biostatistics, Epidemiology and Communicable diseases, and combined were 46.89, 33.78, 11.77 and 30.86 respectively. Improvement in scores (cognitive gain) was statistically significant for Biostatistics ($t = 5.47$, $P < 0.001$), Epidemiology ($t = 8.40$, $P < 0.001$), and combined ($t = 6.47$, $P < 0.001$). However, no significant difference in pre and post test in communicable diseases scores was seen ($t = 1.41$, $P = 0.195$).

This could be explained by the fact that average pre test score on communicable disease was high: 52, as compared to pre test score on Biostatistics: 24, Epidemiology: 34 and combined: 36. Mean score improvement for communication could not be calculated, as the participants were not given pre test.

Performance in the work setting, of 4 inspectors, working in Communicable Disease Section, was assessed both before and after the C.E. course. Before C.E., participants were found to perform poorly in identifying sources of diseases, analysing the data and taking appropriate control measure; however, after C.E., some improvement has occurred but it was not statistically significant.

The scores of before and after course on performance of eleven performance items are presented in

Table 2. Percentage improvement in performance scores ranged from - 3% on ability to collect relevant data to 22.25% on ability to detect unreported cases in the community, averaging 12.19%. There was no statistically significant difference in average pre and post course performance for all skills combined ($t = 1.73$, $P = 0.182$). Statistically separate analysis was also made for each of the first eight skills, table 2. After completing the course, gain in performance was significant for only 2 items: (i) ability to confirm diagnosis by cross checking symptoms and laboratory reports and epidemiological investigations ($t = 4.34$, $P = 0.023$), and (ii) ability to detect unreported cases in the community ($t = 3.73$, $P = 0.034$). For the rest of the skills, the change in performance scores was statistically not significant at 95% confidence limits.

Jackson and Patricia¹⁴ categorised insignificant change in performance into: i. Lack of knowledge and skills which can be corrected by education. ii. Lack of facilities such as equipment and supplies and, iii. Management problems, where the personnel have equipment and know what and how to do the task correctly but fail to perform correctly. The last two will not be corrected with education as a sole strategy.

We consider the lack of knowledge and skills, and management problems are the two categories involved in the present study, as we could not find any

TABLE 2
Average Pre and Post Course Performance of 4 Public Health Inspectors
Attended Continuing Education Course

Skill	Performance			Paired <i>t</i> test	
	Before Course	After Course	Percent Change	<i>t</i>	<i>P</i>
1. Ability to Communicate with patients & contacts.	58.25	74.5	16.25	2.21	.114
2. Confirms diagnosis	68.75	84.25	15.5	4.34	.023
3. Takes appropriate samples	62.75	79.75	17	.88	.445
4. Tries to identify sources of disease	46.25	65.75	19.5	2.36	.099
5. Tries to identify mode of transmission of disease	65.75	65.75	0	.00	1.00
6. Detects unreported cases in the community	57.75	80	22.25	3.73	.034
7. Ability to collect relevant data pertaining to the cases	78.25	75.25	- 3	.52	.638
8. Initiates appropriate control measures	45.5	55.5	10	2.28	.107
9. Ability to present data *	Could not be assessed				
10. Ability to analyse data *	Could not be assessed				
11. Ability to interpret Epidemiological and statistical data. *	Could not be assessed				
Combined	60.40	72.59	12.19	1.73	.182

* Seldom performed

lack of facilities and equipment. The reason for insignificant change in performance resulting from lack of gain in knowledge and skills given in other studies^{5, 6, 15} are: (i) Items are not emphasised during training. (ii) Items of performance are not likely to change rapidly as it takes time to learn.

Non-emphasis of performance item could not be the reason in our study as the continuing education course was designed after thorough need assessment and performance items were included as objectives of learning sessions.

Our findings are in agreement with Oliver¹², Jackson¹⁴ and Nabali¹⁵ that it takes considerably long period to learn many performance items and that educational experiences should be provided to give more time for practice and should be supported by reinforcement.

The important management reason given for insignificant change in performance of the participants is that participants do not use knowledge and skills learnt, in the day-to-day work, though knowledge and skills learnt may have been intrinsically rewarding to the participants². In our study, we found that higher type of epidemiological skills like:

- i. ability to present data in the form of tables and graphs.
- ii. ability to analyze data, viz central tendency, variability, rates.
- iii. ability to interpret data both epidemiological and statistical were not performed by the inspectors regularly, though they had learnt these skills as proven by participants scores on post-test. On enquiry, it was found that the inspectors were primarily concerned with investigation of individual cases and control, whereas tasks of presentation, analysis and interpretation were not done.

All participants gave favourable comments about the training on C.E. evaluation sheet. However, some complained about English Language as being a barrier whereas two others said that some of the information presented was a repeat of what they had during Associate Degree studies. All the partici-

pants expressed their willingness to participate in similar programs in the future.

CONCLUSION

There was statistically significant improvement in knowledge and two performance skills on completion of C.E. Course. However, the improvement on remaining performance skills was not statistically significant.

It is recommended that continuing education courses should be regularly offered to health personnel based on needs assessment. To effect change in performance of participants, they should be involved more in practicum and teaching/learning should be problem-centered.

REFERENCES

1. Abbat FR, Mejia A, eds. Continuing the education of health workers: A workshop manual. Geneva: WHO, 1988:9.
2. Ward J. Continuing medical education. The Med J of Aus 1988; 148:20-22.
3. Young LJ, Reynold W. Effectiveness of continuing education for health professionals: A literature review. J of Allied Health 1984; 13(2): 112-123.
4. Richards RK, Cohen RM. Why physicians attend traditional continuing medical education programs. J Med Educ 1980; 55 (6): 479-485.
5. Cox CL, Baker MG. The key to accountability in continuing education. J Con Educ Nurs 1988; 12 (1): 11-19.
6. Klicklighter JR. Continuing education for health care professionals: A state of the art review. J of Allied Health 1984; 13 (3): 69-180.
7. McClellan TE, Cox JL. Description and evaluation of dentist: Dental assistant team training in efficient dental practice management. J AM Dent Assoc 1968; 76 (3): 548-553.
8. Rubenstein E. Continuing medical education at Stanford: The back-to-medical school program. J Med Educ 1973; 48 (10): 911-918.
9. Deets C, Blume D. Evaluating the effectiveness of selected continuing education offerings. J Cont Educ Nurs 1977; 8: 63-71.
10. Chambers DW, Hamilton DL, McCormick LP, et al. An investigation of behaviour change in continuing dental education. J Dent Educ 1976; 40: 546-551.
11. Bertram DA, Brooks-Bertram PA. The evaluation of continuing medical education: A literature review. Health Education Monographs 1977; 5: 330-362.

12. Oliver SK. The effects of continuing education on the clinical behaviour of nurses. *J Cont Educ Nurs* 1984; 15 (4): 130-134.
13. Cox CL, Baker MG. Evaluation: The key to accountability in continuing education in nursing. *J Cont Educ Nurs* 1981; 12 (1): 11-19.
14. Jackson MM, Patricia L. Education of the adult learner: A practical approach for the infection control practitioner. *Am J of Infection Control* 1986; 14 (6): 257-271.
15. Nabali H, Bryan FL, Ibrahim J, Atrash H. Evaluation of training food service managers in Bahrain. *J Environ Health* 1986; 48 (6): 315-318.

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**For Registration and
further information contact:**

Dr. Abdul Rahim Jaafar
Chairman, Organising Committee,
Asst. Under-Secretary, Ministry of Health,
Emirates Medical Association,
P.O. Box 6600, Dubai, U.A.E. Tel : 377377,
Fax: 04-214298, Tlx: 45678 SEHTAD EM