

**Research Articles:**

## **Evaluating the Effectiveness Of A Continuing Medical Education Program On Urinary Stone**

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**Abstract**

**Purpose:** present study is to evaluate the effect of the urinary stone continuing medical education program on GPs' knowledge, attitude and performance in real situation.

**Material & Method:** 80 GPs, 19 female and 61 male, 43.2 +/-12.5 years old, 14.5 +/-11.9 years after graduation, who work in private practice in Tehran, participated in the study. They participated in two-day conference run by lectures and active discussion. The GPs' knowledge, attitude and behavior in managing three conditions: renal colic, ureteral stones, and passed stones were evaluated before and after program. The scores were, then, compared. GPs' performance evaluated using simulated patients one week before and two months after the program. Knowledge by 29 MCQ tests and attitude

by 10 items based on Likert's scale that was tested before and after the program.

**Findings:** The urinary stone CME program had positive effects on attitude and knowledge, so that its effects were still present two months after the program. The program had a significant influence on the GPs' behaviors in managing ureteral stones, but not in the other two conditions.

**Conclusion:** Providing appropriate content educational programs and encouraging the learners' participation in the programs will lead to an increase in knowledge and attitude. To make positive change in GPs' behaviors, other educational methods should be applied.

**Keywords:** Continuing Medical Education, Evaluation, Urinary Stones, Attitude, Knowledge, and performance.

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## Introduction

Continuing Education is an indispensable component of education in any health system (Karimzadeh Shiraze 1983). Continuing Education or long life learning is essential for maintaining professional skills, catching up with rapid scientific developments and for learning more about advances in diagnostic technologies, alterations in disease patterns, and new teaching/learning methods. A growth in the number of the elderly and increases in patient care expenses are also additional factors that have added to the importance of Continuing Education (Barbero 1995).

Considering the importance of Continuing Education after graduation, the Iranian parliament approved the act of Continuing Medical Education (CME) in the spring of 1995 for a five-year trial. The act covered all health professionals and allied sciences (Parliament documents 1991). The evaluation of the CME programs in the first five years trial period was done by questionnaires mailed to health professionals, designed by the headquarters of the CME office located in the Iranian Ministry of Health, and Medical Education.

Since in the second five years' trial period of CME, the emphasis is on improving the quality of CME programs, the headquarter of CME decided to change the evaluation process and put more emphasis on the evaluation of knowledge, attitude and performance among the GPs. It is believed that this kind of evaluation portrays a more appropriate picture of the success rate of the CME programs.

Several studies (Machensy et al 1996, Kadish et al 1995) and reviews (Davies et al 1992, 1995) have looked into the effectiveness of CME programs. Machensy et al used 25 pre-test and post-

test questions (true/false format) to evaluate the increase in the knowledge levels of 250 participants after a 12-session workshop. Their results indicated significant differences between the pre-test and post-test scores.

Kadish et al (1995), in the evaluation of a children trauma CME program in central America, used a pre-test and two post-tests one immediately after the program and another one in 9 months intervals. They found out there were significant differences between the scores before and after the program. There were no significant differences between the scores obtained in the two post-test exams but they also found improvement in the attitude of the participants so that after the program the participants became more confident in managing the children.

Davis et al (1992) in a review article of the effects of CME programs on GPs' practices and abilities and in general on health care delivery system, found positive improvements in the health system, although the improvements were not statistically significant in all medical aspects. Davis et al reviewed 50 research studies, of which 32 surveyed the physicians' behaviors, 7 on the effect of CME program on the patients, 11 on both methods of consulting and preventive medicine.

In the light of this, the purpose of the present study is not only to evaluate the success rate of one of the CME programs based on knowledge, attitude and performance but also to present a method of evaluation more appropriate for CME programs.

## Material and method

This is an educational trial study aimed at looking into the effect of CME program on



knowledge, attitude and performance of GPs.

The CME program on urinary stones was advertised in Iranian daily newspapers for the attention of GPs in private practice in Tehran province. 100 GPs were selected from those who responded. Those GPs whose data were incomplete at the end of the study were discarded in the analysis. Thus 80 GPs were left for analysis of which 19 were female and 61 male. They were in 43.2  $\pm$  12.5 age group and it was 14.5  $\pm$  11.9 years after their graduation.

Nephrologists and urologists prepared the content of the CME urinary stone program with the emphasis on 'must knows'.

The evaluation was conducted through three stages, test of knowledge, questionnaire concerning GPs' attitude, and simulated patients.

**Test of knowledge.** 29 MCQ tests were designed to check the GPs' knowledge regarding urinary stones. The tests evaluated not only the knowledge but also the GPs' judgement and decision making in various clinical situations concerning patients with urinary stones.

**Questionnaire concerning GPs' attitude.**

A 10-item questionnaire was designed and read to the GPs. The GPs were asked to choose one of the four choices: completely agree, agree, disagree and completely disagree which was based on Likert's Scale.

**Simulated patients.** Six medical students acting as patients evaluated GPs' practical skills in managing patients with urinary stones through observation. The students were trained for one week (15 hours) by the researcher and three specialists in nephrology and urology. The students

(simulated patients) divided in three clinical situations: renal colic, ureteral stone and passed stone. Pretending to having one of the three clinical situations, the students were referred to the GPs, participating in the program, through normal booking their, in clinic one week before the CME program and evaluated the way the GPs managed them as patients. The six students were divided into three groups of two students each simulating either of the following medical cases.

**The first group.** The patient is a young man with an anxious appearance suffering from pain on his right flank. The pain occasionally becomes severe and radiates to his genital organs. His pain is accompanied by nausea and vomiting. He is also constipated. He has no previous history of any kidney or any striking diseases. During the visiting, the patient complains of the frequency, dysuria without fever.

**The second group.** The patient is a young man with a tolerable pain, whose RBC is 10-15 times his WBC as detected in the urinary test. His CBC is normal. The KUB shows the 5-6mm stone in the ureter. A mild hydronephroses without stone has been noted in the sonography report.

**The third group.** The patient is a young man with passed stone which was found to be oxalate calcium.

There were three lists for the evaluation of the way GPs managed patients with urinary stones. Thus, in order to fill the evaluation lists more precisely, the student, simulating as another medical student accompanied one of the above cases. The three evaluation lists were as follow:

**The first evaluation list.** The first evaluation list included the way the GP



managed the patient with colic pain. The GP's behavior included taking history, physical examination, diagnosis and treatment and recommendation.

**The second evaluation list.** The second evaluation list included the way GP manages the patient with ureteral stone. The GP's management included accurate diagnosis, treatment (drug therapy and non-drug therapy) and subsequent steps (subsequent visits, referrals, etc).

**The third evaluation list.** This list contained preventive advice for the patient who has passed stone. Three stages were followed in the present study:

**Pre-test.** The knowledge and attitude of the GPs were tested before the CME program. The GPs were asked to choose a code (either digits or letters) and write it on the answer sheet instead of writing their names. The way the GPs managed the patients with ureteral stones were also evaluated the simulated patients. (this was one week before the program )

**The CME program** The 100 participants were divided into two equal groups and each group was trained for 10 hours of which four hours were for lectures on such topics as epidemiology, etiology and the symptoms of urinary stones, physical examination, diagnosis, treatment (conservative, surgery, lithotripsy), prevention and evaluation. Three lectures in every one-hour was followed by an hour of group discussion among the participants. The whole program was conducted in two days for each group. Before the program, a summary of the content of the program was handed to the participants. Overhead projection was used as an educational aid.

**Post-test.** The change in the GPs' level of knowledge was tested in two stages: the first was immediately after the program and second, two months after the program using the same questions from the pre-test. The attitude questions were also used in the post-test two months after the program. The participants used the same codes they had used in the pre-test. The way the GPs managed the patients was also evaluated as a post-test two months after the program, using the same method with simulated patients. Since for each medical case there were two simulated patients, care was taken to send each simulated patient to the GP only once.

The pre-tests and post-tests of all the GPs were surveyed. The sum of the scores for each GP was 20 in either of the tests: pre-test or post-test. The GP with a score of 20 was considered to be 100% expert in the area and score 10 as 50% expert. McNemara, X2 and the sign test were used to analyze the data.

## Findings

Table 1 indicates that the change in knowledge was significant for all the GPs regardless of their grades in the pre-test. Even whose scores were above 50% in the pre-test had 38.5% increase in their post-test scores which was statistically significant. The comparison between the two post-test scores showed no significant differences.

Table 1. The GPs' knowledge test scores before and after the urinary stone CME program.

	More than 50%	Less than 50%
Pre test	42 (53.8%)	36 (46.2%)
Post-test immediately	72 (92.3%)	6(7.7%)
Post-test 12 months later	71 (91%)	7 (9%)
Results	P<0.001	



## An evaluation of a continuing medical education program

Table 2 indicates that the desirable attitude (correct answers to more than 50% of the questions) two months after the CME program had increased by 35.9%, which was statistically significant.

Table 2. The GPs' attitude test scores before and after the urinary stone CME program.

	More than 50%	Less than 50%
Pre test	43 (55.1%)	35 (44.9%)
Post-test 2 months later	71 (91%)	7 (9%)
Results	P<0.001	

There were 27 GPs in the first group (renal colic). They were between the ages 48.8+/-13. Table 3 indicates the impact of the CME program on the GPs' management of the renal colic, in that, the change was not significant (3.7% increase).

Table 3. The GPs' management test scores before and after the urinary stone CME program.

	Post-test (2 months later)		Pre test		Results
	> 50%	< 50%	> 50%	< 50%	
Colic pain	12 44.4%	15 55.6%	11 40.7%	16 59.3%	NS
Ureteral stone	20 76.9%	6 27.3%	14 46.2%	14 53.8%	<0.0 7
Passed stone	6 23.1%	20 76.9%	5 19.2%	21 80.8%	NS

As shown in Table 4 there have been certain increases in the test scores of the GPs in the post-test but there were no significant differences between the scores.

Table 4. The GPs' renal colic management test scores before and after the urinary stone CME workshop.

	Post-test (2 months later)		Pre test	
	> 50%	< 50%	> 50%	< 50%
History taking	16 59.3%	11 40.7%	17 62.9%	10 37%
Physical exam	12 44.4%	15 55.6%	15 55.6%	12 44.4%
Para-clinical	8 29.6%	19 70.4%	6 22.2%	21 77.7%
treatment	15 55.5%	12 44.4%	9 33.3%	18 66.6%

Further analysis of the results indicated that after the CME program, administration

of serum to renal colic patients was significantly reduced ( $p<0.001$ ). That was one of the main program objectives.

There were 29 GPs in the second group, visited by simulating patients with ureteral stones. They were between 40.9+/-12 age groups. It was 13.5+/-11.5 after their graduation. The GPs' capabilities in managing patients with ureteral stones improved from 46.2% to 76.9% which was statistically significant ( $p<0.01$ ).

The success rate of the urinary stone CME program in improving GPs' management of the disease was different in the diagnosis and treatment of the patients, so that, the increase in the scores regarding diagnosis was 27% ( $p<0.01$ ) and regarding treatment was 19.2%.

There were 26 GPs in the third group, which dealt with patients who had passed stone. They were between 41.5+/-11.7 age groups. It was 11.9+/-11.8 after their graduation. There were no significant differences between pre-test and post-test scores of the GPs whose test scores were more than 50% in the pre-test.

The duration of each visit in the renal colic group was 8.5+/-3.2min before the CME program and 6.6+/-2.8min after the program. The duration of the visits in ureteral stone group before and after the program were 11.4+/-4.6min and 10.2+/-4.4min and in the passed stone group were 7.7+/-3.3min and 7.2+/-2.6min respectively.

## Discussion and Conclusion

The results of the study indicate that the urinary stone CME program has been successful in increasing GPs' knowledge, changing attitude and improving certain aspects of disease management skills. The present study revealed that the GPs' skills in managing patients with ureteral stones



had been significantly improved. However, there were statistically no significant differences in managing patients with passed stones or renal colic pain.

However it should be pointed out that the increase in the level of knowledge does not necessarily mean that there is an improvement in performance. The results of the study (Purkis 1982) indicated that although the participants could appropriately answer all the questions, in managing the patients in authentic situations they could not make the right decisions. Using true/false questions may not be the appropriate method for measuring knowledge level.

Davis et al (1995) believe that lecture based CME programs will not lead to a change in performance. They suggest, instead, that such methods as reminders, opinion leader, outreach visit, patient mediated interventions are more successful in changing performance.

The results of the present study also support Kadish et al's study that after two months of the program there were no reduction in the level of knowledge but the attitude questionnaire showed improvement after two months. The CME program in Kadish et al's study was conducted based on group discussion and simulated patients, while in the present study, the program was conducted based on both lecture and group discussion. This might account for the marked change in GPs' behaviors.

Davis et al studies (1992, 1995) indicate the positive effects of CME programs on the preventive medicine, but in the present study, there were no improvement in preventive medicine. It is recommended that CME programs should be oriented toward patient mediated intervention so

that the positive effect of the programs on the physicians' behavior can be assured.

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