

Medical school graduates' self-evaluations of expected learning outcomes

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Abstract

Background and Purpose: Determined outcomes in education are based on the ultimate expectations from the medical graduates.

Methods: One hundred and two medical school graduates of the last 4 years of universities located in a city were asked in 2015 to self-evaluate themselves according to 42 expected skill outcomes. These 42 procedures were approved in 2007, by expert panels of Iranian Ministry of Health and Medical Education.

Results: Mean score of 42 procedures according to self-evaluation in overall respondents (n=102) was 11.5±2.1. Just in 31% (13 out of 42 procedures), the scores were in the acceptable range of above 15.

Conclusions: Graduates evaluate themselves weak in 69% (29 out of 42 procedures). If their self-evaluation is real, clarifying the causes might be a key to educational improvement.

Keywords: MEDICAL EDUCATION, OUTCOME- BASED EDUCATION, PROCEDURE LEARNING

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Introduction

There is a famous story regarding a young boy and his dog Fido. The boy says “I taught my dog to whisper”, when his dog did not obey whispering order, he explained “I taught my dog, and I did not say he learned!”. Most of the teachers focus more on their teachings, instead of the student’s learning. Emphasis of outcome-based education is on learning. These learning outcomes are more than knowledge, describing practical ability. Outcome-based educations define expected

abilities of the learners. So, education should be responsive to goal attainment (1). Medical schools around the world are increasingly focused on outcome-based education (2-4). Conventional medical education models determine necessary knowledge for medicine, teach that knowledge, and test it, hoping that this knowledge guide learners to be ideal physicians. Outcome-based model moves from the end to the beginning. Beginning point is ideal physician. Curriculum planners describe successful graduates followed by the arrangements to make sure of outcome achievement. Learning situations are then prepared to make students able to achieve these outcomes. For instance, doing medical procedures is shown by recording blood pressure, urine analysis and chest radiography explication (1). “If goal attainment is not defined by criteria, no one could confirm goal

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attainment". Competency- based evaluation is in close connection to outcome-based education. Teaching, learning and evaluation are integrated in outcome- based education (5). Besides progressing understanding of outcome-based education in the world, there are determined package of outcomes for medical graduates in Iran, as well. Looking at necessary outcomes for medical graduates in Iran, one can see 42 procedures that are considered essential for each medical graduates (6). The aim of the present study was to define learning of these 42 procedures in medical graduates based on their self-evaluation.

Methods

Procedures and skill domains: The list of approved essential procedural skills from medical graduates defined exit outcomes were reviewed in detail. In this study 42 procedures and skills were selected in a check list. These 42 procedures and skills were as follows: suturing-dressing, dislocation-fracture, fixation, intoxication, convulsion, frost bite and heat exhaustion, sinking, burning, adult resuscitation, newborn resuscitation, venous- arterial sampling and venous injection, intra-muscular, intra dermal and subcutaneous injection, intraosteal injection, venous puncture, microscopic urinary analysis review, urine culture, naso-gastric tube application and gastric lavage, skin abscess drainage, pap smear, anterior nasal packing, vaginal delivery, circumcision, urinary catheter placement, national vaccination program, simple casting, electrocardiography, cerebro-spinal fluid aspiration, ascitis fluid aspiration, pleural fluid aspiration, staining and microscopic exam of different body fluids, microscopic exam of stool smear, Acid-fast staining exam, Micro tube measurement of hematocrit, Intra ocular pressure measurement, venous cut-down, tension pneumothorax management, microscopic exam of peripheral blood smear (malaria), arterial blood gas sampling, arterial blood gas explanation, PPD test, PPD test

result interpretation, a potassium hydroxide (KOH) skin test and research.

Participants: One hundred and two medical graduates (general practitioners) of 4 medical universities located in a big city in Iran who were available, were selected to be asked on the level of their ability to do these procedures and apply the required skill. All medical graduates with a valid phone number who responded included in the study. These general practitioners had been graduated within 4 last years. All of graduates were called by phone and were asked about their willingness to answer these questions and the time they preferred for telephone interview to answer 42 questions, that takes about 30-40 minutes. For each question, the respondents was asked to self-evaluate his/her ability (knowledge-skill) in that procedure in a scale of 1-20. Scale was categorized as follows: Acceptable (15-20), low score (10-15), very low score (5-10) and poor score (below 5). SPSS software version 17 was used to analyze data. Mean (standard Deviation) and Median (range) were used to describe the results.

Oral consent was obtained from the volunteers and they were assured of confidentiality and anonymity of data collected, also details and purpose of the study were disclosed.

Results

A total of 102 medical graduates participated in this survey. The mean score for 42 procedures based on self-evaluation (n=102) was 11.5 ± 2.1 . The calculated mean for each procedure is presented in Table 1. Categorization of procedures is presented in table 2. As indicated in table 2, just in 31% (13 out of 42) of procedures, the score was acceptable and in 69% (29 out of 42) it was below 15.

Table 3 shows the odd's ratio of wrong answer in occupational toxicology chapters in two groups.

Table 1. Mean and Median of each procedure marks (self-evaluation).

Row	Procedure	Mean (\pm SD)	Median (range)
1	Primary aids: suturing-dressing	17.5 \pm 2.4	8 (0-20)
2	Primary aids: dislocation, fracture, fixation	15.8 \pm 4.1	17 (0-20)
3	Primary aids: Toxication	12.9 \pm 5.5	14 (0-20)
4	Primary aids: convulsion	14.1 \pm 4.3	15 (0-20)
5	Primary aids: frostbite-heat exhaustion	10.7 \pm 6.8	13.5 (0-20)
6	Primary aids: sinking	9.9 \pm 6.3	13.5 (0-20)
7	Primary aids: burning	13.4 \pm 5	15 (0-20)
8	Adult resuscitation	14.1 \pm 3.7	15 (0-20)
9	Newborn resuscitation	9.8 \pm 6.4	12 (0-20)
10	Venous- arterial sampling and venous injection	16.3 \pm 3	17 (0-20)
11	Intra-muscular, intra dermal and subcutaneous injection	17.4 \pm 2.1	18 (0-20)
12	Intraosteal injection	0.8 \pm 3.2	0 (0-19)
13	Venous puncture	15.4 \pm 4.7	17 (0-20)
14	Microscopic urinary analysis review	9.8 \pm 7.1	12 (0-20)
15	Urine culture	9.9 \pm 6.9	12 (0-20)
16	Naso-gastric tube placement and gastric washing	16.8 \pm 2.9	17 (0-20)
17	Skin abscess drainage	13.3 \pm 6	15 (0-20)
18	Pap smear	15.7 \pm 4.5	16 (0-20)
19	Anterior nasal packing	13.6 \pm 6	16 (0-20)
20	Vaginal delivery	13.7 \pm 4.9	15 (0-20)
21	Circumcision	1.5 \pm 4.4	0 (0-18)
22	Urinary catheter placement	17.2 \pm 3.5	18 (0-20)
23	Vaccination based on national program	14.6 \pm 4.8	15 (0-20)
24	Simple casting	15.4 \pm 4.2	16(0-20)
25	Electro cardiography	16.6 \pm 3.5	17 (0-20)
26	Cerebro-spinal fluid aspiration	9.4 \pm 7.2	10.5 (0-20)
27	Ascitis fluid aspiration	10.5 \pm 6.5	12 (0-20)
28	Pleural fluid aspiration	4.5 \pm 6.3	0 (0-20)
29	Staining and microscopic exam of different body fluids	9 \pm 6.5	10 (0-20)
30	Microscopic exam of stool smear	7.6 \pm 6.1	10 (0-20)
31	Acid-fast staining exam	7.8 \pm 6.2	10 (0-20)
32	Micro tube measurement of hematocrit	5.2 \pm 6.2	0 (0-18)
33	Intra ocular pressure measurement	6.3 \pm 5.9	0 (0-18)
34	Venous cut-down	1.4 \pm 4.2	0 (0-19)
35	Tension pneumothorax management	8.8 \pm 5.9	10 (0-19)
36	Microscopic exam of peripheral blood smear (malaria)	10.1 \pm 6.6	12 (0-20)
37	Arterial blood gas sample	16.7 \pm 2.7	17 (0-20)
38	Arterial blood gas results interpretation	15.6 \pm 4.2	17 (0-20)
39	PPD test	14.7 \pm 5.4	16 (0-20)
40	PPD test explanation	15.4 \pm 4.7	16.5 (0-20)
41	KOH skin test	1.6 \pm 4.7	0 (0-20)
42	Research	13.3 \pm 6.2	15 (0-20)
Total		11.5 \pm 2.1	11.6 (4.6-16.7)

Discussion

Procedural skills is an important part of medical student learning in procedures leading to their self-esteem in practice. In the

present study Mean score of total 42 procedures was 11.5 \pm 2.1, in low score category. In 29 out of 42 procedures (69%), self-evaluation score of the respondent was less than 15 (Table 2). This finding indicates

Table 2. Categorization of procedure according to mean score

Mean category	Number (%)
Acceptable (>15)	13 (31)
Low score (10-15)	13 (31)
Very low score (5-9.9)	11 (26)
Poor score (below 5)	5 (12)
Total	42 (100)

that procedures are not learned well based on self-evaluation. Outcome-based education and evaluations are integrated into each other (7). Evaluation methods should accommodate learning methods and students must be exposed to learning experience appropriate to future evaluation and practice (8). Studies confirm that educational outcomes, if are measurable might result in educational change regarding student learning and faculty teaching methods (9). Change based on learning principles results in medical student learning improvement. Faculty members could guide and support learners in structured, effective learning resulting in competence (10).

Common mode of all outcome-based education programs is what students know and do. So, arrangement of a proper evaluation system is the main part of the outcome-based education (11).

There are different methods to determine necessary outcomes including expert opinion, medical failure studies, critical incident review, task analysis of employees, mortality and morbidity statistics, top performer characteristics, review of existing educational programs and graduate opinions, all might help to arrange outcomes (12-16). If outcomes are satisfactory, teaching experience is appropriate and evaluation criteria are well aligned, graduates would be competent in the outcomes. Each of these points could explain the low scores of 42 studied procedures. In a review of the Iranian educational problems the essential weak points of medical education system were

identified. The results might suggest the probability of the following problems: the insufficient competency of faculty members, unplanned education, suboptimal exposure to common cases, ineffective attendance of interns in educational hospitals, no effective educational collaboration, some non-observance of moral codes in teacher-student relationship, difficulties in evidence based medicine training, deprivation of documentation in clinical education and improper evaluation methods which have also been observed in previous studies (17). More studies are needed to clarify the main problems leading to low scores of 42 studied procedures.

The main limitation of the present study is sampling of graduates of universities just located in a big city of Iran, so the results are not generalizable to all medical graduates in Iran. National classified sampling including most or all universities especially located in smaller towns, would improve generalizability of the study. Another limitation might be the method of competency assessment (self-evaluation). Respondents might achieve different score if they participated in an objective examination.

Conclusion

The self-evaluation scores in 29 out of 42 procedures are below the acceptable range. We recommend further studies to find the relevant causes for the poor self-evaluation scores.

Conflict of Interest

The author declares no conflict of interest.

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