Do Interns Achieve Learning Outcomes up to Faculty Members' Expectations?

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Abstract

Background and Purpose: *In an era of increasing professional accountability, there is a need for both medical educators and licensing bodies to identify the exit competencies expected from medical graduates. Pediatrics department of Isfahan University of medical sciences has defined learning outcomes that should be achieved in pediatric ambulatory setting and both learners and teachers were informed about these outcomes. The aim of this study is to compare faculties' expectation and interns' self-assessment about their achievement of learning outcomes at pediatric out-patient clinics.*

Methods: *In this cross-sectional study conducted in October and November 2005 a list of 63 learning outcomes was prepared. In the first phase, all faculty members were asked to specify desired level of achievement on 0-3 analogue scale for each outcome. In second phase, interns were acquired to self evaluate their level of achievement in these competencies based on the above scale.*

Results: *In this study 53 interns and 6 faculty members participated. Interns were expected to be fully competent with respect to eleven learning outcomes. There was a significant difference between faculties' expectations and interns' self assessment in 6 of full competency requiring outcomes and in 13 of high competency requiring outcomes.*

Conclusion: *Interns' achievement seems unsatisfactory regarding outcomes requiring full and high competency achievement and pediatrics department can revised its curriculum based on the results of this study and improve teaching and learning in the outpatient services.*

Key words: *Education, Ambulatory Patient Care, Learning Objective, Pediatrics*

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Introduction

Medical schools are concerned with training capable physicians to meet the needs of the society. In the 21st century, the challenge of the pediatric discipline is to promote health and development of children in a way that will enable them to maximize their biological and social potentials(1). The society expectations have changed over time and it recognizes the need for a broader view and wants doctors who can and will attend equally well to all aspects of health care (2) and teaching is effective only if it succeeds in changing behavior and supporting positive health outcomes (3).

In an era of increasing professional accountability, there is a need for both medical

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educators and licensing bodies to identify the exit competencies expected from medical graduates. Once these competencies are identified, educators must translate them into meaningful learning objectives (4).

Medical curricula are generally organized based on three major pillars: objectives, learning experiences and evaluation. It is assumed that all three parts exert an influence on the process of learning. All structured educational activities should, ideally, follow a single curriculum that guides student learning. This curriculum is best reflected by course objectives and the examination blueprint, linked to congruent learning experiences and evaluation as depicted by the 'cybernetic model'(5).

Conveying what the learner will understand or do after the learning experience is the purpose of a useful objective. Using a structured approach to generate learning objectives will support optimal learning and performance. Creating learning objectives provides a clear plan on what to teach and how to evaluate outcomes (3).

Predetermined instructional objectives developed by educators are integral to the traditional instructional model and form the linkage between instructional design and post instruction evaluation. The traditional model does not consider unanticipated learning outcomes(6)

The use of learning objectives has recently found extensive application in the evolution of medical schools' curricula (7)

The traditional undergraduate medical clerkship has several limitations, including inconsistency of clinical exposure and methods of examination. As a result, the clerkship experience does not ensure exposure to all core materials in a given specialty rotations.(8)

In pediatric rotation, there are 2 major clinical settings for clerkship students: hospital wards and outpatient clinics. Learning outcomes were defined by the pediatric department and both learners and teachers were informed about these outcomes. Ensuring achievement of learning outcomes by interns in outpatient clinics is one of the main concerns of pediatric department.

The objective of this study is to compare faculties' expectation of and interns' opinion about interns' achievement of learning outcomes at pediatric out-patient clinics.

Methods and Materials

In this cross-sectional study conducted in October and November 2005, a list of 63 learning outcomes was prepared and a questionnaire was developed for the survey. The study carried out in two phases using the same list of learning outcomes in each phase. Validity of the questionnaire was determined by two experts and reliability was evaluated in a pilot study.

In the first phase, all faculty members who were working in the university affiliated outpatients clinics were asked to specify the desirable level of competency achievements by interns based on an analogue scale of 0-3 where 0 means no competency and 3 means full competency. Level of achievements of these learning outcomes would be then categorized into four groups based on the mean of the score given by faculty members: 3=full competency, $2.5\leq$ high competency <3, $2\leq$ moderate competency <2.5, $1\leq$low competency <2, minimal competency <1.

In second phase, interns were asked to express their opinion about their own competency achieved with respect to each learning outcome by use of the aforementioned scale (used by faculties) and the learning experience ("self-study", "instruction by a resident or a faculty member", "facing the real situation in out-patient setting").

All data were entered into a computerized data processor and analyzed by SPSS software version 11.5. Mann-Whitney test was used. A p-value of less than 0.01 was considered significant.

Results

The participants were 53 interns and 6 faculty members. There was a consensus between faculty members about 11 learning outcomes that require full competency (a mean of 3) at the end of rotation (Table1).

Table. 1 The difference of interns' competency by interns' self assessment and faculties' expectations on the outcomes which require full competency

No	Learning outcomes	Mean difference of interns' competency by interns' self assessment and by faculties' expectations		% of student not exposed
		Mean±std	P value	
1	Treatment of Common cold	2.47+0.74	0.152	6.1
2	Explaining treatment of pharyngitis	2.53+0.74	0.208	10.2
3	Diagnosis if otitis media and its complications	1.73+1.02	0.003	20.4
4	Treatment of otitis media	2.06+0.81	0.009	14.6
5	Diagnosis and differentiating varieties of diarrhea and dysentery	1.9+0.77	0.001	14.6
6	Prescribing ORS correctly	2.52+0.71	0.203	8.3
7	Differentiating varieties of fever needs urgent diagnosis	1.44+0.87	0.000	21.7
8	Prescribing anti-pyretic drug correctly	2.38+0.84	0.132	10.6
9	Interpret U/A	2.25+0.86	0.106	14.6
10	Treatment of urinary tract infections	1.96+0.75	0.002	13
11	Diagnosis & Treatment of iron deficiency anemia	2.02+0.76	0.002	18.8

More than half of the interns (%58.25±8.18) self-studied for the outcomes which require full competency at the end of rotation; 65 %(12) and 13.9%(5) of the students received instruction for these outcomes by attending physicians and residents, respectively.

Achievements by interns of these outcomes were far lower than attending physicians' expectation and about 17% of interns did not face the real intended situation at all.

Interns were expected to be highly competent in twenty four learning outcomes. Results of interns' self assessment on these outcomes were compared with the faculty members' expectation in Table 2.

Less than half of interns (45.3±14.7) self-studied, while 45.2±19.3 and 7.1±5.5 of interns received instructions from faculty members and residents, respectively.

Faculty members expected moderate, low and minimal competency regarding 20, 7 and 1 learning outcomes, respectively (Table 3).

Discussion

The use of learning objectives may have significant advantages for both students and teachers. Objectives can serve as educational guideline that help students organize information, establish priorities and assess progress(9) but in a study it was showed that in pediatric clerkships curricular objectives were seldom used to guide students' learning and in minority of programs students were provided with specific written learning objectives(10).

Of 11 outcomes that interns should achieve full competence in, there were significant differences between faculty members' expectation and

Table 2. The difference of interns' competency by interns' self assessment and faculties' expectations on the outcomes with high competency requirement

No	Learning Objectives	Faculties' expectations Mean(SD)	Interns self-assessment Mean(SD)	P value	% of interns not facing the learning experience
1	Prescribe common drugs with respect to age of child	2.83+0.41	1.47+0.77	0.000	16.3
2	With respect to infectious diarrhea prescribe appropriate antibiotics	2.83+0.41	1.69+0.87	0.003	14.6
3	suggest appropriate order in diarrhea	2.83+0.41	2.47+0.62	0.160	6.4
4	Educate patient on essentials required for constipation care	2.83+0.41	1.69+0.99	0.005	14.4
5	Treat vomiting	2.83+0.41	1.48+0.95	0.001	23.4
6	Treat impetigo	2.83+0.41	0.9+0.99	0.000	56.3
7	Treat febrile child with out any localizing signs	2.83+0.41	1.72+0.97	0.008	21.7
8	Treat acute sinusitis	2.8+0.45	2.06+0.97	0.91	14.9
9	Diagnose lymph node, lymphadenopathy and lymphadenitis	2.8+0.45	1.15+0.87	0.000	45.8
10	Differentiate primary and secondary enuresis	2.67+0.52	1.4+1.11	0.011	36.2
11	Manage vomiting correctly	2.67+0.52	1.69+0.85	0.012	10.9
12	Diagnose failure to thrive and describe common causes of growth disturbance	2.67+0.52	1.85+0.77	0.031	8.5
13	Diagnose impetigo	2.67+0.52	0.94+0.94	0.000	54.2
14	Evaluate enuresis by lab data appropriately	2.67+0.52	1.23+1.04	0.003	34.8
15	Differentiate causes of constipation	2.67+0.52	1.48+0.97	0.005	20.8
16	Treat enuresis correctly	2.58++0.66	1.08+0.99	0.002	36.2
17	Instruct parents for follow up of urinary tract infections	2.58+0.49	1.81+0.84	0.027	10.9
18	Diagnose complications of vaccination	2.5+0.84	1.38+0.99	0.015	31.9
19	Describe common causes of growth disturbance	2.5+0.84	1.45+0.95	0.021	19.6
20	Describe differential diagnosis of hypochromic microcitic anemia	2.5+0.55	1.98+0.86	0.243	22.9
21	Diagnose hyperbilirubinemia due to breast feeding	2.5+0.84	1.71+0.87	0.037	23.4
22	Diagnose common infantile anomalies	2.5+0.55	1.54+0.90	0.021	41.7
23	List indications for lymphadenopathy evaluation	2.5+0.84	0.77+0.79	0.000	54.2
24	Differentiate the common causes of exanthematous disease	2.5+0.55	1.17+0.93	0.002	46.8

Table 3. Learning outcomes in which interns should achieve moderate, low and minimal competency

Level of Competency expected	No	Description of Learning Objectives
Moderately competent	1	Name lab tests for diagnosis of diarrhea and interpret its results
	2	Differential diagnosis list generation by use of history taking and physical examination
	3	Name normal dermatologic finding in neonates
	4	List indications of admission in hyperbilirubinemia* (p= 0.001)
	5	Differentiate pathologic hyperbilirubinemia from other varieties of jaundice
	6	Able to answer parents' questions about contamination period of exanthematous disease
	7	Manage common headaches* (p= 0.001)
	8	Define normal growth criteria in different ages
	9	Distinguish abnormal growth of child
	10	Diagnose and treat hepatitis and varieties of it* (p=0.001)
	11	Distinguish growth pain * (p=0.000)
	12	Describe diagnostic values of ASO, ESR & CRP
	13	Diagnose and treat all kinds of neonatal conjunctivitis
	14	Treat bacterial lymphadenitis*(p=0.000)
	15	Name common complications of antibiotics
	16	Define the best time for anomaly correction and referral*(p=0.001)
	17	Name common causes of lymphadenopathy
	18	Prescribe appropriate lab tests for diagnosis causes ?of headache*(p=0.002)
	19	Interpret lab tests in cases of icterus infants
	20	Name causes of chronic abdominal pain
Low competency	1	Prescribe varieties of vaccines correctly
	2	Manage bruxrism appropriately* (p=0.000)
	3	Explain common complications of splenectomy
	4	Prescribe appropriate diagnostic laboratory tests in cases of abdominal pain
	5	Treat mycotic diseases of skin in children
	6	Diagnose non- purulent arthritis
	7	Recall the appropriate time for injection of pneumococcea vaccine in patient undergone splenectomy
Minimal competency	1	Define the conditions under which vaccines should be stored

** there is a significant difference between faculty members' expectation and interns' competency through self-assessment*

interns' self-assessment in 6. More than 10% of interns claimed that they did not have any practical experience needed for learning of such objectives. As this group of objectives is considered as "must knows", pediatric department should pay more attention to them.

Thirteen out of 24 objectives that require high competency, interns' self assessment was far from faculty members' expectations. As this group of objectives is important it is strongly recommended that measures be taken to help student improve their performance on these outcomes.

Regarding full competency and high competency requiring objectives, 58.25% and 45.3% of interns self-studied to achieve the require level of mastery, respectively. Although not enough it may show that interns found these objectives more important.

It is suggested that all disciplines develop their own learning objectives and use them to review and, if necessary, reform their curricula to ensure that their students have opportunities to achieve those objectives(2). For better judgment, it is recommended to consider learning objectives as a guideline for preparing objective exams blueprint(5).

This method can be used by other departments to find out the priorities of interns clinical education and evaluate the success of educational efforts. Its continuous use and critical evaluation of the results may be useful to improve the quality of teaching and learning and a clearly defined learning objective may help educators define an appropriate teaching method (9).

We relied on self-assessment by interns as a measure of their competence which has its limitations on interpreting the results because students may falsely over or underestimate their competencies. A review article indicated that self-assessment had limited validity as a measure of professional competence and for competence evaluation external assessment is suggested (11). As faculty members who specified "must knows" and "essential to know" in this study its generalizablity may be compromised. Further studies in other universities with a wider sample of interns and faculty members seem warranted.

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