



Evaluation by Assessment of Competencies in Pre-clerkship Medical Training

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Introduction

Student competencies in clinical assessment, diagnosis and treatment would be enhanced if the mindset of integrative thinking and self-directed learning was instilled in the future physician throughout the entirety of medical education even as early as the start of the pre-clerkship curriculum. In the first phase of a study being conducted at the Philadelphia College of Osteopathic Medicine, a series of online accessible, case based, self-directed tutorials were used to assess the percentage of students that self-selected the optional learning aids and identified themselves as self-directed learners. The study data indicated that about 20% of the medical student population was identified as self-directed learners.

The next phase of this study is to use learning within the context of core competencies from the very beginning of medical training as a strategy to guide students into the process of self-directed learning. This strategy is anticipated to facilitate a shift in student learning mode from one focused on absorption and regurgitation of content to a learning mode focused on relating educational content to clinical practice. In this phase student's attention was directed toward learning and understanding the core competencies prior to the start of their matriculation in medical school. A few weeks prior to matriculation students received a required assignment related to core competencies that was subsequently reviewed in small group sessions on the second day of formal classes. In the first week of class, clinical faculty facilitated small group sessions that provided students the opportunity to discuss how core competencies including medical knowledge, teamwork and professionalism relate to patient care.

To reinforce student understanding of core competencies, a broader approach to student evaluation was also initiated that was designed to maximize assessment of core competencies in the pre-clerkship curriculum. To extend the awareness of competencies beyond the competency discussions of the first week, a "Competency Assessment Form" (CAF) was developed for evaluation of student competencies in pre-clerkship courses. The CAF was modeled on the competency assessment form currently used in clinical clerkships. It was considered critical that core competencies defined for the pre-clerkship curriculum should be made directly relevant to the core competencies by which students will be assessed in clinical clerkships, in graduate medical education and in practice. Data is provided that indicates the success of pre-clerkship competency assessment to increase student awareness of the core competencies in the earliest part of medical training.

Abstract

To optimize integrated clinical/basic science learning students must understand how basic science information is used in the clinical workplace. It is hypothesized learning would be enhanced in the pre-clerkship curriculum if students could directly relate information they acquire to their future clerkship experiences.

Previous data has demonstrated that early in the curriculum when presented with integrated information in the form of independent self directed learning, students did not fully appreciate the relevance of comprehending basic science information within a clinical context. In this study it is proposed that at the beginning of medical training student learning within the context of core competencies might facilitate a shift in their learning mode from one focused solely on absorbing content to one focused on relating content to practice.

Just prior to matriculation students received a required assignment related to core competencies that was subsequently reviewed in small group sessions on the second day of class. The assignment was to view online exercises that provided a description of core competencies and clinical case history and physical examination videos. Students were asked to ascertain where core competencies were demonstrated in the case videos. The clinical faculty facilitated small group sessions provided students the opportunity to discuss how core competencies including medical knowledge, teamwork and professionalism relate to patient care. To reinforce student understanding of competencies, a broader approach to student evaluation designed to maximize assessment of core competencies in the pre-clerkship curriculum was also initiated. A "form" developed for pre-clerkship competency evaluation was used to assess student performance of particular class assignments. Students were provided ample guidance on the new assessment process.

Initial faculty feedback has indicated that performance in first term student case presentations was generally improved with students more fully engaged in discussing patient outcomes than on providing summative information.

Methods

A pre-matriculation assignment, small group discussion format and pre-clerkship "Competency Assessment Form" (CAF) were prepared for the medical students in the first year. Medical students in the second year or any previous years were not presented with the required first year pre-matriculation assignment and subsequent small group discussions. All phases of the study are covered under an approved IRB protocol.

Pre-matriculation Competency Assignment & In Class Discussions

A few weeks prior to matriculation first year students received a required assignment related to core competencies. The required assignment was reviewed in the first week of formal class during clinical faculty facilitated small group sessions. The small groups provided students the opportunity to discuss with faculty how core competencies including medical knowledge, teamwork and professionalism relate to patient care.

Pre-clerkship "Competency Assessment Form" (CAF)

The CAF developed for use in the pre-clerkship portion of the undergraduate medical school curriculum was adapted from the core competency assessment form currently used in third and fourth year clerkships. Students could be rated on a scale of 1-10 that covered standard through outstanding. Students were provided guidance on the new assessment process.

Case Presentations

As part of course instruction in the first year students are responsible to participate in student generated case presentations. Students are assigned to small groups (15-20 students). Within this small group students are further subdivided into teams of two or three. Each team is assigned a clinical case scenario. The team is responsible for assessing case symptoms as well as determining cause and possible treatments. Teams present their case findings to their respective small groups. The sessions are facilitated by faculty. Faculty complete CAFs for each student.

Surveys

An in class survey was administered to first year students (M1) at the beginning of the third term. At the same time surveys to assess student core competency knowledge from more advanced undergraduate classes (M2, M3, M4) as well as post-graduate classes (PGY) was administered via an online assessment tool. The percent of respondents varied for each class. The response for each class was; M 1 - 74%, M 2 - 21%, M 3 - 17%, M 4 - 21%, PGY - 29%. Survey questions were approved as part of an IRB protocol to study assessment of student knowledge regarding core competencies.

Results

Pre-clerkship Competency Form

The focus of the pre-clerkship "Competency Assessment Form" (CAF) developed for this study was to ensure that competencies being assessed in the pre-clerkship years are directly relevant to the clinical core competencies that will be assessed in the undergraduate clerkship and post-graduate curriculums as well as in practice. The CAF was used to evaluate student performance in multiple exercises in the first year. The predominant use of the form was to evaluate student performance in case assessment and diagnosis as well as in case presentations. The CAF includes specific areas to be evaluated that cover all seven AOA/ACOGME core competencies (Fig.1).

Initial feedback from faculty using the pre-clerkship CAF has indicated that as a result of core competency awareness performance in student case presentations of first year students was generally improved. Students were more fully engaged in discussing patient outcomes than on providing summative information. However, it was also noted that the CAF as it is currently implemented was cumbersome and time consuming to fill out and submit. The next phase of the study will involve streamlining the form and the evaluation submission process. Part of this will involve the move from a paper version to a digital version of the CAF.

Aspects of Competencies Evaluated on the Pre-clerkship "Competency Assessment Form" (CAF)

- Competency #1: Patient Care**
- Comprehension of compassionate care: Demonstrates understanding of multifaceted care that is effective for health promotion, wellness, disease and end of life support.
 - Assessment skill: Performs patient interview and exams; uses judgement; is respectful of patients.
- History taking, Physical examination
- Competency #2: Medical Knowledge**
- Demonstrates knowledge of biological structures and processes and how they relate to clinical scenarios.
 - Demonstrates consideration of the psychosocial aspects of medicine including but not limited to appropriate patient/physician interactions, diverse patient populations and patient access to healthcare.
 - Demonstrates ability to characterize a differential diagnosis.
- Competency #3: Practice Based Learning**
- Demonstrates critical assessment of published biomedical literature.
- Competency #4: Interpersonal and Communication Skills**
- Demonstrates ability to work cooperatively in a team environment.
 - Demonstrates ability to effectively communicate with others.
- Verbal exercise, Written exercise
- Competency #5: Professionalism**
- Demonstrates professional behavior in dress and deportment.
 - Demonstrates controlled behavior in response to feedback/constructive criticism.
 - Demonstrates commitment to growth in professional development.
- Competency #6: System Based Practice**
- Demonstrates an understanding of the healthcare system complexities from patient compliance to medical ethics and team based practices.
- Competency #7: Osteopathic Principles and Practice**
- Demonstrates the use of Osteopathic Principles in wellness, diagnosis and treatment.
 - Demonstrates an understanding of the relationship of structure and function in diagnosis.
 - Osteopathic structural exam.
 - Osteopathic manipulative technique.

Figure 1: The pre-clerkship "competency assessment form" (CAF) lists components of the AOA/ACOGME core competencies that are assessed in pre-clerkship courses. These components reflect areas that will be directly assessed in clerkships, post-graduate training and practice.

Conclusions

1) Instruction on core competencies provided in the earliest part of the pre-clerkship curriculum enhanced AOA/ACOGME core competencies awareness of first year medical students 50-75% over students who did not receive instruction on competencies early in training.

2) The use of a "competency assessment form" (CAF) for evaluation helped focus students toward discussion of comprehensive competency based patient care as compared to naïve case documentation in case conference presentations.

3) Survey comments from students in the clerkship and post-graduate training indicated the need to increase awareness of core competencies and the clinical competency evaluation process during the pre-clerkship years.

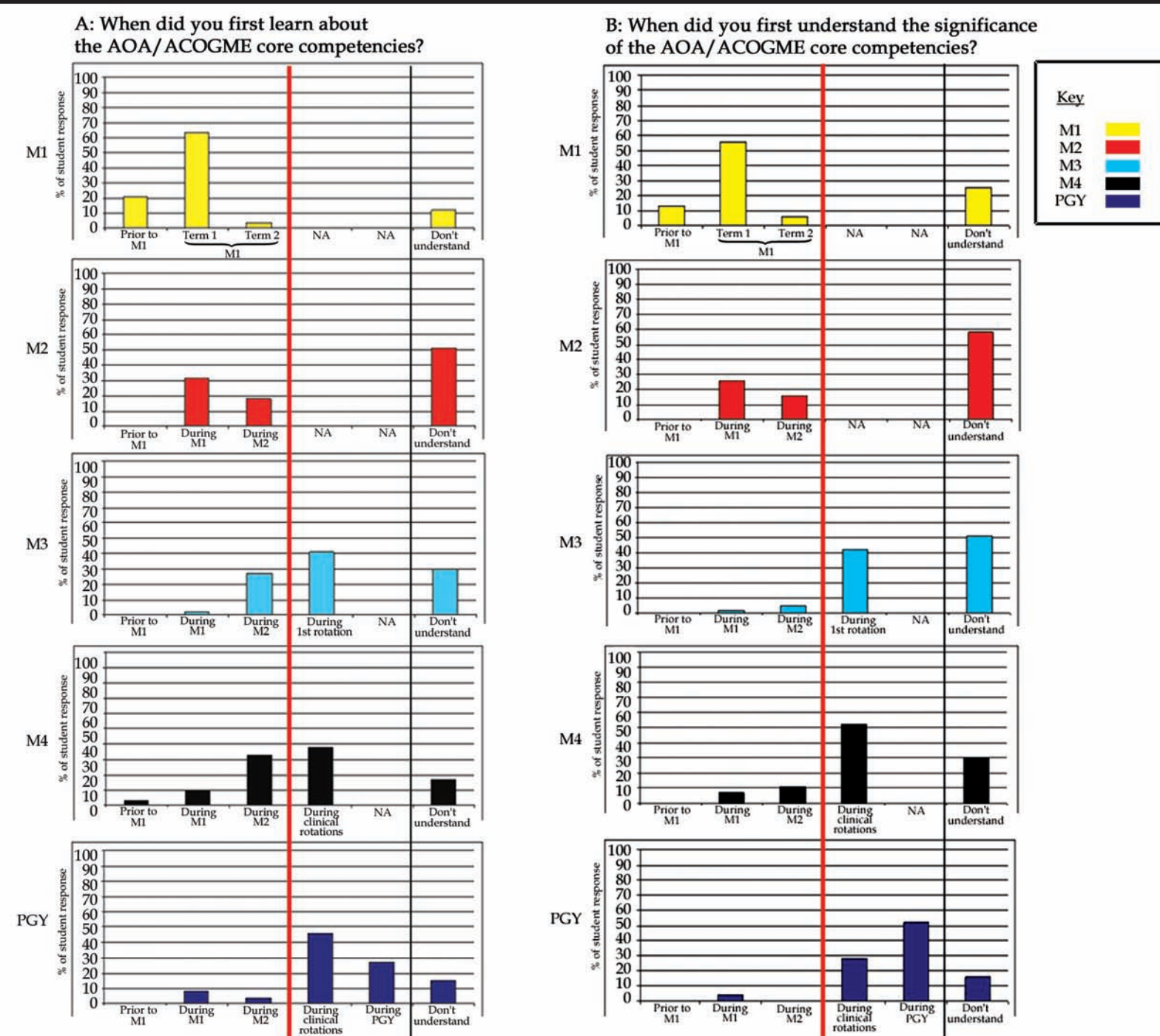


Figure 2: Student responses to two survey questions are represented as bar graphs. Survey responses to the question "When did you first learn about the AOA/ACOGME core competencies" are shown in 2A and responses to the question "When did you first understand the significance of the AOA/ACOGME core competencies" are shown in 2B. Responses for each year are displayed separately (M1, M2, M3, M4, PGY) and are color coded (figure key). The columns represent periods in year increments along the continuum of medical training (y axis). For medical training that any one class has not yet experienced an NA for not applicable appears. The last column in each graph [right of the black line] represents the

Survey results

A survey was designed to assess student exposure to and awareness of core competencies in both undergraduate and graduate years of the medical curriculum. The survey questions for each year varied in order to target appropriate information related to the respective periods in medical training. However, two questions were identical on every survey administered. The questions A) "When did you first learn about the AOA/ACOGME core competencies" and B) "When did you first understand the significance of the AOA/ACOGME core competencies" were designed to directly compare knowledge of first year medical students to students with more advanced training and to determine if recent changes in the first year of the pre-clerkship curriculum changed student perceptions about the competencies. Survey results for these two questions are shown in Fig. 2A&B.

Student responses in figure 2 are color coded for year [boxed key: upper right of figure]. Student responses to the question "When did you first learn about the AOA/ACOGME core competencies" are shown in Fig. 2A and responses to the question "When did you first understand the significance of the AOA/ACOGME core competencies" in Fig. 2B. The graphs for both questions demonstrate the direction of a clear trend for student awareness and understanding of the core competencies. The least awareness and understanding is seen in students who had instruction under the standard pre-clerkship curriculum while the most awareness and understanding is seen in students who have been exposed to recent curricular revisions.

M3 (A&B-M3), M4 (A&B-M4) and PGY (A&B-PGY) students indicated they had little awareness or understanding of competencies in the pre-clerkship years [graph bars left of the red line]. They further indicated acquisition of competency knowledge during clinical clerkships [graph bars right of the red line]. The number of students in M3, M4 and PGY that responded they still had a lack of knowledge about competencies [graph bars right of the black line] decreases with additional years of medical training (M4 and PGY) presumably as a result of experiential learning.

Fifty percent of students in M2 indicated that they acquired awareness and understanding of core competencies during the pre-clerkship years M2 (A&B-M2) [graph bars to the left of the red line]. This is at least a twenty percent increase over students who learned about competencies in the pre-clerkship years for M3, M4 and PGY1. For M2 students this increase likely reflects a more frequent reference to competencies in the pre-clerkship curriculum.

The greatest percent increase in awareness and understanding of core competencies was seen for students in M1. In contrast to students further along in the medical curriculum, 88% of students in M1 indicated they were aware of competencies and 75% understood the significance of competencies in the first year (A&B-M1) [graph bars to the left of the red line]. This is approximately 57% greater for awareness and 49% greater for understanding than that reported by students in M2 (A&B-M2). It is also approximately 76% greater for awareness and 68% greater for understanding significance than that reported by students in M3, M4 and PGY1. We suggest this increase in awareness and understanding of significance is a direct result of inclusion into the first year curriculum the pre-matriculation assignment, small group exercise and competency assessments.

A section for student comments was included on the survey. The common theme running through the comments from advanced undergraduate and post-graduate students indicated the need to learn about core competencies earlier in the curriculum. This need is documented to have been successfully met with the current emphasis on competencies early in the pre-clerkship curriculum. This study will continue analysis of this M1 cohort of students as they proceed through undergraduate training into PGY and compare them to the current cohort of M2 through PGY students to determine the extent of competency knowledge at the same level of training.