LETTERS

Determining Student-Faculty Ratios and Faculty Scholarship Levels/Rates

To the Editor. The recent article by Benavides et al[1] explored the correlation of faculty members' publication productivity to student-faculty ratios in colleges of pharmacy. These investigators also evaluated the influence of other factors, such as research funding, public vs. private university status, and supportive faculty members on scholarship. While these areas are important topics of investigation where additional insight would be welcomed, I would like to point out 2 potentially serious methodological errors in the study. These authors attempted to compile publication rates of colleges of pharmacy by searching PubMed. While there is insufficient detail in the article about how these searches were performed, it appears that the authors utilized the affiliation field of the MEDLINE database to search for individual schools and colleges. Unfortunately, the problem with this approach is that the MEDLINE database lists only the address of the corresponding author, not all the authors of the paper. So in a multi-university collaborative paper with, for example, 6 authors, only the corresponding author's address will appear in the MEDLINE record. This is in contrast to a database such as Science Citation Index (Web of Science online) which captures the address of every author on a particular paper. This error would result in a significantly underestimated publication count for some colleges.

The second related error is that many authors do not list "college of pharmacy" or "school or pharmacy" in their addresses. If this were part of the search strategy, it also would contribute to a significant underestimation of the true publication count. As an example, a 2007 calendar year PubMed search for just 3 individual basic science faculty members (KM Giacomini, A Sali, and BK Shoichet), all of whom are listed in the AACP Roster for the 2006-2007 academic year from the University of California at San Francisco (UCSF), yielded 43 non-overlapping publications. Since bibliometric author searches on any database can be contaminated by homologues[2,3] (ie, authors with the same name who are in different disciplines or institutions), I was able to validate 33 of these papers by searching the Web site of these faculty members at UCSF. The Benavides study lists only 24 total publications for UCSF for this timeframe. A careful inspection of the MEDLINE records for these 3 faculty members reveals that many list "Department of Biopharmaceutical Sciences" at UCSF in the affiliation field without mentioning school of pharmacy. As a result of these possible errors, this study may have seriously underestimated the publication output of some colleges and schools of pharmacy.

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REFERENCES

1. Benavides S, Garcia AS, Caballero J, Wolowich WR. The impact of student-faculty ratio on pharmacy faculty scholarship. *Am J Pharm Educ.* 2010;74(8):Article 138.
2. Smalheiser NR, Torvik VI. Author name disambiguation. In: Cronin B, ed. *Annual Review of Information Science and Technology*. Vol. 43. Malden, MA: John Wiley & Sons; 2009:287-313.
3. Soler JM. Separating the articles of authors with the same name. *Scientometrics.* 2007;72:281-90.

To the Editor. The article in the *Journal* by Benavides et al on student-faculty ratio and faculty scholarship is flawed in its methodology and conclusions.[1] The flaws stem from the injudicious measurement and characterization of publications and faculty numbers.

The authors searched *PubMed* for publications during 2007 by searching for the name of the institution as listed in the American Association of Colleges of Pharmacy (AACP) faculty roster.[2] *PubMed* contains this information in the Affiliation or address field (AD) that may include the institutional affiliation and address of the corresponding author of the article. The Corporate Author field (CN) identifies corporate or collective authorship.[3] Entries in these fields depend upon the author's designation and the respective journal's policy, if one exists, for completeness or consistency.[4-7] For example, authors may list a street address without the institution's name or use a variation or portion of the name of the institution. Multidisciplinary and multicenter research that included a pharmacy faculty member would not be identified unless the AD or CN fields included the name of the college of pharmacy and university.

We performed a search of PubMed for 2007 for the University of Tennessee College of Pharmacy, which has departments of clinical pharmacy and pharmaceutical sciences, and included variants such as UT, UTHSC, Tennessee, TN, Tenn, pharmacy, pharm, and pharmaceutical in the AD field. One hundred eleven papers were identified of which 39 were authored by full-time faculty members compared to the total of 17 given in Appendix 3 of the paper by Benavides et al. A search of CN field did not identify any additional articles. If part-time faculty members were included as listed in the AACP roster,[2] the publication number would have been higher, but all

may not have been identified using their methods. Since most of our part-time and affiliated faculty members are primarily employed by a non-university entity, the address would likely be the person's principal employer and not that of the university. In the case of the paper by Benavides et al, their own publication would not have been identified by their methods, because the name of their university is not stated in the address. Other reports examining publication rates of pharmacy faculty members used a more rigorous and comprehensive approach by searching by faculty members' names.[8-11]

Benavides et al state that they searched for ''review'' and ''research'' articles in PubMed, but they did not describe their definitions for these types of publications. ''Review'' is a legitimate publication type in PubMed indexing, but ''research'' is not a category.[12,13] Text-word searching of PubMed for either term would retrieve records that included the words ''review'' or ''research'' in any of the fields. This strategy could falsely include or exclude publications simply on the basis of finding the particular word in the publication's *PubMed* record which may or may not reflect the nature of the article.

The authors used the annual AACP faculty roster[2] to calculate the number of faculty per institution as (1) a total number of individuals listed minus nonacademic directors, (2) a value based on a formula by the American Association of University Professors (AAUP), and (3) the AAUP formula with an adaptation by the authors (AAUP Plus) to include emeritus faculty members and instructors. Both AAUP formulae count a part-time faculty member at one-third of the effort of full-time faculty members. In applying these calculations to the University of Tennessee College of Pharmacy based on the same AACP report,[2] the total faculty head count equaled 182 (versus 181 by Benavides et al), AAUP Plus was 114, and AAUP was 103 (values for the latter 2 estimates were not listed by Benavides et al). The total number of full-time faculty members (tenure-track and nontenure-track) at and above the rank of assistant professor was 70 in the AACP report, which does not distinguish between tenure-track and nontenure-track appointments, despite such differentiation by Benavides et al in their discussion. With inter-college variations in appointment policies of clinical and affiliated faculty members, in the use of clinical or adjunct modifiers in academic titles, and in the completeness of part-time faculty entries in the AACP roster, a comparison among colleges with these types of variation in faculty listings is meaningless. By including part-time faculty members whose publications may not have been identified in the literature search and emeritus faculty members who likely would not be publishing papers or receiving National Institutes of Health (NIH) funding, the faculty numbers of Benavides et al are mismatched to the measurements of scholarship. Others have estimated faculty numbers differently and described limitations of the AACP faculty roster.[14]

Due to shortcomings in achieving an accurate and robust search of the literature and utilizing a reasoned acquisition and application of datasets, the findings of Benavides et al should not be taken as a measure of reality and should not be considered in accreditation, workforce, or policy decisions.

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REFERENCES

1. Benavides S, Garcia AS, Caballera J, Wolowich WR. The impact of student-faculty ratio on pharmacy faculty scholarship. *Am J Pharm Educ.* 2010;74(8):Article 138.
2. Roster of Faculty and Professional Staff, 2006-2007. Alexandria, VA: American Association of Colleges of Pharmacy; 2006.
3. PubMed Help. National Center for Biotechnology Information, US National Library of Medicine, National Institutes of Health. http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=helppubmed&part=pubmedhelp#pubmedhelp.Accessed October 27, 2010.
4. Jonnalagadda SR, Topham P. NEMO: Extraction and normalization of organization names from PubMed affiliations. *J Biomed Discov Collab.* 2010;5:50-75.
5. Zbar A, Frank E. Significance of authorship position: an open-ended international assessment. *Am J Med Sci.* 2010: Published ahead of print. DOI 10.1097/MAJ.0b013e3181f683a1.
6. Wager E. Do medical journals provide clear and consistent guidelines on authorship? *Med Gen Med.* 2007;9(3):16.
7. Dickersin K, Scherer R, Suci ES, Gil-Montero M. Problems with indexing and citation of articles with group authorship. *JAMA.* 2002;287:2772-4.
8. Coleman CI, Schlesselmann L, White CM. Journal publications by pharmacy practice faculty evaluated by institution and region of the United States (2001-2003). *Pharm Pract.* 2007;5(4):151-6.
9. Thompson DF, Callen EC. Publication records among college of pharmacy deans (letter). *Ann Pharmacother.* 2008;42:142-3.
10. Thompson DF, Callen EC, Nahata MC. Publication metrics and record of pharmacy practice chairs. *Ann Pharmacother.* 2009;43:268-75.
11. Thompson DF, Segars LW. Publication rates in US schools and colleges of pharmacy, 1976-1992. *Pharmacother.* 1995;15(4):487-94.
12. PubMed Tutorial. US National Library of Medicine, National Institutes of Health. http://www.nlm.nih.gov/bsd/disted/pubmed.html. Accessed October 27, 2010.
13. NLM Training: PubMed. US National Library of Medicine, National Institutes of Health. http://www.nlm.nih.gov/pubs/manuals/pm_workbook.pdf. Accessed October 27, 2010.

14. Knapp DA, Knapp DE. Attributes of colleges and schools of pharmacy in the United States. *Am J Pharm Educ.* 2009;73(5):Article 96.

In Reply. The authors of the study on the impact of student-faculty ratio on faculty productivity realize that some limitations exist in the methods we used to determine the publication rate per school.[1] Dr. Thompson identifies 2 methodological errors in the study; however, both are related to the accuracy of determining publication rates. The publications per college or school of pharmacy were identified using the official name of the pharmacy institution in the MEDLINE database. In our study, we did not include Web of Science or International Pharmaceutical Abstracts (IPA). As mentioned in the article, the citations were searched by the official name of the pharmacy program as listed in the American College of Clinical Pharmacy (ACCP) Faculty Roster. The citation was counted for the institution of the corresponding author and was not counted for other authors from other institutions. Thus, any co-authorship from another institution was not counted toward that second institution's number of publications.

Although Dr. Thompson criticizes our approach, we defend our methodology as the other approaches suggested would have overestimated the publication rates. If credit were given to every institution for each author, the true number of publications published by pharmacy faculty members would be grossly inflated. This approach also assumes that each institution contributed an equal role (even if 1 out of 5 authors was from a different institution). Realistically, this is not the case; therefore, using this method would unfairly overestimate the scholastic contributions and significance of some institutions, while severely underestimating the value of others. Our results are conservative and systematic across all institutions. Credit for a publication was applied, as it should be, to the primary author's institution. Searching Web sites for each college of pharmacy, as Dr. Thompson suggests, would not be practical or methodologically sound. This is due to the heterogeneous nature of Web sites since some are not maintained regularly and are subject to entry errors.

Dr. Thompson correctly states that some authors did not include "college of pharmacy" in the corresponding title and ultimately their publication was not counted in our study. Faculty salary is typically paid for by the university, specifically, the respective college of pharmacy. Therefore, just as one states grant funding source (eg, NIH), the salary based institution (ie, college of pharmacy) also should be listed. In the example that Dr. Thompson provided, 34 publications (not 33 as he reported) were indeed published by those 3 UCSF faculty members. However, not including "college of pharmacy" in the corresponding address leaves it unclear which discipline at UCSF is publishing. Deans should remind their faculty members that it is imperative to include "school/college of pharmacy" for the respective institution to receive proper recognition for contributions to the literature of our profession.

In reply to the letter by Chyka and Earl, to the best of our knowledge, no data exist that can determine whether the number of students enrolled in a pharmacy program impacts the productivity of faculty members. The authors determined the number of faculty members as reported by the institutions and conservatively employed 2 measures of scholarship: NIH funding and publications by an institution. As indicated by Chyka and Earl, other studies have used a more rigorous and comprehensive approach to determine pharmacy faculty publication rates by searching individual faculty members' names. However, this is a "fallacy of relevance" as the objectives of the studies cited were not similar to ours and therefore their methodologies should not be used to critique our study. Had our intention been to replicate those studies, a similar approach would have been followed. On the contrary, the intent of our study was to determine a publication rate for the college, not to give a specific publication rate for individual faculty members. This issue has been further addressed in the above response to the letter to the editor by Thompson et al.

As stated in the methods of our paper,[1] the authors searched PubMed for all articles and the PubMed search engine automatically filters the "review" publications. In actuality, the "research" category overestimates the true number of "research" publications because it includes meta-analyses, clinical trials, case reports, and letters to the editor. The authors examined each citation individually to ensure a "review" article was in fact a "review" article.

A careful look at the University of Tennessee college of pharmacy demonstrates the inclusion of 181 faculty members (183 counted, excluding 2 with administrative titles), more than any other college of pharmacy in the United States. The inclusion of assistant professors whose salary and/or primary affiliation lies outside of the institution derisorily lowers this institution's publication rate while providing an illusory favorable student-faculty ratio in the eyes of the Academy. This is contrary to the vast majority of institutions who list only full-time faculty members who are paid for by the college of pharmacy. Using the suggested approach by Chyka and Earl of retrieving every publication by each faculty member listed in the American Association of Colleges of Pharmacy (AACP) roster would unjustly devalue the publication rate of the majority of institutions who listed only their funded faculty members while falsely elevating those specious colleges who included "everyone under the

sun." Additionally, many institutions do not list their part-time faculty members; therefore, not including these publications for our study was consistent throughout. Chyka and Earl also comment that we were able to distinguish between tenure-track and nontenure-track faculty members; we made no such differentiation. The discussion regarding tenure track only offered potential reasons as to why programs with instructors or clinical faculty members may have yielded a higher productivity.

Choosing to focus primarily on the specific student-faculty ratio of 1 institution hinders one's ability to acknowledge the overall conclusions drawn, which are based on the trends in the data. We realize the data have errors of both omission and commission, in both the dependent and independent variables. Statisticians have been working for years to solve the problem of finding a signal in a very noisy environment. Receiver operating characteristic (ROC) analysis is robust and not prone to outlier influence as are simple regression models. Moreover, we never intended this exploration of published data to be the final word on this subject. In fact, we encourage more research in this area. Despite conflicting viewpoints, public institutions appear better equipped for scholastic faculty productivity than private universities and the use of instructors, clinical, and non-tenure track faculty members can increase scholarship and research productivity.

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REFERENCES

1. Benavides S, Garcia AS, Caballero J, Wolowich WR. The impact of student faculty ratio on pharmacy faculty scholarship. *Am J Pharm Educ.* 2010;74(8):Article 138.

Lecture-Capture: The Early Qatar Experience

To the Editor. We read with great interest the article, ''Impact of Online Lecture-capture on Student Outcomes in a Therapeutics Course.''[1] We commend the authors for exploring this ancillary teaching technology and attempting to assess its impact on student outcomes, including course grades and class attendance.

We believe a number of their findings merit comment. While the authors demonstrated that final examination scores were higher in the study group, use of historic controls threatens the validity of this comparison, as confounding factors such as course modifications, differences among student cohorts in scholastic ability, and related factors were not formally considered. We were not surprised to learn that the investigators were unable to identify a relationship between accession volume and final course grades, because access is only 1 variable that will determine academic performance, and both academically strong and weak students would be expected to access lecture-capture materials.

In 2008, Qatar University College of Pharmacy implemented lecture-capture across all pharmacy courses to support the introduction of a new Canadian-accredited BSc(Pharm) program. We now employ Echo360 media platform (Echo360, Dulles, VA) to record audio, video, and computer/data camera images for all regularly scheduled classes, continuing education sessions, and faculty research/professional development seminars. Links to captured lectures are posted to the course Web site on Blackboard Academic Suite (Blackboard, Inc, Washington, DC), our online course management system, within 24 hours of the activity, and these links remain available for the duration of the semester. Upon completion of the course, the links (and all course materials) are archived and remain accessible to all pharmacy students (including students from other professional years) until graduation. Preliminary analysis of our course accessions reveals that students tend to revisit lectures within a few days of delivery to clarify concepts raised during the lecture, and prior to scheduled learning assessments. It is unfortunate that investigators chose to provide their lecture-capture materials for 72 hours only, and this could explain partially the apparent lack of influence of this learning/teaching method on final course grades found in this study. We believe providing students with the ability to return to lectures and courses previously delivered, as well as to look ahead at future courses, promotes curricular transparency, help students appreciate relationships among the courses they are taking and the overall study plan, and reinforces their understanding of how we strive to advance their knowledge, skills, and attitudes over the tenure of the 5-year degree program.

The authors rightly point out concerns associated between truancy and the availability of lecture recordings. At Qatar, class sizes are small ($\leq$ 25 students), and attendance is considered mandatory. Students receive a participation grade for each course, which is reduced for nonattendance. Despite the availability of lecture-capture postings over the past 2 years, absenteeism in our college is low and has not been influenced by the implementation of lecture capture. Our lecture-capture materials, available for review in perpetuity, are considered a resource

to augment the classroom experience and have additional utility in our English-language program, as students' first language is Arabic. We also were surprised that the authors report that most of their students declared watching entire 2-hour lectures, a pattern of usage not demonstrated by our students. Instead, our students tend to select the specific content within each lecture for review purposes. We would be interested to learn whether these full-lecture accessions were attributed to nonattendance of the specific classes.

While not discussed by the investigators, lecture-capture has benefits beyond that of being a student-learning augmentation tool. At Qatar, all course materials, including the associated lecture-capture links, are made accessible to all full-time faculty members via our course management software, which facilitates course and lecture planning, improves content sequencing, and reduces redundant and/or possibly contradictory lecture content delivery. Additionally, lecture-capture files provide an opportunity for professional development for faculty members by permitting "virtual" attendance of fellow faculty lectures, research seminars, and continuing education events.

Lecture-capture also has been incorporated into our peer teaching assessment and academic promotion processes. These represent a more naturalistic sample of classroom teaching performance than attendance of evaluators at prearranged sessions, so we incorporate a mixture of both for the purpose of assessment and continuous improvement. Finally, we intend to employ our lecture-capture content for the purposes of supporting distance-based education in our future part-time doctor of pharmacy (PharmD) program.

In summary, over 2 years of experience with lecture capture in an international pharmacy degree program has revealed benefits to students, faculty members, and the college in general. We are undertaking some direct quantitative and qualitative assessments of lecture-capture to confirm our empirical observations. We encourage others to consider the adoption of this teaching and learning tool as well.

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REFERENCES

1. Bollmeier SG, Wenger PJ, Forinash AB. Impact of online lecture-capture on student outcomes in a therapeutics course. *Am J Pharm Educ.* 2010;74(7):Article 127.

In reply. Thank you for the opportunity to reply to comments addressed by the faculty from the Qatar University College of Pharmacy regarding our article "Impact of Online Lecture-capture on Student Outcomes in a Therapeutics Course." We agree that the use of a historical control group may not be ideal due to the possibility of confounding factors; however, we felt that the use of a live control group was not plausible and possibly not ethical. If we had used a 2-group design (1 experimental group that could view recorded lectures and 1 control group that could not view posted lecture files), we still would have had problems matching student abilities and academic performance. This design also may have led to increased discontent with the course (presumably most in the control group). The investigators would have had no means to keep students in the control group from watching the recorded lectures with friends or classmates in the experimental group, which could have led to problems with accurate data analysis.

We feel that the use of historical controls was valid for several additional reasons. Course modifications were minimal between the historical control (2008) and the experiment group (2009). The same group of faculty members coordinated the course, served as content experts and lecturers, and discussion group leaders. The same content was covered and assessments were similar between the 2 years. Three semester examinations and a final examination were given in both 2008 and 2009. All examination questions had equal distribution of question levels using Bloom's taxonomy of recall, analysis, and application. No changes in weekly homework assignments, discussion cases, or the discussion format took place.

The decision to allow the posted files to be viewed for only 3 days following each lecture was a division of pharmacy practice decision, trying to identify the optimal way to utilize the technology, and was an attempt to encourage attendance. We understood that students not having access to posted files throughout the semester was not likely to influence their final examination grades. This inspired us to complete a follow-up study in which we looked at outcomes from students who did have access throughout their semester in Therapeutics II. These data have yet to be analyzed, but we hope it will help determine whether length of access to posted files influenced class attendance or performance (as we tracked individual student attendance and performance). Subsequent to Therapeutics II in 2009, other pharmacy practice division-wide courses did allow students to view posted lecture files for unlimited amounts of time. These courses actually saw a decrease in attendance beyond what we experienced in Therapeutics II.

The authors agree that the use of posted lecture files would be an excellent tool to promote both self- and peer assessment of teaching, and documentation of teaching abilities as well as allowing lecturers and question writers

in other courses to observe the information that was given to students in previous classes.

We look forward to the possibility of comparing the University of Qatar faculty's quantitative data to our own. It would be interesting to better understand how students utilize the lecture files when lecture attendance is required. We set out with the same empiric assessment for student use of the technology and were surprised at the apparent lack of benefit shown and low student utilization of the posted lectures.

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Observations Using Text Messaging as an Interactive Tool

To the Editor. A study of more than 6,000 students found standard lectures to be less effective than lectures which included some form of an interactive activity regardless of class size or student preparedness.[1] A classroom feedback or audience response system is 1 example of an interactive tool that can be employed to promote student achievement. The advantages of classroom feedback are well described in pharmacy education: improving student understanding of concepts; improving classroom engagement, participation, and discussion; and creating instructor awareness of student difficulties.[2,3]

According to a 2007 study of college students, 99.7% owned a mobile phone and 94% sent and received text messages.[4] In response to this growing popularity of mobile phones among college students, research using the short message service (SMS) or text messaging functionality as a response mechanism for classroom feedback has appeared in a limited number of basic science courses in the last decade. The results of a 2-year analysis of using interactive SMS in the classroom mirrored that of traditional classroom feedback technologies with improvements recorded in student engagement and classroom discussion.[5]

In addition, Web-based programs are available that offer the capability to use SMS on a much broader scale. This letter describes the use of an SMS classroom feedback in the pharmacotherapy course at the University of Missouri - Kansas City School of Pharmacy in which students were asked to take out their mobile phones to contribute to classroom learning.

Short patient cases with multiple-choice answers were developed and embedded within a PowerPoint lecture using the Web-based SMS provider Polleverywhere (Chicago, IL). The lecture was presented directly to 25 students at the near campus and broadcasted synchronously to 57 students at the distance campus. Students were asked to respond to the patient case questions via their mobile phone using SMS messaging. Students also had the option to respond using a wireless enabled laptop computer by visiting a specified Web site where responses could be submitted.

Seven poll questions were administered at approximate 20-minute intervals over a 2.5 hour lecture period. The 20-minute intervals were chosen to correspond with diminishing learner attention occurring between 10 and 20 minutes. Using the system was voluntary, and expenses incurred by text messaging were paid by students. On average more than 70% of the class responded to each poll.

At the completion of the lecture for which the text polling technology was initially incorporated, a Web-based survey instrument was made available for students to complete, gauging their perceptions of the technology. The survey instrument was completed by 48 of 82 (58.5%) students. An enhanced level of engagement was perceived by 85.4% (41/48) of students. Use in future lectures was preferred by 95.8% (46/48) of students, and a majority, 91.4% (43/47), perceived that the classroom feedback provided an educational benefit. Free-form feedback was provided by 22 students, all positive in nature, limiting speculation why 30% of the class did not participate in the polls. One student commented: "I think the text polling is a great tool. It allows you, as the instructor, to get instant feedback in regards to your effectiveness in teaching, and it allows us, as students, to get needed clarity immediately!" Another stated: "I feel that the text polls functioned to solidify material that was previously presented and at the same time reinforce the knowledge. I cannot overstate how helpful I believe this was."

This letter describes an SMS classroom feedback tool that was incorporated into a multicampus pharmacotherapy lecture with the purpose of improving student engagement and understanding of lecture material. Based on student survey feedback, this method presents a potential new way to deliver active learning. These results do not provide evidence to suggest improved learning outcomes by incorporation of an SMS classroom feedback as only student perceptions of learning and engagement were assessed. Furthermore, this article does not speak to learner preference for either clicker-based classroom feedback or SMS classroom feedback as these students were not asked to compare or provide a preference.

Possible future applications include incorporating an ongoing freeform feedback loop in which students may pose questions, submit comments, and request clarifications throughout the lecture. Professors would then have the opportunity to choose when, how, and if to respond to

freeform SMS. Further study exploring the successfulness of SMS classroom feedback in achieving active-learning principles in comparison to a control group, either no classroom feedback or traditional clicker-based classroom feedback, is indicated.

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REFERENCES

1. Powell K. Spare me the lecture. *Nature.* 2003;425(6955):234-6.
2. Cain J, Black EP, Rohr J. An audience response system strategy to improve student motivation, attention, and feedback. *Am J Pharm Educ.* 2009;73(2):Article 21.
3. Medina MS, Medina PJ, Wanzer DS, Wilson JE, Er N, Britton ML. Use of an audience response system (ARS) in a dual-campus classroom environment. *Am J Pharm Educ.* 2008;72(2):Article 38.
4. Becker M, Hanley M. Cell phone usage and advertising acceptance among college students: a three-year analysis [presentation]. AEJMC Southeast Colloquium, Auburn, Alabama, March 2008.
5. Scornavacca E. A two-year analysis of students' learning experience using interactive SMS in the classroom. Eighth International Conference on Mobile Business, June 2009; 110-114

Clinical Pharmacy and Pharmaceutical Care: A Need to Homogenize the Concepts

To the Editor. Over the last 4 decades, the pharmacy profession has witnessed tremendous practice changes, especially after the introduction of clinical pharmacy concepts in the late 1960s, followed by the philosophy of pharmaceutical care in the early 1990s[1-9]. The introduction of these concepts and philosophy in modern day pharmacy practice has transformed the pharmacist's role to focus more on patient-oriented services rather than the traditional focus on product and dispensing services. Over the years, after the successful introduction of clinical pharmacy concepts and services in the United States and Europe, the rest of the world has followed suit in transforming pharmaceutical services. Along with adopting these concepts and philosophy, these countries also need to change the existing pharmacy curriculum to provide the necessary training so that future pharmacy practitioners are equipped with the necessary knowledge and clinical skills. The impact of these changes was strong enough that even countries lacking in appropriate health infrastructure and education facilities were eager to produce future pharmacists trained in these concepts. This is evidenced by the variety of undergraduate pharmacy degrees such as doctor of pharmacy (PharmD) and master of pharmacy (MPharm) being offered to pharmacy undergraduates in developing countries. The programs in developing countries vary significantly from similar programs offered in countries such as the United States, Canada, and the United Kingdom. The main reasons for the differences in developing countries are differences in need, professional standards, and pharmacy practice. Both clinical pharmacy and pharmaceutical care are closely related concepts, although there are differences among the professional bodies that define them. For example, the United Kingdom Clinical Pharmacy Association describes clinical pharmacy as encompassing the knowledge, skills, and attitudes required by pharmacists to contribute to patient care. The European Society of Clinical Pharmacy defines it as a health specialty that describes the activities and services of the clinical pharmacist in developing and promoting the rational and appropriate use of medicinal products and devices.[5]

However, the American College of Clinical Pharmacy, in an abridged definition, describes clinical pharmacy as that area of pharmacy concerned with the science and practice of rational medication use. The practice of clinical pharmacy embraces the philosophy of pharmaceutical care; it blends a caring orientation with specialized therapeutic knowledge, experience, and judgment for the purpose of ensuring optimal patient outcomes.[1] Whatever definition we choose, the basic essence of clinical pharmacy is the provision of pharmaceutical care to the patient, which is a different and more evolved form of hospital pharmacy services. Because many developing countries are adopting this concept by providing specialized positions for their hospital pharmacists, a strong need exists to standardize this specialized pharmacy service both in terms of education as well as practice. Pharmaceutical care is defined clearly by the professional bodies mentioned, and a clinical pharmacist is the one who possesses specialized clinical pharmacy education that enables him or her to deliver pharmaceutical care. The idea must be disseminated globally so that clinical pharmacy and pharmaceutical care are understood clearly, not only by the pharmacist but also by other health care professionals, as a distinct pharmacy practice. This is necessary because the whole concept has not been understood clearly among pharmacists, and if left unchecked numerous degrees with differences in standards and concepts about clinical pharmacy will result, as witnessed with the profession of pharmacy itself over the past few decades.

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REFERENCES

1. American College of Clinical Pharmacy. The definition of clinical pharmacy. *Pharmacotherapy.* 2008;28(6):816-7.
2. American College of Clinical PharmacyWhite Paper. Clinical Pharmacist's Competencies. *Pharmacotherapy.* 2008;28(6):806-15.
3. Barber N. Pharmaceutical care and medicines management – is there a difference? *Pharm World Sci.* 2001;23(6):210-1.
4. Hepler CD. Clinical pharmacy, pharmaceutical care, and the quality of drug therapy. *Pharmacotherapy.* 2004;24(11):1491-8.
5. Franklin BD, Mil van JW. Defining clinical pharmacy and pharmaceutical care. *Pharm World Sci.* 2005;27(3):137.
6. Stuchbery P, Kong DCM, Desantis GN, Lo SK. Identification by observation of clinical pharmacists' activities in a hospital inpatient setting. *Pharm Pract.* 2007;5(1):10-6.
7. Hartvig. P. Clinical pharmacy: what to do and what to publish. *EJHP Sci.* 2009;15(1):2.
8. Smith WE, Ray MD, Shannon DM. Physicians' expectations of pharmacists. *Am J Health-Syst Pharm.* 2002;59(1):50-7.
9. Fairbanks RJ, Hildebrand JM, Kolstee KE, Schneider SM, Shah MN. Medical and nursing staff highly value clinical pharmacists in the emergency department. *Emerg Med.* 2007;24(10):716-8.

Would You Want Your Students to be Just Like *You*?

To the Editor. Get plenty of sleep, wear sunscreen, take your vitamins. These are all things that we inherently know we're are supposed to do, but it's always helpful to be reminded. I think that it's the same idea with being a role model. We all *know* we are supposed to lead by example, but an occasional reminder never hurts. There is much discussion in health care education about the principles of professionalism,[1-5] role modeling,[3] and the "hidden curriculum."[4,6] I'd like to offer my perspective on the subject to serve as a reminder of the responsibility that falls on our shoulders as educators. As a recent PharmD graduate and resident, I have been reflecting on the profound influence my teachers, mentors, and role models have had on me, both positive and negative. Now, as a rookie to the world of academia, I have begun to feel the weight of responsibility for the influence that my actions and behavior may have over future health care professionals who look to me for guidance.

As a student I had enough negative experiences that could have easily left me jaded. For instance, during the interview for my first pharmacy job, I expressed excitement for attending pharmacy school and I was asked, "Wait, you want to be a pharmacist? My God, why? You should go to dental school instead." Or as a second-year intern when I identified a potentially dangerous drug interaction and was about to call the physician, and the pharmacist said sarcastically "Don't bother. He's not going to listen to you. No one cares. Go ahead, call. I wanna see this. Go on." Or, as a third-year intern when I witnessed my supervising pharmacist hide behind the retail counter as our lead technician took all of the heat from an angry patient due to a misfilled prescription.

Luckily, I had enough positive influences along the way to make up for the negative. For example, the pharmacist who shocked me when she came out from behind the retail counter and performed a test for cogwheel rigidity on a woman who was concerned she was developing Parkinson's disease, or my former preceptor and now colleague who amazes me everyday with her poise and professionalism in every difficult situation thrown her way. Or my former residency program director and mentor who earns respect and admiration from virtually everyone he meets by exhibiting enthusiasm for our profession, expertise in his field, and engaging communication skills.

Although we can't always prevent the negative experiences from leaving a permanent impression on our students, we can at least do our part to provide enough positive influence to counteract them. We as educators are role models by default, and we need to be continually cognizant of the incredible perceptive capabilities of students. As I became painfully aware when I received my first teaching evaluations, whether the perception of a student is correct or not, one *always* exists. Therefore I propose this: instead of looking outward to change student behavior by telling them what they should be doing and how they should be acting, we need to turn the focus inward and do a healthy amount of self-reflection. Are we exhibiting the qualities, values, and behaviors that we expect from our students?

Ask yourself, would you want your students to be just like you? Do you always put the best interest of the student or patient first? Do you consistently exemplify honor and integrity? Do you show respect for others? Do your words and actions serve to advance the profession of pharmacy or to stagnate it? Do you demonstrate teamwork, professionalism, and commitment to lifelong learning? Just like when my mother tells me to wear sunscreen and take my vitamins, let's make a continual effort to remind ourselves and our peers of the lasting impact our actions have on the attitudes and perceptions of our students, and hence, on the future of our profession.

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REFERENCES

1. Hammer DP. The "A's" and "B's" of professionalism. *Am J Pharm Educ.* 2000;64(4):455-64.
2. American Association of Colleges of Pharmacy. COD Task Force. White Paper on Pharmacy Student Professionalism. *J Am Pharm Assoc.* 2000;40(1):96-102.
3. Duke LJ, Kennedy K, McDuffe CH, Miller MS, Sheffield MC, Chisholm MA. Student attitudes, values, and beliefs regarding professionalism. *Am J Pharm Educ.* 2005;69(5):Article 104.
4. Hickson GB, Pichert JW, Webb LE, Gabbe SG. A complementary approach to promoting professionalism: identifying, measuring, and addressing unprofessional behaviors. *Acad Med.* 2007;82(11):1040-8.
5. Holt SL, Lau MS, Wong FL, et al. Tenets of professionalism for pharmacy students. *Pharmacotherapy.* 2009;29(6):757-9.
6. Gardner S. Car keys, house keys, easter eggs, and curricula. *Am J Pharm Educ.* 2010;74(7):Article 133.

Are Pharmacists Prepared to be Sexual/ Reproductive Health Educators?

To the Editor. Recognition of people's sexual and reproductive health needs has gradually increased. Accepting the notion that sexual health is part of an individual's reproductive health that includes healthy sexual development, free from illness, disease, disability, and violence, are crucial. With the world population expected to reach 8.9 billion in the year 2050,[1] sexual and reproductive ill-health continue to affect women and adolescents, especially in developing countries.[2] Every year, more than 120 million couples have an unmet need for contraception, 80 million women have unintended pregnancies (45 million of which end in abortion), more than half a million women die from complications associated with pregnancy, childbirth, and the postpartum period, and 340 million people acquire new gonorrhea, syphilis, chlamydia, or trichomonas infections.[2] Other pressing issues such as incest, HIV/AIDS, sexual coercion, sexual abuse, and gender-based violence certainly need greater attention from medical professionals, including pharmacists.

Notably, pharmacists have the advantage over other health care professionals in that they have easier access to the public. In the provision of pharmaceutical care, sexual and reproductive health care undeniably constitutes a huge portion of a pharmacists' daily practice, especially in the primary care setting such as a community pharmacy outlet or government-owned health care clinics. Pharmacists have the professional and social responsibility to educate the public on sexual/reproductive health matters, as well as contributing to treatment and prevention of sexually transmitted infections (STI) and HIV/AIDS, unplanned pregnancies (especially among the young), menopausal women, abortion, and sexual violence.

There is growing evidence that pharmacists are capable of providing sexual and reproductive health care. Pharmacists have been included in various sexual health care programs that include empowering pharmacists to provide progesterone depot injection (Washington State project). Administration of subcutaneous depot medroxyprogesterone acetate (DMPA-SC) by pharmacists in a pharmacy setting was found to be feasible.[3,4] Continuation rates and patient satisfaction with DMPA-SC and the pharmacy setting were comparable to those who received DMPA-SC in a family planning clinic. Meanwhile, women who went to a pharmacy had more rapid access to emergency hormonal contraception compared to those who chose to attend a clinical service.[5] Also, Chlamydia screening for patients seeking emergency hormonal contraception at pharmacies is warranted.[6]

Despite these concerted efforts by our colleagues to make our presence felt in sexual and reproductive health care, are pharmacists truly ready to be sexual/reproductive health educators? Are we trained adequately? What are the attitudes and competency levels of pharmacists worldwide to provide pharmaceutical care in this delicate and personal area of care? How well do our young pharmacists cope when they attend to patients who complain about their sexual dysfunction problems, especially in developing countries where sex remains taboo? Are we prepared to practice evidence-based medicine in this sensitive area, knowing that the market is flooded with various herbal and supplement products enticing the public, claiming to be able to boost sexual drive or performance?

In my opinion, sexual and reproductive health topics are neglected in many pharmacy degree programs. I do think we need to reexamine the curriculum to determine whether it has addressed these issues sufficiently. Our graduates must be trained properly and possess the skills to care for the unmet needs of the public in this sensitive area. Establishment of sexual/reproductive education programs and sexual health clinics that incorporate pharmacists as educators should be considered. This is especially true in developing countries where pressing issues such as unplanned pregnancies and HIV transmissions among adolescents are increasing at an alarming rate.

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REFERENCES

1. Population Reference Bureau Staff. Transitions in world population. *Popul Bull.* 2004;1-43.

2. Glasier A, Gülmezoglu AM, Schmid GP, et al. Sexual and reproductive health: a matter of life and death. *Lancet.* 2006;368(9547):1595-607.
3. Picardo C. Pharmacist-administered depot medroxyprogesterone acetate. *Contraception.* 2006;73(6):559-61.
4. Picardo C, Ferreri S. Pharmacist-administered subcutaneous depot medroxyprogesterone acetate: a pilot randomized controlled trial. *Contraception.* 2010;82(2):160-7.
5. Black KI, Mercer CH, Kubba A, et al. Provision of emergency contraception: a pilot study comparing access through pharmacies and clinical settings. *Contraception.* 2008; 77(3):181-5.
6. Brabin L, Thomas G, Hopkins M, et al. Delivery of chlamydia screening to young women requesting emergency hormonal contraception at pharmacies in. *Manchester,* UK: *a prospective study. BMC Women's Health.* 2009;9(1):7.