Revising senior pharmacy grand rounds to incorporate longitudinal board review to prepare students for licensing examination

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Abstract

Little is known about the content of senior grand rounds (GR) or senior seminars frequently taught as a component of the Doctor of Pharmacy curriculum. Colleges and schools of pharmacy use GR to educate senior pharmacy students, showcase role models, and promote collegiality. In the past, GR at the Arnold and Marie Schwartz College of Pharmacy and Health Sciences were designed similarly and had vague overall objectives. We redesigned our GR with a focused goal to guide and prepare our graduates for licensing examination (the North American Pharmacist Licensure Examination (NAPLEX)). To assist with reaching this goal, we incorporated disease state reviews, case-based discussions, and questions designed similarly to the NAPLEX format. During the senior year, five GR sessions were conducted with our graduating class of 182 students. Each session focused on major disease state reviews, with an active-learning discussion incorporating profile-based cases and questions that students answered using audience response systems (ARS). A cumulative examination was administered during the last GR session. A survey examining student perceptions of their learning and value of GR was also conducted. Majority of students enjoyed the new pedagogical approach used in GR, and 65% felt that GR contributed to their confidence in being prepared for pharmacy licensing examination. Conclusion: we describe a new approach to senior GR in a large College of Pharmacy with a focus on preparing students for licensing examination. Student survey revealed that the students had favorable views on this revised approach to conducting GR.

\section*{Introduction}

Grand rounds (GR) or senior seminars have emerged as an important component in the Doctor of Pharmacy professional education. Modeled after GR in medical education, colleges and schools of pharmacy across the country use GR or senior seminars to educate senior pharmacy students, showcase faculty role models, and promote collegiality. The actual implementation and focus of GR vary among colleges and schools. Typically, the overall objectives are vague for this course. Data related to the methods of teaching and material presented during these sessions are scarce. In fact, Medline and Embase searches with key search terms “pharmacy grand rounds” or “pharmacy
licensure. Graduates on the licensing examination preparation close to accelerated doctor of pharmacy program rather than guiding study was to assess knowledge acquisition over time in the curriculum was identified; however, the objective of that an electronic NAPLEX-review program throughout the degree candidates are being guided or coached to prepare, and assess all of our APPEs students to help pinpoint knowledge deficiencies and provide ample practice for the course and to fulfill this graduation requirement. Previously these sessions focused on issues or case presentations in pharmaco therapeutics, pharmaco economics, pharmacy law, current professional concerns and initiatives, and innovative career pathways. Based on student feedback, many of these discussions were of minimal interest to students and were perceived as not valuable (informal feedback).

Simultaneously with GR, students start their advance pharmacy practice experiences (APPEs). During the APPEs, students are expected to continue to develop and expand their knowledge base to appropriately prepare for the NAPLEX. It should be noted that there is a 1-year gap between their last didactic courses and the licensing examination, during which their knowledge is not uniformly reinforced or assessed, with one exception. We offer a brief NAPLEX-review program taught by faculty over the course of two days at the conclusion of the APPEs year; however, attendance in voluntary and there is no assessment component. Therefore, we identified a need to continuously guide, prepare, and assess all of our APPEs students to help pinpoint knowledge deficiencies and provide ample practice prior to the licensing examination.

Although the goal was clear, the exact mechanisms to reach this goal were less well defined. Review of the literature did not identify any articles in pharmacy education journals specifically addressing how doctor of pharmacy degree candidates are being guided or coached to prepare for the licensing examination. A singular study that utilized resources available between when the subject was covered in the didactic portion of the curriculum and the senior year). The experiential sites affiliated with our College of Pharmacy serve several pharmacy programs from proximal and distant areas; through informal communication with students from other programs, it became evident that many colleges and schools of pharmacy around the country have their own unique approaches on “coaching” their graduates prior to licensure. We decided to experiment with resources available to us and to utilize GR sessions to conduct focused NAPLEX reviews, thereby addressing both need for license examination preparation, as well as student concerns about lack of interest/relevance of senior GR.

The revised senior GR now continuously reinforces knowledge related to the most common disease states and top 200 medications closer to the licensing examination, exposes students to the types of questions that are typically asked on the examination, and reinforces concepts of profile evaluation. Assessments were conducted during each session via audience response systems (ARS) and at a follow-up cumulative examination at the last GR session. In addition, students were surveyed to examine their self-assessed preparedness for the pharmacist licensing examination and general perceptions of revised GR approach.

Here, we describe changes implemented in GR format and delivery to focus on NAPLEX preparation. Although we do not attempt to attribute licensing examination performance to change in NAPLEX preparation. Although we do not attempt to attribute licensing examination performance to change in NAPLEX preparation, we believe this article shares a viable approach or one potential way to help prepare soon to be graduates for licensing examination.

Grand rounds description

All students enrolled in pharmacy GR (total enrolled = 182 students) were offered to participate in the GR evaluation. Informed consent was obtained from 176 students.

Each GR session focused on one or two major disease state reviews and included detailed information on the top 200 medications relevant to the disease state (1–2 hours), followed by a 1–2 hours active learning portion. Sessions were scheduled for 3–4 hours every five weeks between the months of September and February (Table 1). During each morning portion of the GR sessions, faculty conducted focused therapeutic area reviews with emphasis on drugs from the top 200 medications list relevant to the disease state. No new information was taught during GR (with the exception of the new information that may have become available between when the subject was covered in the didactic portion of the curriculum and the senior year). The reviews were followed by profile-based case discussions and active-learning exercises using multiple-choice questions in the NAPLEX format, with students utilizing an audience response system (ARS).

Table 1

<table>
<thead>
<tr>
<th>Grand rounds session</th>
<th>Disease state focus</th>
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<tbody>
<tr>
<td>September</td>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td>October</td>
<td>Hypertension and hyperlipidemia</td>
</tr>
<tr>
<td>November</td>
<td>Asthma and chronic obstructive pulmonary disease</td>
</tr>
<tr>
<td>January</td>
<td>Infectious diseases</td>
</tr>
<tr>
<td>February</td>
<td>Psychiatric diseases and comprehensive examination</td>
</tr>
</tbody>
</table>
During the active-learning portion, students were presented with two clinical cases in an inpatient or outpatient profile format. Each student was provided with a printed handout with the same two cases. Students were given 10–15 min to review cases in groups of 4–5. Students were instructed to review each case and develop a problem list for the patient in the case. After students reviewed each case, a PowerPoint presentation with 10–15 questions based on the case was started (total of 20–30 questions per GR session). The cases and questions were designed to mimic the NAPLEX format based on NAPLEX preparatory resources. The questions focused on the top 200 prescription medications as well as general pharmacotherapeutic issues related to the topic reviewed during the GR session.

Students were asked to answer each question individually by using ARS within a ten second time frame. Immediately after responses were collected from students, the aggregate results with statistics were displayed. The faculty facilitator then discussed the correct and incorrect answers and clarified any misconceptions. Average scores for individual ARS sessions during GR were approximately 50% (variable with each session).

During the last GR session, a cumulative paper-based examination, which compiled of questions from focused discussions, was administered. About 1.5–4.5 months had passed between the GR sessions and the cumulative examination. Questions included in the cumulative examination were similar to questions discussed during each of the focused sessions throughout the year. The questions were selected to be included in cumulative examination if they related to one of the top 200 prescription medications and could be answered without a specific patient case discussed in detail in GR sessions. All questions selected for the cumulative examination were classified into knowledge or comprehension cognitive domains based on Bloom’s taxonomy of educational objectives. The cumulative examination average was 71.8% (mode 73.26%).

A survey that examined student perceptions of the value of conducting focused reviews throughout their senior year was administered. The survey was developed by the lead authors of the study and peer-reviewed by faculty within the Division of Pharmacy Practice and Pharmaceutical Sciences. This survey instrument was reviewed and granted exempt status by the Long Island University Institutional Review Board.

The paper-based survey consisted of 12 questions. Each item had five possible answers (strongly agree, agree, disagree, strongly disagree, and don’t know or not sure). Question number 12 allowed students to write additional comments about GR structure and delivery.

The findings from the survey are summarized in Table 2. The majority of students agreed or strongly agreed that focused disease state reviews, NAPLEX format profile

<table>
<thead>
<tr>
<th>Survey questions</th>
<th>Agree to strongly agree (%)</th>
<th>Don’t know or not sure (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Focused disease state reviews during grand rounds were useful in preparing me for licensing examination</td>
<td>89</td>
<td>7</td>
</tr>
<tr>
<td>2. NAPLEX* format case-based questions during grand rounds were useful in preparing me for licensing examination</td>
<td>87</td>
<td>10</td>
</tr>
<tr>
<td>3. Clicker technology used during grand rounds was useful in finding out my knowledge strengths and deficiencies</td>
<td>94</td>
<td>2</td>
</tr>
<tr>
<td>4. The format for grand rounds using focused disease state reviews should be utilized in the future</td>
<td>96</td>
<td>0.6</td>
</tr>
<tr>
<td>5. The format for grand rounds using NAPLEX* format questions should be utilized in the future</td>
<td>96</td>
<td>1</td>
</tr>
<tr>
<td>6. Grand rounds improved my top 200 drugs knowledge</td>
<td>67</td>
<td>8</td>
</tr>
<tr>
<td>7. Grand rounds contributed to my confidence in being prepared to take licensing examination</td>
<td>65</td>
<td>12</td>
</tr>
<tr>
<td>8. NAPLEX* review course contributed to my confidence in being prepared to take licensing examination</td>
<td>48</td>
<td>30</td>
</tr>
<tr>
<td>9. Advanced pharmacy practice experiences contributed to my confidence in being prepared to take licensing examination</td>
<td>88</td>
<td>5</td>
</tr>
<tr>
<td>10. Top 200 examinations in my pharmacotherapeutics courses contributed to my confidence in being prepared to take licensing examination</td>
<td>77</td>
<td>6</td>
</tr>
<tr>
<td>11. PCOA** contributed to my confidence in being prepared to take licensing examination</td>
<td>32</td>
<td>11</td>
</tr>
<tr>
<td>12. What other topics or formats would you recommend to include in grand rounds to help you prepare for licensure examination?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* North American Pharmacist Licensure Examination.
** PCOA: Pharmacy Curriculum Outcomes Assessment.
case-based questions, and using ARS during the GR were beneficial and should be utilized in the future (89%, 87%, and 94%, respectively). A lower percentage of students (65%) agreed or strongly agreed that GR contributed to their confidence in being prepared to take the licensing examination. Students provided lower ratings for most questions related to their confidence level in being prepared to take licensing examination. Most students ranked advanced pharmacy practice experiences as the most important contributor to their confidence in being prepared to take the licensing examination (88%). Twenty-three students responded to the open-ended question (question #12). The most common suggestion by students was to include topics such as human immunodeficiency virus therapies, oncology, and neurology into GR topic reviews.

Discussion

We describe a new approach to pharmacy GR in a large College of Pharmacy to guide and prepare our graduates for the NAPLEX. Individual ARS sessions scores were low. Several factors might have contributed to this finding. First, these ARS sessions were perceived more as active-learning sessions, rather than assessments, and had no stakes. Second, in addition to simply not choosing the best possible answer, low response rates may have occurred because students did not have a sufficient amount of time to answer the proposed question. In fact, response rates were 102–153 for individual questions during GR sessions while 182 responses were expected, far from 100% participation. This may indicate that some students might require more time for processing and answering the question. During NAPLEX, students have 4 hours to answer 185 questions, or over one minute per question. While giving more than one minute to answer the question using ARS is excessive and will likely result in loss of control of the class, increasing the response time is something we will take into consideration in the future. Additional possibilities for such low scores include lack of enthusiasm for participating in active-learning sessions and questions’ ambiguity.

The cumulative examination average was 71.8%. We originally thought that students would achieve close to a perfect score on the cumulative examination administered at the end of the senior year, since similar questions were already asked and any misconceptions were clarified during each of the GR sessions. Despite the fact that performance on assessments after each GR session was not optimal, we thought that since the answers were provided to students, they would remember their deficient areas and answer similar questions correctly when asked again. However, performance on the cumulative examination was average. The fact that students did not remember answers to similar questions asked on a later date could potentially be explained by the time that passed between the cumulative examination and each GR session. When asked to answer the questions during the cumulative examination, students may have forgotten the information, consistent with the concept of some degree of knowledge loss over time. Although some degree of decline in knowledge over time is expected based on scarce data from medical and nursing education literature, it is unclear what is the rate of such decline and how it relates to the complexity of knowledge that is to be retained and to the time passed.8,9 We compared student performance on cumulative examination on questions from earlier and later GR sessions and did not identify a clear pattern of time effect on knowledge retention.

An additional potential contributing factor is the fact that both post-GR assessment and cumulative examination had no stakes. Recent findings demonstrate that students may put low efforts into no stakes examinations, diminishing the accuracy of assessment.10 Students taking the post-GR assessments and the cumulative examination might not have perceived them seriously, and, therefore, might not have taken the time to review their deficient areas prior to the cumulative examination, thus performing poorly on some questions. In subsequent years, we will consider requiring a passing score on the cumulative examination in order to achieve passing grade for GR, and will evaluate the impact of such change on examination results.

What we hoped to achieve is for students to discover their knowledge gaps and deficiencies both at the GR sessions and after reviewing their cumulative examination results, and to address these areas when preparing for their licensure examination. This makes a case for stressing the importance of reviewing the most challenging material close to the date that students will be taking their licensing examination.

Survey results generally revealed positive attitudes towards conducting GR sessions in this new format. One of the survey items examined students’ attitudes towards use of ARS during GR as a tool to identify knowledge strengths and deficiencies. We implemented the use of ARS in GR based on several positive studies in pharmacy literature examining student performance in classes utilizing this technology.11,12 Current Accreditation Standards and Guidelines for the Professional Program in Pharmacy leading to the Doctor of Pharmacy Degree also recommend utilizing active-learning strategies and instructional technologies to facilitate critical thinking and problem-solving skills.13 Several active-learning pedagogical strategies are being used in our professional curriculum; however, at the time of this project, we did not routinely use ARS in our didactic courses. A large class size has been identified as one of the factors that can hinder the implementation of active learning; however, the use of ARS is one of the feasible ways to implement effective active learning in a pharmacy class of our size (approximately 200).11 Utilizing this technology along with profile case-based discussions was a unique
experience for our senior class, and, based on the survey results, students responded positively to using this method during GR case discussions.

An additional item of interest included students’ self-rated confidence levels of being prepared for licensing examination. One-third of the students did not feel confident that GR were helpful in preparing them for their licensure examination, since perhaps they were discouraged by how they performed on the post-GR assessments and cumulative examination. In addition, students might not have been familiar with the content areas and blueprint of the pharmacist licensing examination while taking the survey, which might have played a role in their responses.

Limitations

We cannot extrapolate individual sessions or cumulative examination performance to predict performance on the NAPLEX. The testing environment that was used in GR and the time allotted for the cumulative examination did not simulate the licensing examination, which is a computer adaptive examination consisting of 185 questions. Although it was not feasible to conduct a simulated NAPLEX for our large class during GR, we believe the assessments that were conducted provided valuable guidance to students on the potential content areas of the examination and their individual knowledge deficiencies.

We also need to address other initiatives that took place simultaneously with our implementing the new GR approach. These initiatives had goals that were similar to revised GR, and included an examination on top 200 medications (top 200 examination) and a Pharmacy Curriculum Outcomes Assessment (PCOA) remedial program (required for students who performed poorly on the PCOA examination). The top 200 prescription medications examinations cover top 200 most commonly prescribed medications. These examinations are administered in all pharmacotherapeutics courses (five courses between professional years one and three) and focus on therapeutic indication, black box warnings, absolute contraindications, usual dosage range for Food and Drug Administration (FDA)-approved medications, and top three adverse drug reactions. The last examination in the spring semester of the third professional year is cumulative. Students then start their APPEs, and are expected to continue to grow and expand their knowledge base of commonly encountered pharmacotherapeutic areas and top 200 medications. Although we believe that revised pharmacy GR addressed the 1-year gap between the last top 200 examination and the licensing examination and provided an opportunity to continuously review important information closer to graduation and licensure, we cannot exclude that this or other initiatives had a stronger influence on NAPLEX preparedness than GR.

Ultimately, a correlation between student performance during GR and national validated examinations would be valuable to objectively evaluate students’ readiness and preparedness for licensing examinations.

Conclusion

We describe a new approach to senior GR in a large College of Pharmacy with a focus on preparing students for licensing examination. A student survey revealed that the students had favorable views on the new approach during pharmacy GR sessions aiming at improving their preparedness for licensing examination. Data from this GR-program evaluation will be used to improve GR in the future years.

References


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