

## RESEARCH ARTICLES

### Perceived Utility of Pharmacy Licensure Examination Preparation Tools

Amy Sutton Peak, PharmD<sup>a</sup>, Amy Heck Sheehan, PharmD<sup>b</sup>, and Stephanie Arnett, PharmD Candidate<sup>a</sup>

<sup>a</sup>College of Pharmacy and Health Sciences, Butler University

<sup>b</sup>School of Pharmacy and Pharmaceutical Sciences, Purdue University

Submitted May 24, 2005; accepted August 27, 2005; published April 17, 2006.

**Objectives.** To identify board examination preparation tools most commonly used by recent pharmacy graduates and determine which tools are perceived as most valuable and representative of the actual content of licensure examinations.

**Methods.** An electronic survey was sent to all 2004 graduates of colleges of pharmacy in Indiana. Participants identified which specific preparation tools were used and rated tools based on usefulness, representativeness of licensure examination, and monetary value, and provided overall recommendations to future graduates.

**Results.** The most commonly used preparation tools were the Pharmacy Law Review Session offered by Dr. Thomas Wilson at Purdue University, the *Complete Review for Pharmacy, Pre-NAPLEX, PharmPrep*, and the *Kaplan NAPLEX Review*. Tools receiving high ratings in all categories included Dr. Wilson's Pharmacy Law Review Session, *Pre-NAPLEX, Comprehensive Pharmacy Review, Kaplan NAPLEX Review*, and *Review of Pharmacy*.

**Conclusions.** Although no preparation tool was associated with a higher examination pass rate, certain tools were clearly rated higher than others by test takers.

**Keywords:** licensure, examination, North American Pharmacist Licensure Examination, Multistate Pharmacy Jurisprudence Examination, license

## INTRODUCTION

The North American Pharmacist Licensure Examination (NAPLEX) is designed to assure that pharmacy school graduates seeking entry into the profession have the appropriate knowledge, judgment, and skills that an individual is expected to demonstrate as an entry-level pharmacist. Correspondingly, the Multistate Pharmacy Jurisprudence Examination (MPJE) is designed to test a pharmacy graduate's mastery of pharmacy law. Prior to taking these important examinations, most pharmacy graduates rely on the assistance of various licensure examination preparation tools to aid in their study approach. Several different preparation tools are available for this purpose, including review textbooks, mock examinations, testing coaches, and review courses.

Previous studies have evaluated potential relationships between academic performance, admission characteristics, student employment experiences, and successful NAPLEX completion.<sup>1-6</sup> Investigators have also reported

that various preparation methods can significantly improve a candidate's overall confidence and satisfaction that they will successfully pass the board licensure examinations.<sup>7</sup> However, no assessments regarding the perceived utility of various preparation tools have been conducted after candidates have taken the pharmacy licensure examinations. As the number of available preparation tools continues to grow, so does the need to distinguish high-quality versus low-quality tools.

The objectives of this study are (1) to identify what preparation tools are most commonly used by recent pharmacy graduates seeking licensure in Indiana and (2) to determine which of these preparation tools are perceived to be the most valuable and representative of the actual content of the licensure examinations.

## METHODS

Available pharmacy licensure preparation tools were identified via literature and Internet searches. Following the identification of the available preparation tools, a survey was created. Approval from the investigational review boards at Butler University and Purdue University was obtained. The survey instrument was then distributed to 2004 graduates of the 2 schools of pharmacy within

---

**Corresponding Author:** Amy Peak, PharmD, Butler University College of Pharmacy and Health Sciences, 4600 Sunset Avenue, Indianapolis, IN 46208-3485. Tel: 317-940-9870. Fax: 317-940-8520. E-mail: apeak@butler.edu

the state of Indiana. The survey was created using *Dreamweaver* software (version 6.0, Adobe Systems, Incorporated, San Jose, Calif) and was conducted electronically.

The survey collected demographic data including age, gender, university attended, and cumulative grade point average (GPA) upon graduation. Participants were asked whether they completed the NAPLEX and if they passed the examination on the first attempt. Participants were also asked whether they completed the MPJE or other type of law examination and whether they passed that examination on the first attempt. Participants were asked if they used any specific examination preparation courses, review sessions, texts, programs, or pretests to prepare for the pharmacy licensure examinations. If preparation tools were used, participants indicated which specific tools were used and scored those tools (using a 5-point Likert scale) in relationship to utility, representativeness of the actual licensure examination, monetary value, and overall recommendation to future graduates.

An electronic mail message was sent to all 2004 graduates of Indiana schools of pharmacy, explaining the study, requesting their participation, and providing a link to the electronic survey instrument. Two weeks following the initial electronic mail, a second message was sent reminding graduates about the study, requesting their participation, and providing the link to the electronic survey web site.

## RESULTS

The survey instrument was sent to 217 graduates, 80 from Butler University and 137 from Purdue University.

Six survey messages were returned undeliverable, thus 211 graduates were actually invited to participate in the survey. Sixty graduates responded to the survey, resulting in a response rate of 28.4%. The demographic profiles of the respondents are similar to those of the entire population surveyed (Table 1.) All respondents completed and passed the NAPLEX on their first attempt. Fifty-six of the 60 respondents (93.3%) completed the MJPE examination and 4 completed other pharmacy law examinations. Fifty-nine respondents (98.3%) passed the law examination on their first attempt. Fifty-nine respondents used at least one preparation tool prior to taking the licensure examinations. The one graduate who indicated that he/she did not use any preparation tools completed and passed the NAPLEX and the MJPE on the first attempt and had a cumulative GPA in the 3.5 to 4.0 range at the time of graduation.

Seventeen specific pharmacy licensure preparation tools were identified and evaluated in this survey. Two tools, *NAPLEX Secrets*<sup>8</sup> and the online *Pharmacy Exam Review Course for US Educated Students*<sup>9</sup>, were not used by any participants. Fifteen tools were used by at least 1 participant (Table 2.<sup>10-22</sup>) Nine participants also used other preparation tools not specifically identified in the survey. These tools included the Illinois pharmacy law review session offered at the University of Illinois at Chicago, the *Missouri Law Handbook*, the Ohio Board of Pharmacy review, and 2 employer-specific review courses.

The number of preparation tools used by each respondent averaged 2.9 and ranged from 0 to 6. The most commonly used preparation tools included Dr. Thomas Wilson's

Table 1. Demographic Profile of PharmD Students Invited to Participate in a Survey to Determine the Utility of Pharmacy Licensure Examination Preparation Tools

Variable	PharmD Graduates, Butler University, % (N = 80)	PharmD Graduates, Purdue University, % (N = 137)	Survey Participants, % (N = 60)
Gender			
Male	25	25.7	21.7
Female	75	74.3	78.3
Cumulative GPA*			
2.0-2.4	0	0	1.7
2.5-2.9	13	32.4	11.7
3.0-3.4	58.8	42.6	43.3
3.5-4.0	28.8	25.0	43.3
Age range, y			
22-25	81.3	63.2	73.3
26-29	11.3	22.8	18.3
30-35	3.8	8.8	3.3
36-40	2.5	1.5	3.3
>40	1.3	3.7	1.7

\*4-point scale

Table 2. Summary of Pharmacy Licensure Preparation Tools Used by Survey Respondents

<b>Preparation Tool</b>	<b>% of Students Using</b>	<b>Usefulness Score</b>	<b>Monetary Value Score</b>	<b>Representative Score</b>	<b>Recommendation Score</b>	<b>Overall Score</b>
<b>NAPLEX Preparation Tools Used by at Least 10% of Respondents</b>						
<i>Pre-NAPLEX</i> online offered by NABP <sup>10</sup>	26.7	4.50	4.06	4.88	4.63	4.52
<i>Comprehensive Pharmacy Review</i> <sup>11</sup>	15.0	4.67	4.33	4.56	4.33	4.47
<i>Kaplan NAPLEX</i> <sup>12</sup>	21.7	4.54	4.15	4.31	4.23	4.31
<i>Appleton &amp; Lange's Review of Pharmacy</i> <sup>13</sup>	10.0	4.00	4.17	4.00	4.17	4.08
<i>APhA's Complete Review for Pharmacy</i> <sup>14</sup>	48.3	4.07	4.28	3.59	3.93	3.97
<i>Appleton &amp; Lange's Quick Review Pharmacy</i> <sup>15</sup>	11.7	3.57	4.00	3.29	3.71	3.64
<i>ASHP's PharmPrep Case-Based Board Review</i> <sup>16</sup>	25.0	3.20	3.67	3.20	3.20	3.32
Indiana Pharmacist's Alliance 2004 <i>NAPLEX Exam Review</i>	10.0	3.00	3.17	3.00	2.83	3.00
<b>MPJE/Law Preparation Tools Used by at Least 10% of Respondents</b>						
Dr. Wilson's Pharmacy Law Review Session	71.7	4.65	4.60	4.14	4.79	4.55
<i>Guide to Federal Pharmacy Law</i> <sup>17</sup>	13.3	3.38	3.63	3.38	3.63	3.50
<b>Preparation Tools used by less than 10% of respondents</b>						
<i>Reference Guide for Pharmaceutical Calculations</i> <sup>18</sup>	5.0	4.33	4.33	4.67	4.33	4.42
<i>Pharmacy Licensing Exam Practice Tests</i> (CD by Manan Shroff) <sup>19</sup>	3.3	4.50	4.50	4.00	4.00	4.25
<i>MPJE State Pharmacy Law Exam</i> (CD by Manan Shroff) <sup>20</sup>	6.7	3.75	4.00	4.00	3.50	3.81
<i>Reference Guide for Pharmacy Licensing Exam - Theory</i> <sup>21</sup>	1.7	4.00	3.00	3.00	3.00	3.25
<i>Reference Guide for Pharmacy Licensing Exam - Questions &amp; Answers</i> <sup>22</sup>	1.7	2.00	3.00	2.00	1.00	2.00

Shading indicates these resources received scores  $\geq 4$  in all categories assessed and were used by  $\geq 10\%$  of survey respondents. All scores are on a 5-point scale

(an assistant professor of pharmacy practice at Purdue University) pharmacy law review session, used by 71.7% of respondents; the American Pharmacist's Association's (APhA's) *Complete Review for Pharmacy*, used by 48.3% of respondents; *Pre-NAPLEX* offered by the National Association of Boards of Pharmacy (NABP), used by 26.67% of respondents; the American Society of Health-System Pharmacists' (ASHP) *PharmPrep Case-Based Board Review*, used by 25% of respondents, and the *Kaplan NAPLEX Review*, used by 21.7% of respondents. Please see Table 2 for a listing of the individual tools, their utilization rates, and their scores in each survey category.

The preparation tools used by at least 10% of the respondents and deemed most useful included the *Comprehensive Pharmacy Review* (average score of 4.67 on the 5 point scale), Dr. Thomas Wilson's pharmacy law

review session (average score 4.65), the *Kaplan NAPLEX Review* (average score 4.54), the *Pre-NAPLEX* offered by NABP (average score 4.5), *APhA's Complete Review for Pharmacy* (average score 4.07), and *Appleton and Lange's Review of Pharmacy* (average score 4.0).

The following preparation tools were used by at least 10% of respondents and found to be most representative of the actual licensure examinations: The *Pre-NAPLEX* offered by NABP (average score 4.88), the *Reference Guide for Pharmacy Calculations* (average score 4.67), the *Comprehensive Pharmacy Review* (average score 4.56), the *Kaplan NAPLEX Review* (average score 4.31), and Dr. Thomas Wilson's pharmacy law review session (average score 4.14).

The preparation tools used by at least 10% of respondents that received the highest marks for monetary value

include Dr. Thomas Wilson's pharmacy law review session (average score 4.60), the *Comprehensive Pharmacy Review* (average score 4.33), *APhA's Complete Review for Pharmacy* (average score 4.28), *Appleton and Lange's Review of Pharmacy* (average score 4.17), *Kaplan NAPLEX Review* (average score 4.15), and the NABP's *Pre-NAPLEX* (average score 4.06).

The preparation tools that respondents recommended include Dr. Thomas Wilson's pharmacy law review session (average score 4.79), the NABP's *Pre-NAPLEX* (average score 4.63), the *Comprehensive Pharmacy Review* (average score 4.33), *Kaplan NAPLEX Review* (average score 4.23), and *Appleton and Lange's Review of Pharmacy* (average score 4.17).

## DISCUSSION

Virtually all of the students surveyed used pharmacy licensure examination preparation tools. No single preparation tool was more likely to result in successful completion of the NAPLEX or MPJE. However, certain preparation tools were clearly rated more favorably than others. Of the 17 specific tools evaluated in this study, 5 frequently used tools (used by  $\geq 10\%$  of study participants) averaged scores  $\geq 4$  in all categories. Preparation tools with the highest overall ratings included Dr. Thomas Wilson's pharmacy law review session, NABP's *Pre-NAPLEX*, the *Comprehensive Pharmacy Review*, the *Kaplan NAPLEX* review, and *Appleton and Lange's Review of Pharmacy*. Although *APhA's Complete Review for Pharmacy* and *ASHP's PharmPrep* were used by a significant percentage of students (48.3% and 25%, respectively), they did not receive high ratings compared to other preparation tools. In fact, of the 10 tools that were used by  $\geq 10\%$  of survey respondents, *ASHP's PharmPrep* had the second-to-lowest overall rating. The review session provided by the Indiana Pharmacist's Alliance was the only tool with a lower overall rating.

As with all survey research, this study does have limitations. The main limitations of this study are the relatively small sample size and the possibility for response bias. The survey response rate was 28.4% (n = 60). Although the demographic information provided by our survey participants was similar to the demographic

profile of all graduates of colleges of pharmacy in Indiana, there are notable differences between the cumulative GPA of study participants compared to all graduates. Over 43% of the survey respondents graduated with a cumulative GPA  $\geq 3.5$ . Comparatively, only 26% of all graduates had a cumulative GPA  $\geq 3.5$ . Furthermore, none of the 3 individuals who failed the NAPLEX chose to participate in the survey and only 1 of the 2 individuals who failed the MPJE chose to participate in the survey (see Table 3 for a comparison of licensure examination pass rates). Academically successful students may have been more likely to participate in the survey than less successful students. We also noted a single anomaly in the data collected regarding cumulative GPA. According to university records, no student at either institution graduated with a cumulative GPA below 2.5. However, 1 survey respondent indicated that his/her cumulative GPA upon graduation was in the 2.0 to 2.5 range. We can only hypothesize that this individual either inadvertently indicated the incorrect response when choosing between GPA ranges listed in the drop-down box or was unaware of her exact GPA upon graduation.

Another potential study limitation is the restricted geographical location. This study specifically surveyed graduates of colleges of pharmacy in Indiana. The most commonly used and highest rated preparation tool is a review course focused on pharmacy law. While information obtained from this study regarding jurisprudence may be more specific to Indiana, information regarding NAPLEX preparation can be reasonably extrapolated to anyone preparing for the NAPLEX, regardless of geographical location.

The objectives of this study were to determine what preparation tools are most commonly used and to determine which of these preparation tools are perceived to be the most valuable and representative of the actual content of licensure examinations. This study was not intended to be an evaluation and/or comparison of the actual content of each of these preparation tools. Future studies comparing and contrasting the content and style of licensure examination preparation tools are needed.

As pharmacy educators, students often ask us for guidance when preparing for licensure examinations.

Table 3. 2004 Pharmacy Licensure Examination Pass Rates, %

Examination	National Average	PharmD Graduates Butler University (N = 80)	PharmD Graduates Purdue University (N = 137)	Survey Participants (N = 60)
NAPLEX	95.11	100	97.64	100
MPJE	80.10	100	98.10	98.3

NAPLEX = North American Pharmacist Licensure Examination  
MPJE = Multistate Pharmacy Jurisprudence Examination

Often the guidance provided is based predominately on personal experience or opinion. Results from this study will help pharmacy educators provide more evidence-based recommendations regarding licensure preparation.

## CONCLUSIONS

Students used an average of 3 licensure preparation tools prior to taking NAPLEX and jurisprudence examinations. The 5 preparation tools receiving the highest ratings by graduates of Indiana colleges of pharmacy are Dr. Thomas Wilson's pharmacy law review session, NABP's *Pre-NAPLEX*, the *Comprehensive Pharmacy Review*, the *Kaplan NAPLEX* review, and *Appleton and Lange's Review of Pharmacy*.

## ACKNOWLEDGMENTS

We would like to acknowledge Diane Badgley for her technical assistance with the electronic survey.

## REFERENCES

1. Hill-Besinque K, Wong WY, Louie ST, Rho JP. Predictors of success rate in the California State Board of Pharmacy Licensure Examination. *Am J Pharm Educ.* 2000;64:50-3.
2. Birdwell SE, Escovitz A. Relationships between student employment during the academic year and academic and NAPLEX performance. *Am J Pharm Educ.* 1990;54:117-20.
3. Lowenthal W. Relationships among student admission characteristics, licensing examinations and academic performance: comparison of three graduating classes. *Am J Pharm Educ.* 1981;45:132-9.
4. Manasse HR, Purohit AA, Blake MI, Barnes BA. Relationship between collegiate performance and performance on NABPLEX. *Am J Pharm Educ.* 1980;44:1-5.
5. House ML, Pevonka MP. Analysis of licensure examination performance in relation to prior internship experience. *Am J Pharm Educ.* 1980;44:134-8.
6. Lowenthal W, Wergin JF. Relationships among student preadmission characteristics, NAPLEX scores, and academic performance during later years in pharmacy school. *Am J Pharm Educ.* 1979;43:7-11.
7. Burkiewicz JS, Fjortoft NF. Effect of a review course on perceived barriers to success on pharmacy licensure examinations [abstract]. American Association of Colleges of Pharmacy Annual Meeting. *Am J Pharm Educ.* 2002;103:31.
8. Morrison Multimedia, LLC Morrison P. NAPLEX Secrets. Available at <http://www.mo-media.com/naplex/>. Accessed March 9, 2006.
9. Pharmacy Choice. Pharmacy Exam Review Course for US Educated Students. Available at <http://www.pharmacychoice.com/news/pr/rxs080602.cfm>. Accessed March 9, 2006.
10. National Association of Boards of Pharmacy. Pre-NAPLEX. Available at <http://www.prenaplex.com/>. Accessed March 9, 2006.
11. Shargel L, Souney PF, Mutnick AH, Swanson LN *Comprehensive Pharmacy Review*. 5th ed. Baltimore, MD: Lippincott, Williams, and Wilkins; 2004.
12. Kaplan Inc. NAPLEX Review Course. Available at <http://www.kaplan.com/TestPreparation/KaplanMedical>. Accessed March 9, 2006.
13. Hall GD, Reiss BS *Appleton & Lange Review of Pharmacy*. 8th ed. New York, NY: McGraw-Hill Medical; 2004.
14. In: Gourley DR, Eoff JC, eds. *APhA's Complete Review for Pharmacy*. 2nd ed. New York, NY: Castle Connolly Graduate Medical Publishing, Ltd; 2004.
15. Generali JA, Berger CA *Appleton & Lange Quick Review Pharmacy*. 12th ed. New York, NY: McGraw-Hill Medical; 2002.
16. In: Ginsburg DB, ed. *ASHP's PharmPrep Case-Based Board Review*. 2nd ed. Bethesda, MD: American Society of Health-System Pharmacists; 2004.
17. Reiss BS, Hall GD *Guide to Federal Pharmacy Law*. 3rd ed. Delmar, NY: Apothecary Press; 2003.
18. Shroff MH *Reference Guide for Pharmaceutical Calculations*. 2nd ed. Columbia: MD. Krishna Publications Inc; 2004.
19. Shroff MH. Pharmacy Licensing Exam Practice Tests CD ROMs. Available at <http://www.pharmacyexam.com/naplex.cfm>. Accessed March 9, 2006.
20. Shroff MH. MPJE State Pharmacy Law CD ROM. Available at <http://www.pharmacyexam.com/mpje.cfm>. Accessed March 9, 2006.
21. Shroff MH *Reference Guide for Pharmacy Licensing Exam- Theory*. 1st ed. Columbia, MD: Krishna Publications Inc; 2004.
22. Shroff MH *Reference Guide for Pharmacy Licensing Exam- Questions and Answers*. 1st ed. Columbia, MD. Krishna Publications Inc; 2004.