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TITLE PAGE

Comparison of self-reported NAPLEX pass rates before and after integration of formal test preparation into curriculum requirements at one College of Pharmacy

PHPR 898B Research Project II

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ABSTRACT

Specific Aims. This study assessed the relationship between formal preparation and: participant self-reported North American Pharmacist Licensure Examination (NAPLEX) pass rates; and student perception of exam preparedness.

Methods. This was a descriptive cross-sectional study using electronic questionnaires administered to students from the University of Arizona College of Pharmacy 2019 and 2020 cohorts. Questions were developed to collect data on which RxPrep components students used, their study habits, perceptions of the utility of RxPrep materials, perceived level of preparedness for the NAPLEX, and advice for future students.

Results. Survey responses were collected from cohorts 2019 and 2020 from September 2020 to March 2021. 30 responses total were received, 9 from class of 2019 and 21 from class of 2020. There was no significant difference in first-time self-reported pass rates between respondents in the 2019 and 2020 cohorts, with 89% and 100% rates respectively ($p=0.120$). All respondents successfully passed the NAPLEX, and only one student did not pass on the first attempt. NAPLEX scores ranged from 78 to 130 (mean 98, median 93). Both cohorts reported a significant increase in sense of preparedness after using the RxPrep course (2019 $p=0.0186$; 2020 $p<0.001$). There was no significant difference in sense of preparedness between the cohorts either before using RxPrep ($p=0.984$) or after using RxPrep ($p=0.680$).

Conclusions. Preliminary findings suggest that the RxPrep program is perceived to be beneficial for students preparing for the NAPLEX. This study may benefit from being repeated in future years and/or other pharmacy schools to increase sample size.

INTRODUCTION

The North American Pharmacist Licensure Examination (NAPLEX) is required to obtain pharmacist licensure in the United States. Pharmacy school graduates must complete the exam with a passing score to meet state board of pharmacy licensure requirements.¹ The RxPrep NAPLEX Course is a test preparation service designed to prepare students for the NAPLEX. The course includes a comprehensive review textbook, video lectures, online question banks, practice tests, study guides, flashcards, and a mobile application.² Use of such proprietary test preparation materials is common as prospective test-takers seek to prepare themselves for the NAPLEX exam.

NAPLEX pass rates are considered a key performance indicator for colleges/schools of pharmacy. Overall pass rates and first-time pass rates for the most recent 3 years are publicly posted to the National Association of Boards of Pharmacy (NABP) web site, listing each pharmacy program in the United States individually.¹ Academic institutions seek to improve their status as high-quality programs by actively designing curricula to improve student performance on national licensing examinations. Methods colleges and schools of pharmacy use to ensure their students pass the NAPLEX include adjustments to curricula, such as changing Advanced Pharmacy Practice Experience (APPE) length and providing students in their final year with test preparation resources.^{3,4} Students are equally eager to improve their performance on the NAPLEX, to test as soon as possible and to minimize the number of attempts before passing the exam. Failure to pass the NAPLEX on the first attempt carries sobering consequences of additional exam fees, mandatory wait periods for each subsequent attempt, and loss of potential wages earned as a licensed pharmacist.

Although there are many studies on strategies for student success on the Pharmacy Curriculum Outcomes Assessment (PCOA), few studies have been done on what strategies may improve NAPLEX pass rates.⁵ This study assessed the relationship between formal preparation and self-reported NAPLEX pass rates. In addition, it gathered information on how students use the RxPrep Course.

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METHODS

Design: This study used a descriptive cross-sectional design with data obtained through electronic questionnaires, focus group interviews, and publicly available data. This study was approved by the University of Arizona Human Subjects Protection Program.

Subjects: To be eligible for this study, participants must have been from the University of Arizona College of Pharmacy 2019 or 2020 cohorts. Participants who were not from University of Arizona College of Pharmacy, participants who had not graduated, and participants from other cohort years were not eligible. Data were comprised of responses to an electronic Qualtrics questionnaire. Participants who had not responded by the due date requested were excluded.

Intervention: The independent variable was required student utilization of the RxPrep NAPLEX Course. Students in the 2019 cohort were provided the RxPrep Course for voluntary personal use. Students in the 2020 cohort were provided the RxPrep Course and required to complete study materials (i.e., quizzes and examinations) as part of a course grade. Additional demographic data were collected in the demographics section of the electronic questionnaire. Demographic variables included graduating class membership (2019 vs 2020), pharmacy practice employment during pharmacy school, University of Arizona College of Pharmacy grade point average (GPA), age, and gender identity. Additionally, the study produced descriptive data on student self-reported use of RxPrep and exam preparation study habits.

Measures: The primary dependent variable was NAPLEX pass rates for 2019 and 2020, which are publicly available on the NABP website (2019 86%; 2020 95%). The secondary dependent variables were self-reported study habits, perceived utility of the RxPrep Course, and confidence to sit for the NAPLEX exam. An electronic questionnaire was delivered via the Qualtrics platform and consisted of 22 questions across 3 categories: RxPrep (9 questions), NAPLEX (7 questions), demographics (4 questions), and concluding (2 questions). Question response options varied between Likert scale, fill in the blank, and open-ended response. Questions were developed to target data collection on which specific RxPrep components students used, study habits, opinions about utility of

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RxPrep materials, and perceived level of preparedness for the NAPLEX. Additional questions were provided for participants to share best practices and advice for future students (see Appendix).

Data Collection: Participation in the study was voluntary and anonymous, with no incentive provided. An electronic Qualtrics questionnaire was distributed via an emailed link to the 2019 and 2020 College of Pharmacy cohorts. To achieve maximal response rate, emails were sent twice in September 2020 and twice in February 2021. Responses were accepted up to 2 weeks after the final wave was sent. Responses were stored on secure servers.

Data analysis: To assess the relationship between formal test preparation and NAPLEX pass rates, data were divided into groups based on graduation cohort year. For each cohort the number of students who reported he/she passed or did not pass were compared using a Chi Square test. The impact of required use vs non-required use of the RxPrep Course on student confidence levels was assessed using responses to questions 4 and 5. The number of students who selected each of the 4 response options (Strongly Disagree, Disagree, Agree, Strongly Agree) was recorded. Data was then stratified into groups by question number and by cohort. The number of students who felt confident before and after using the RxPrep program were compared, and p-values calculated using a Chi Square test. An a-priori alpha level of 0.05 was selected for all statistical tests. Descriptive variables and demographic variables were analyzed by calculating range, mean and median for continuous variables (i.e., NAPLEX score, time spent studying, GPA). Categorical variables were analyzed by calculating frequencies and percentages (i.e., graduating class, age range, employment during pharmacy school).

RESULTS

Survey responses were collected from cohorts 2019 and 2020 from September 2020 to March 2021. Thirty survey responses were received, 9 from class of 2019 (8%) and 21 from class of 2020 (19%). Demographics of survey respondents are reported in Table 1 and additional characteristics of interest are described in Table 2. Most students (93%) reported being employed in a pharmacy during school. 73% of students were younger than 30 years of age and 27% were 30 years or older. Self-

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reported NAPLEX scores ranged from 78 to 130 (mean 98, median 93) and self-reported GPA ranged from 3.0 to 4.0 (mean 3.58, median 3.60). Months spent studying ranged from 0.5 to 15 (mean 4, median 2) and hours per week studying ranged from 4 to 70 (mean 27, median 25).

Self-reported first-time pass rates and confidence levels are reported in Table 3 and Table 4. The 2019 cohort reported a first-time passing rate of 89% while the 2020 cohort reported a rate of 100%, however the difference was not significant ($p=0.120$). One student in the 2019 cohort reported not passing on the first attempt. Self-reported NAPLEX scores ranged from 78 to 130 (median 93). Both cohorts reported a significant increase in sense of preparedness after using the RxPrep course (2019 $p=0.0186$; 2020 $p<0.001$). There was no significant difference in sense of preparedness between the cohorts before using RxPrep ($p=0.984$) or after using RxPrep ($p=0.680$).

Both cohorts provided advice for future students preparing for the NAPLEX (Figure 1) with the most frequent suggestions being to focus on calculations, study early and frequently, and to expect negative feelings after the exam (several students reported the perception they had failed when in fact they received a passing score).

DISCUSSION

There was no significant difference in first-time self-reported pass rates between respondents from the 2019 and 2020 cohorts, with all respondents reporting successful passing of the NAPLEX. Although one student reported not passing on the first attempt, the student did ultimately report passing the exam. Both 2019 and 2020 cohorts reported a significant increase in sense of preparedness after using the RxPrep course materials, however there was no significant difference in sense of preparedness between the cohorts. Both cohorts provided detailed advice for future students preparing for the NAPLEX.

All students in both the 2019 and 2020 cohorts reported successfully passing the NAPLEX after using the RxPrep study program. There was no significant difference in first time pass rates between the cohorts, whether the students were required to use the RxPrep materials or chose to use the materials voluntarily. This supports the hypothesis that use of the RxPrep study materials contributes to

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a successful outcome when taking the NAPLEX. There are many studies on strategies for student success on the Pharmacy Curriculum Outcomes Assessment (PCOA)⁵. However, there is a lack of studies exploring exam preparation strategies for the NAPLEX using real-world NAPLEX score data⁴. This study was the first of its kind, focusing on the relationship between formal test preparation programs and student performance on the NAPLEX exam. Future research may consider repeating the electronic questionnaire in future years and/or at other pharmacy schools to increase sample size.

Students in both the 2019 and 2020 cohorts reported an increased sense of preparedness after using the RxPrep course materials, compared to their confidence before using RxPrep. This supports the hypothesis that use of RxPrep study materials correlates to increased student preparedness for the NAPLEX. To the author's knowledge, there have been no other studies conducted regarding students' subjective opinions about their confidence and readiness to sit for the NAPLEX. This study represents a novel research opportunity about the NAPLEX experience. There may be benefits in repeating the study at other pharmacy schools or in student populations using other brands of NAPLEX study programs to assess which study programs are more likely to contribute to student confidence.

All survey respondents were eager to share advice for future students preparing for the NAPLEX. The detailed comments may serve to provide final-year pharmacy students with targeted strategies for using the RxPrep program. Best practices for use of the RxPrep program are unexplored in current formal studies and may be an area opportunity for future research efforts². Future research may consider conducting focus group interviews with open-ended responses to provide further insight on students' NAPLEX preparation experience.

This study was limited due to the low response rate and may have been impacted by the psychosocial impact of the COVID-19 epidemic. Response rates were not equal between the two cohorts and other variances in demographic characteristics may represent non-response bias. The study focused on RxPrep; results may not be generalizable to other proprietary exam preparation services. Study subjects were from the 2019 and 2020 cohorts, results may not be generalizable to other cohort years due to College of Pharmacy curriculum and NAPLEX content differences.

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CONCLUSIONS

Preliminary findings suggest that the RxPrep program is perceived to be beneficial for students preparing for the NAPLEX, is associated with increased student confidence, and is associated with self-reported first-time pass rates.

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TABLES AND FIGURES

Table 1. Participant demographics (n=30)

Subgroup	no. (%)
Graduating Class	
2019	9 (30)
2020	21 (70)
Age range	
< 30	22 (73)
> 30	8 (27)
Employed as pharmacy intern or technician during school	
Yes	28 (93)
No	2 (7)

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Table 2. Participant responses to survey questions 11, 12, 13, and 20 (n=30)

Survey Item	Range (mean, median)
11. Self-reported NAPLEX* Score	78-130 (98, 93)
12. Number of months studied before taking the NAPLEX*	0.5-15 (4, 2)
13. Number of hours studied per week	4-70 (27, 25)
20. Self-reported pharmacy school GPA ⁺	3.00-4.00 (3.58 3.60)

*North American Pharmacist Licensure Examination

⁺Grade point average

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Table 3. Results for primary end point

Outcome	2019 Graduates n = 9	2020 Graduates n = 21	P value
First time pass rate - Study % (n)	89 (8)	100 (21)	0.120

Table 4. Results for secondary end points

Outcome	Strongly Agree	Agree	Disagree	Strongly Disagree	P value
Students felt confident taking the NAPLEX*					
2019 (n = 9); 2020 (n = 21)					
Before RxPrep: 2019 (2020)	0 (0)	2 (6)	4 (8)	3 (7)	0.983
After RxPrep: 2019 (2020)	5 (7)	3 (12)	1 (2)	0 (0)	0.680
2019: Before RxPrep (After RxPrep)	0 (5)	2 (3)	4 (1)	3 (0)	0.019
2020: Before RxPrep (After RxPrep)	0 (7)	6 (12)	8 (2)	7 (0)	< 0.001

*North American Pharmacist Licensure Examination

Figure 1. Participants' advice for future students (n=30)

Study calculations (n=7)			Study key topics (n=2)
Study daily (n=2)	Expect to feel bad (n=2)	Study early (n=5)	
Practice quizzes (n=2)	Pre-NAPLEX (n=2)	Use flashcards (n=1)	Make your own notes (n=1)
Watch videos (n=1)	Breaks from studying (n=1)	Time off work to study (n=1)	Relate to rotations (n=1)

*Block size denotes frequency of response

APPENDICES

Appendix A: Data Collection Form - Qualtrics Questionnaire

1. Please select all RxPrep resources you used to prepare for NAPLEX

- Course Book
- Video Lectures
- Mobile Application
- Flashcards
- Question banks
- Practice tests
- NONE of the above

2. Please select the one RxPrep resource you found MOST useful

- Course Book
- Video Lectures
- Mobile Application
- Flashcards
- Question banks
- Practice tests
- NONE of the above

3. Please select the one RxPrep resource you found LEAST useful

- Course Book
- Video Lectures
- Mobile Application
- Flashcards

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- Question banks
- Practice tests
- NONE of the above

4. BEFORE using RxPrep, I felt confident about taking the NAPLEX

- Strongly Disagree – Disagree – Agree – Strongly Agree

5. AFTER using RxPrep, I felt confident about taking the NAPLEX

- Strongly Disagree – Disagree – Agree – Strongly Agree

6. OVERALL, the RxPrep resources were adequate to prepare for NAPLEX

- Strongly Disagree – Disagree – Agree – Strongly Agree

7. I would recommend RxPrep to other students

- Strongly Disagree – Disagree – Agree – Strongly Agree

8. If RxPrep was NOT REQUIRED for a course grade (optional), I would _____ my use of RxPrep study materials.

- INCREASE – DECREASE – NOT CHANGE - - N/A (it was not mandatory for me)

9. If RxPrep was REQUIRED for a course grade (mandatory), I would _____ my use of RxPrep study materials.

- INCREASE – DECREASE – NOT CHANGE - N/A (it was mandatory for me)

10. How many times did you take the NAPLEX exam? _____

11. What was your highest NAPLEX score? _____

12. How many months before your NAPLEX test date did you begin studying? _____

13. How many hours per week did you spend studying on average? _____

14. Please select all brands of NAPLEX study materials you used.

- RxPrep

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- Kaplan
- APhA
- Mometrix
- Personal notes
- Other: _____
- NONE of the above

15. Please rate your feeling of preparedness BEFORE taking the NAPLEX

- Underprepared – Somewhat underprepared – Somewhat prepared – Prepared

16. Please rate your feeling of preparedness AFTER taking the NAPLEX

- Underprepared – Somewhat underprepared – Somewhat prepared – Prepared

17. What is your graduating class?

- 2019
- 2020

18. Age ranges

19. Were you employed in a pharmacy practice position during pharmacy school?

- Yes
- No

20. What was your final College of Pharmacy GPA? _____

21. What advice would you give future students in preparing for NAPLEX?

22. Other comments