

Assessing the effects of exam review attendance on academic performance in first-year pharmacy students

Karl R. Kodweis, PharmD; Elizabeth A. Hall, PharmD; Dawn E. Havrda, PharmD
Department of Clinical Pharmacy and Translational Science, College of Pharmacy, The University of Tennessee Health Science Center



Introduction

- Pharmacy programs are tasked with developing "Practice & Team-Ready" pharmacists with career success skills.
- Exam reviews strengthen metacognition and foster lifelong learning.
- Reviewing missed questions helps identify mistakes, improves exam-taking behaviors, and prevents future errors.

Objective

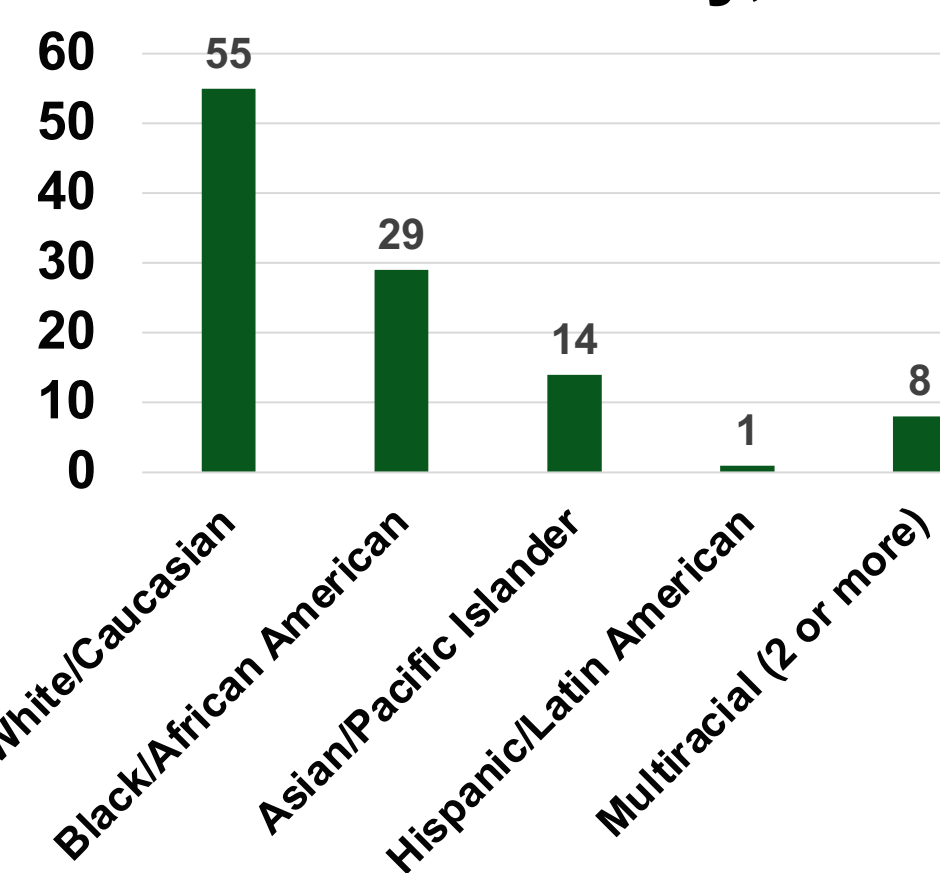
- To assess the effects of exam review session attendance on first-year students' academic performance.

Methods

- Previously, the prior Exam Review process was an individual process where the student reviewed missed questions with no rationale, notes, or discussions with classmates.
- This exam review process was revised in Fall 2022.
 - Revisions to this process allowed students to review a personalized report of missed questions with rationales in a secure, proctored location.
 - Access to technology was prohibited. However, using class notes and peer discussion was permitted among peers.
- All first-year PharmD students (n=99) enrolled were included.
- Academic performance data (including term and cumulative GPA) and the number of exam review sessions attended were collected.
 - Student demographics, including age and race/ethnicity, were also collected.
- Term and cumulative GPAs were compared with the number of review sessions attended using independent samples t-tests.
 - A p-value of 0.05 was significant.

Demographics

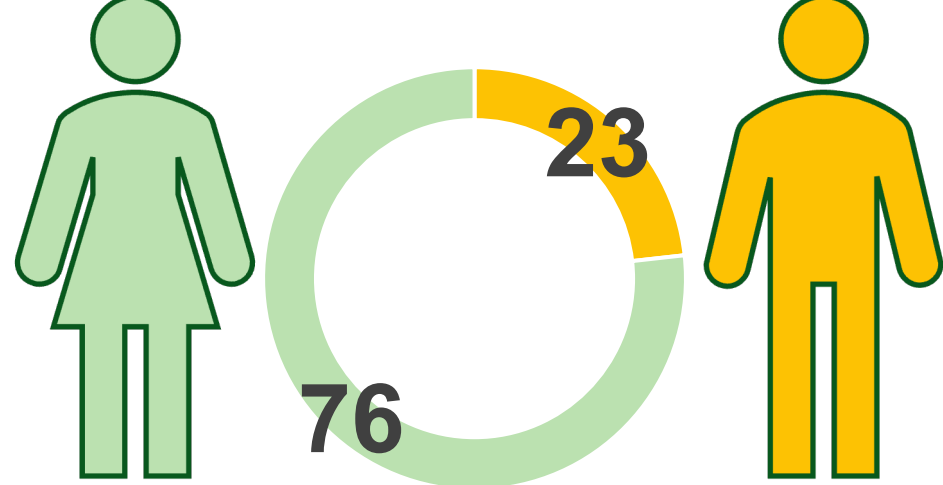
Race/Ethnicity, n



23.7

Age
mean, in years

Gender, n



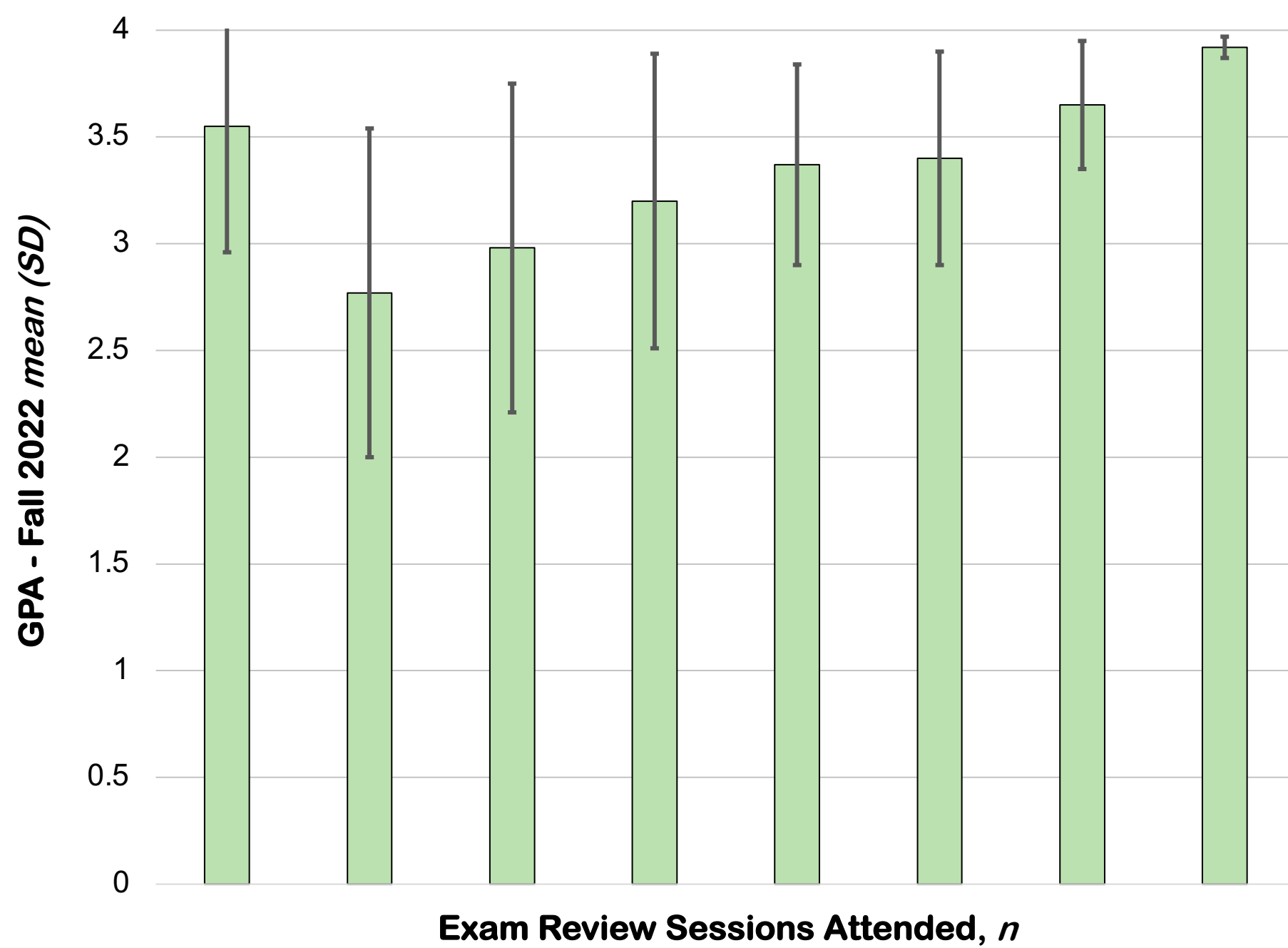
Results

	Fall 2022	Spring 2023	Year 2022/23
GPA, mean (SD)	3.36 (0.59)	3.03 (0.66)	3.24 (0.54)
Sessions attended, mean (SD)	3.87 (1.94)	3.33 (2.54)	7.20 (3.86)
Number of students, n	99	95	95

	< 50% Sessions Attended	> 50% Sessions Attended	p-value****
Fall Semester-GPA (Term)*	3.14 (0.73) n=38	3.50 (0.44) n=61	.002
Spring Semester-GPA (Term)**	3.00 (0.63) n=58	3.10 (0.70) n=37	.032
Academic Year - GPA (Overall)***	3.19 (0.55) n=48	3.30 (0.54) n=47	.336

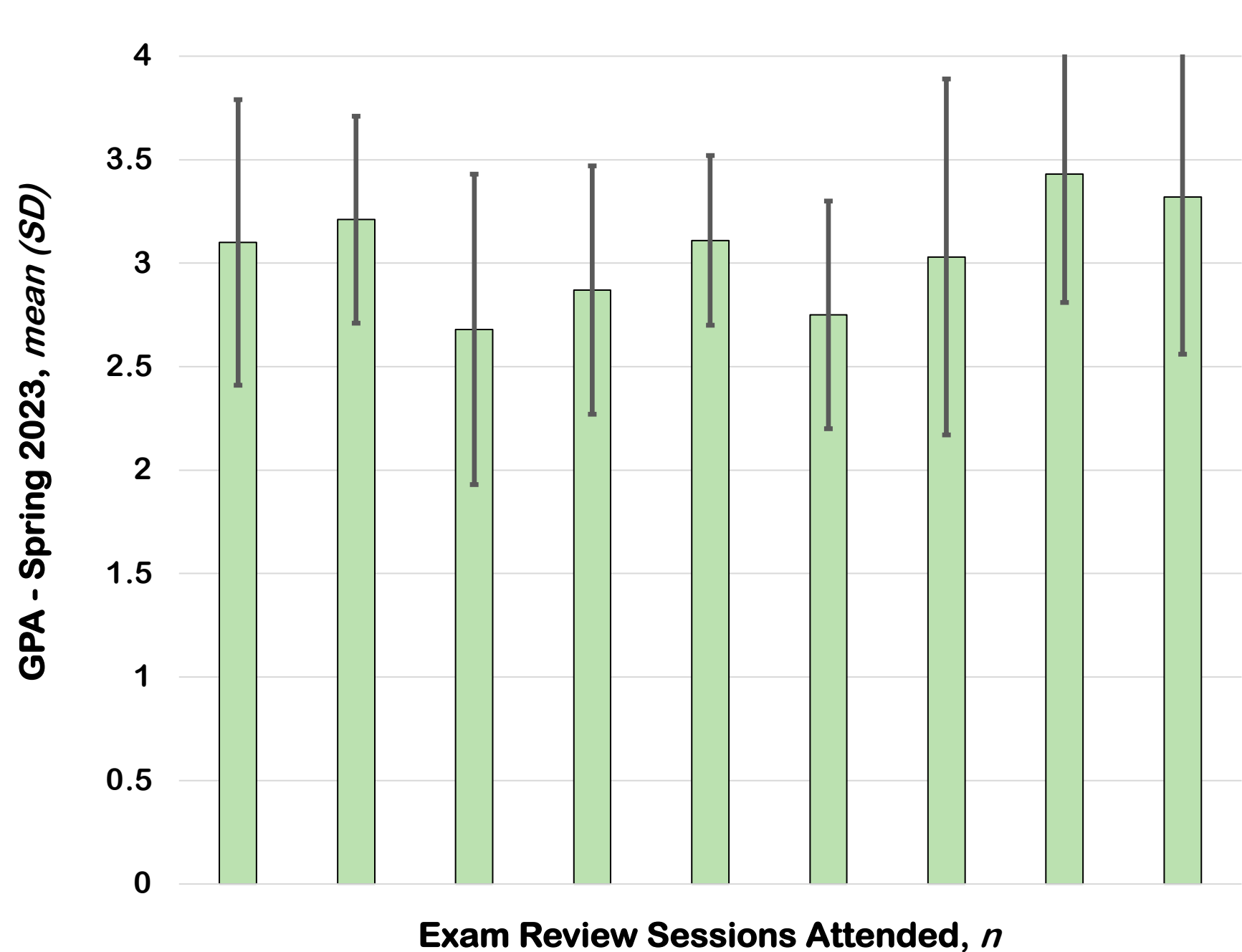
*For the Fall semester, there were 7 sessions in total: 0-3 Sessions (< 50%); 4-7 Sessions (> 50%)
**For the Spring semester, there were 8 sessions in total: 0-4 Sessions (< 50%); 5-8 Sessions (> 50%)
***For the Academic Year, there were 15 sessions in total: 0-7 Sessions (< 50%); 7-15 Sessions (> 50%)
****Independent t-test was performed to determine significant; a p-value < .05 was deemed significant

Fall 2022



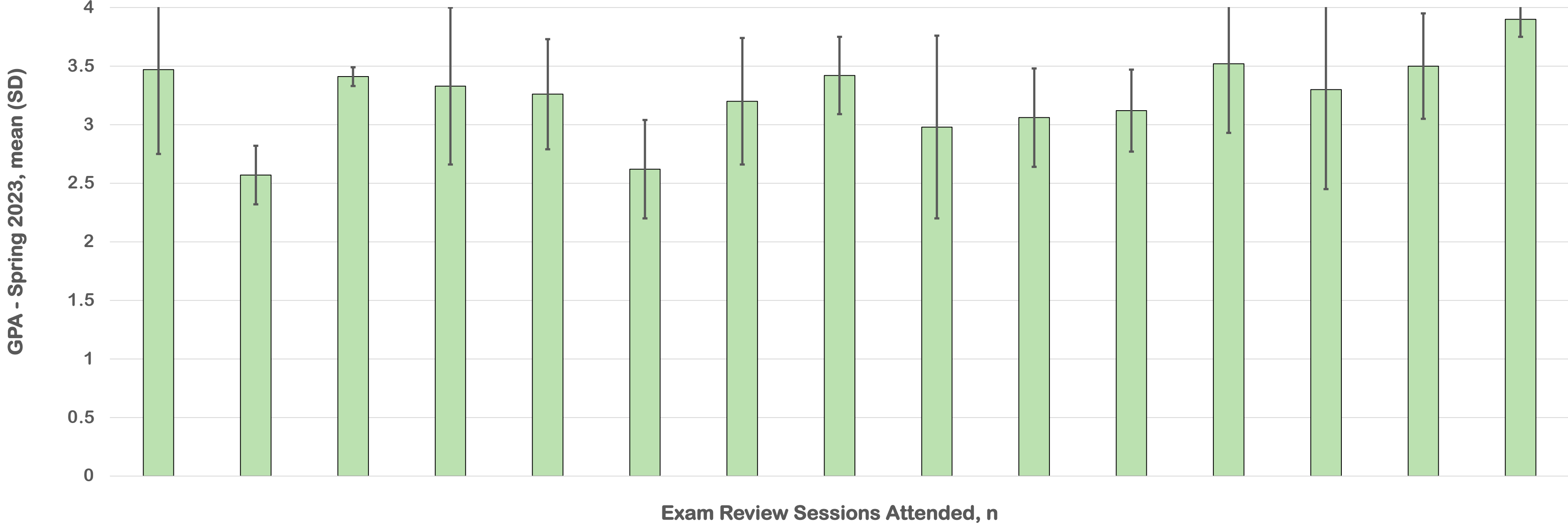
Sessions attended	0	1	2	3	4	5	6	7
GPA, mean	3.55	2.77	2.98	3.20	3.37	3.40	3.65	3.92
GPA, SD	0.59	0.77	0.77	0.69	0.47	0.50	0.30	0.05
No. of Students, n	8	6	12	12	14	23	22	2

Spring 2023



Sessions attended	0	1	2	3	4	5	6	7	8
GPA, mean	3.10	3.21	2.68	2.87	3.11	2.75	3.03	3.43	3.32
GPA, SD	0.69	0.5	0.75	0.6	0.41	0.55	0.86	0.62	0.76
No. of Students, n	14	13	12	11	8	13	8	13	3

Academic Year 2022/23



Sessions attended	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
GPA, mean	3.47	2.57	3.41	3.33	3.26	2.62	3.2	3.42	2.98	3.06	3.12	3.52	3.3	3.5	3.9
GPA, SD	0.72	0.25	0.08	0.67	0.47	0.42	0.54	0.33	0.78	0.42	0.35	0.59	0.85	0.45	0.15
No. of Students, n	5	2	2	6	11	8	4	10	3	9	11	11	4	7	2

Key Findings

- 95% of students attended one or more sessions during the 2022-23 Academic Year
 - 60% of students attended 50% of sessions held over the entire academic year
- Attendees with over 50% session attendance in both the Fall and Spring had significantly higher respective semester GPAs
 - There was no difference noted, however, in cumulative GPA analysis.
- Despite positive trends, no significant correlations are observed between the number of sessions attended and the resultant GPA on a term or academic year basis.

Conclusions

- The majority of first-year students demonstrated a strong interest/attendance with exam review sessions
- Those who attended > 50% of sessions in the:
 - Fall/Spring Term: significantly higher Fall/Spring GPAs
 - Academic Year: no significant difference in cumulative GPAs
- The revised exam process was a positive procedural change that benefits students transitioning into a professional PharmD program.
- In the future, attendance at these sessions will be added to the early intervention process for students struggling within the curriculum.
- Additional research is needed to evaluate the longitudinal effects of exam review attendance over student performance in the entire curriculum

Limitations

- Scheduling and timing of exam review sessions may have affected attendance for some students
- Data was only collected for one academic year and extended data collection may provide deeper insights
- The studied population introduces confounding variables (e.g., increasing comfort with pharmacy knowledge, acclimation to the instructor's teaching style, and assessment practices).
- Single-center study design and UTHSC COP's composite exam procedure limit generalizability to other institutions or professional programs.

References

- Schinske, J. & Tanner, K. (2014). *CBE: Life Sciences Education*, 13(2), 159-166.
- Van Langen K.M. et.al (2019). *American Journal of Pharmaceutical Education*, 83(10):7501
- Van der Vleuten C.P.M. et. al. (2010). *Best Practice & Research: Clinical Obstetrics and Gynaecology*, 24, 703-719.
- Medina, M.S., et. al. (2013). *American Journal of Pharmaceutical Education*, 77(8), 1-10.