

Incorporation of Electronic Health Record Patient Cases to Address the Pharmacists' Patient Care Process

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BACKGROUND

Electronic Health Records (EHR) in Pharmaceutical Care

- As of 2015, 97.5% of hospitals in the U.S. have a partially or completely implemented an EHR system.¹
- The 2016 ACPE Standards require the incorporation of health informatics in didactic doctorate of pharmacy curricula.²
- The use of healthcare technology is a central theme in the 2013 Center for the Advancement of Pharmacy Education (CAPE) Outcomes.³
- AACP's Core Entrustable Professional Activities for New Pharmacy Graduates suggests that entry-level pharmacists should be able to "Collect information and identify a patient's medication-related problems and health-related needs."⁴
- The Pharmacists' Patient Care Process (PPCP) highlights the importance of proper documentation of pharmaceutical care plans (Figure 4).⁵

Educational EHR Use in Pharmacy Education

- Educational EHRs are associated with improved student confidence, enhanced ability to navigate an EHR, increased student engagement, and improved documentation performance.^{6,7}
- To date, the effect of using an educational EHR on student confidence and performance in relation to components of the PPCP has not been evaluated.

OBJECTIVES

- Assess student perceptions of and confidence in various components of the PPCP after utilizing an educational EHR to write SOAP and FARM notes.
- Assess student performance in various components of the PPCP between cases provided on paper and those provided through an educational electronic health record.
- Compare overall grades on clinical documentation notes between cases provided on paper and those provided through an educational EHR.

METHODS

Spring 2017

SOAP/FARM Documentation

- Students in Capstone Course completed seven patient care plans:
 - Three notes using educational EHR
 - Four notes prepared from a written case

May 2017

Survey Administration

- Students asked to complete Student Perceptions on Utilizing an Educational EHR Survey using Qualtrics
- SOAP and FARM rubric elements mapped to components of PPCP
- IRB-approval and informed consent obtained prior to survey participation

2017-2018

Statistical Analysis

- Statistical analyses performed in SPSS v 24.0 (Armonk, NY)
- De-identified student performance data compared between written cases and cases built in the educational EHR for each step of the PPCP
- Mean and standard deviation utilized to measure differences in perceptions of and confidence in completing SOAP/FARM notes across platforms
- Differences in grades were assessed using unpaired t-tests and/or non-parametric tests as appropriate

RESULTS

Table 1. Demographics

- 79% survey response (26 of 33 students)
- Grading data analyzed for 33 students

Demographic parameter		Percent (n)
Gender	Male	42.3 (11)
	Female	57.7 (15)
Age (years)	23	23.1 (6)
	24	61.5 (16)
	25	7.7 (2)
	26	3.8 (1)
Prior EHR Experience	Yes	69.2 (18)
	No	30.8 (8)
Previous EHR source	Technician employment	15.4 (4)
	Internship employment	30.8 (8)
	IPPE Rotation	65.4 (17)
Corresponding timing of previous EHR experience	Undergraduate	12.5 (3)
	P1 year	29.2 (7)
	P2 year	50 (12)
	P3 year	29.2 (7)

Figure 1. Using the educational EHR to prepare SOAP and FARM notes has effectively trained me for practice.

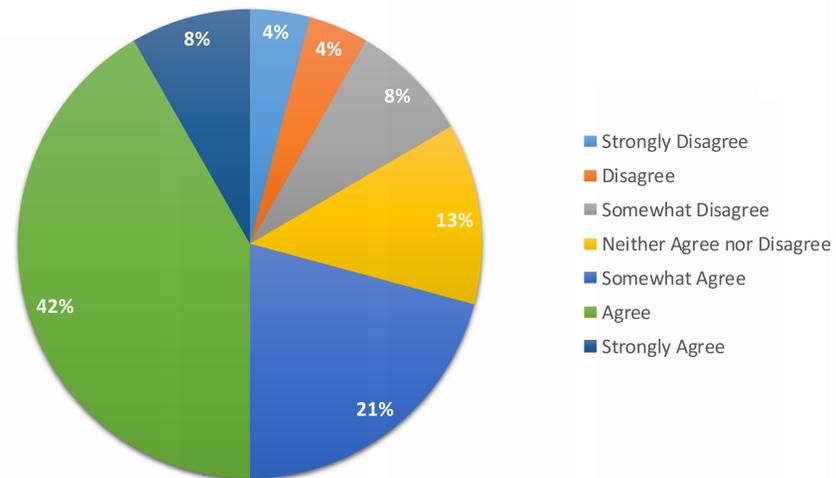


Figure 2. Which do you feel prepared you more effectively for practice?

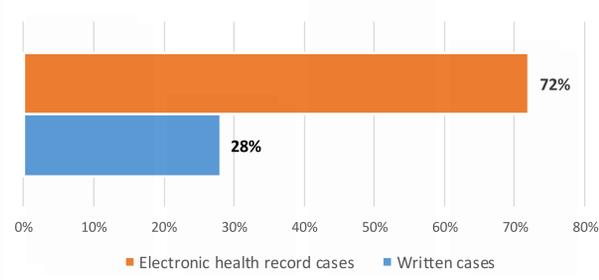
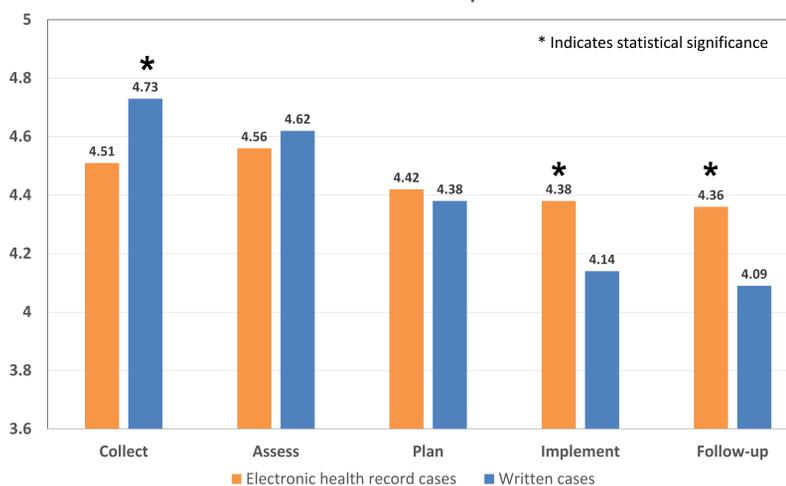


Table 2. Student perception of effectiveness of training for PPCP components

PPCP Step or Process	Written Cases* Median (IQR)	EHR Cases* Median (IQR)	Significance (p < 0.05)
Collect	5 (2 - 6)	6 (6 - 6)	0.034
Assess	6 (4.25 - 6)	6 (5 - 6)	0.566
Plan	6 (5 - 6)	6 (5 - 6)	0.272
Implement	6 (4 - 6)	6 (4 - 6)	0.715
Monitor / Evaluate	5.5 (4.25 - 6)	6 (4.25 - 6)	0.427
Collaborate	4 (3 - 6)	5 (4 - 6)	0.189
Communicate and Document	5.5 (3.25 - 6)	5 (4 - 6)	0.671

*Likert scale of 1 - 7 (1 = strongly disagree, 7 = strongly agree)

Figure 3. Comparison of mean scores for EHR and written cases based on PPCP component



Summary of Key Findings

- Students felt that EHR-based cases were more effective in preparing them for pharmacy practice.
- Student confidence in ability to collect information was significantly higher after using EHR-based cases compared to written cases.
- Scores were significantly lower for the collect step of the PPCP on EHR-based cases compared to written cases (median 5 versus 5 respectively, p=0.002).
- Scores were significantly higher for the implement step of the PPCP on EHR-based cases compared to written cases (median 5 versus 4 respectively, p=0.029).
- Grades were significantly higher for the follow-up step of the PPCP on EHR-based cases compared to written cases (median 4 versus 4 respectively, p=0.041).
- Overall scores on SOAP and FARM notes were higher for EHR-based cases compared to written cases (median 91.67% versus 86.25%, respectively, p<0.001).

Figure 4. Pharmacists' Patient Care Process⁵



DISCUSSION AND CONCLUSIONS

Conclusions

- Utilizing an EHR to create patient care plans in a Capstone course may better prepare students for practice.
- Students are more confident in their ability to collect information with the use of an educational EHR.
- EHR-based patient care plans are a useful method for assessing student performance in various components of the PPCP.

Discussion

- The EHR case data included two FARM notes, while the written case data included only one FARM note. This may have biased grading results as FARM notes focus on one patient care problem per case.

Limitations

- Data from one small cohort
- EHR and paper cases may differ in scope and difficulty
- Potential bias due to opinions of involved faculty regarding EHR use
- Potential bias due to student interest in the EHR

Future Implications

- Consider re-administering survey after completion of APPE rotations to assess changes in perceptions.
- Research on the educational use of EHRs should continue as uptake of technology progresses in pharmacy practice settings.

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