The Impact of Interprofessional Education and Practice on Medical Scribe Success Working in the Emergency Department

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Medical scribes assist health care providers with medical documentation, thus freeing providers' time for clinical work. In 2015, Grand Valley State University (GVSU) partnered with Helix Scribe Solutions (HSS) to educate medical scribes with classroom and clinical training, including interprofessional education (IPE) created by the Midwest Interprofessional Education and Research Center. This study explored the impact of an academic scribe training program, including the effect of IPE on scribe student perceptions of teamwork and to determine the factor(s) associated with scribe documentation recording accuracy. From August 2016 to October 2018, 196 students consented to participate. Students were asked to complete the Interprofessional Education Perception Scale (IEPS) and Entry Level Interprofessional Questionnaire (ELIQ) tools before and after their educational program. Differences between overall pre- and post-questionnaires were significant ($p<0.05$). IEPS subscales, Perception of Need for Cooperation, Perception of Actual Cooperation, and Understanding Others' Values were significant ($p<0.05$). The ELIQ subscale Interprofessional Interaction showed significant positive scoring ($p<0.05$). Program evaluations showed the curriculum prepared the students to work in emergency department interprofessional teams. Logistic regression modeling indicated that students' grade point average was significant in predicting whether a scribe would have fewer deficiencies per chart on average as scribe employees. *J Allied Health* 2021; 50(4):263–268.

MEDICAL SCRIBES are a major, emerging, new workforce group in the United States. Medical scribes assist providers with patient care documentation at the bedside, in real-time, and are usually unlicensed allied health professionals. Emergency Department staff have used scribes to assist with patient documentation as early as 1974.[1] The increased digitalization and standardization of medical records that resulted from the Affordable Care Act (ACA)[2] has stimulated the growth of this workforce.[3] With the increased complexity of electronic health record (EHR) charting, documentation can occupy as much as 44% of a provider's time.[4] Clinical environments under pressure for productivity and efficiency are well suited for the integration of medical scribes.

To meet an increased need and to provide role clarification, the Joint Commission defined a scribe as "a trained medical information professional who specializes in charting physician-patient encounters."[5] According to the Joint Commission, scribes should be trained on the safe use of EHRs before working in the highly regulated healthcare environment. A recent federally funded study reported that properly trained medical scribes can safely use EHRs and improve documentation quality.[6] Medical scribes should also be prepared to work in environments that require interprofessional teamwork, mutual respect, and open communication.[7] However, the literature is limited on how scribe education impacts work performance.[8–11]

Scribe education focuses on medical documentation competency to identify and document key elements of the history of present illness (HPI), physical exam (PE), and review of systems (ROS). Most scribes are required to document a majority of the patient visit which requires proficient knowledge and practical use of medical terminology, medication information, the pathophysiology of body systems, coding and billing, laboratory definitions and values, and medical equipment, among others.

With increased emphasis on patient care quality and safety, providers and policymakers recognize that healthcare workforce shortages necessitate increased collaboration and teamwork across health professions.[12] Uti-

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lizing interprofessional collaborative practice is essential to optimally educating the next generation of healthcare practitioners and improve collaborative practice.[13] For scribes to work effectively on interprofessional teams, they must learn effective communication techniques.

Helix Scribe Solutions, a for-profit scribe staffing company, partnered with Grand Valley State University (GVSU) to create the GVSU Scribe Academy. Graduates from the Academy become part-time medical scribes through Helix working in emergency departments. When developing the program, the authors discovered for-profit companies had designed scribe workforce training and employment programs, but limited sharing of curricular details.[8–10] GVSU faculty and staff created the curriculum for the GVSU Scribe Academy that includes 40 hours of theory and 40 hours of clinical training. Scribe didactic knowledge is assessed by passing an examination of the theory portion with a minimum of 85% to be eligible for clinical training. Curriculum information is located in Appendix 1. As partners of the Midwest Interprofessional Practice, Education, and Research Center (MIPERC), elements from the core IPE content was incorporated into the Academy curriculum. MIPERC was established in 2007 as an inter-institutional infrastructure to transform healthcare education and practice.[12–14] Interprofessionl education (IPE) was added to the curriculum to smooth the process for scribe students integrating into the emergency department team. The content includes IPE core competencies, the scope of practice and professional role blurring, patient safety, effective communication behaviors, and team conflict and resolution. The Academy training is free for all eligible students, with the agreement to commit to this program and employment for at least 18 months.

A study was developed to determine the usefulness of a robust curriculum including IPE content in the scribe training and to determine factors affecting scribe student success in the program. The key questions for the study include: 1) does the inclusion of IPE content in the medical scribe training curriculum improve perceptions of interprofessional teamwork through clinical training? and 2) what characteristics from the students' application materials predict they will be successful medical scribes?

Methods

This study utilized a quasi-experimental design with the scribe program as the independent study variable. Dependent variables were collected from the scribe program application and screening materials which included typing speed, medical terminology test results, university program major, class level, career and academic goals, and grade point average (GPA). All prescreening was conducted by the GVSU Scribe Director and support staff. Scribe Academy graduates became part-time Helix Scribe Solutions employees.

This research was approved by the GVSU Institutional Review Board (IRB study #16-113-H-GVSU). Students completed an informed consent and demographic form in addition to application materials prior to starting the Academy.

Tools and Measures

Students completed the Interdisciplinary Education Perception Scale (IEPS) and the Entry-level Interprofessional Questionnaire (ELIQ) tools before starting the Academy and after their clinical rotations. Both assessments were completed online in the learning management system Blackboard®, and results were downloaded to a spreadsheet. The IEPS was tested for validity and reliability for assessing perceptions of interprofessional care.[15] This was a tool with 18 items and four subscales: competency and autonomy (CA), perceived need for cooperation (PNfC), perception of actual cooperation (PAC), and understanding others' values (UOV). The PNfC subscale addresses perceptions about the collaborative environment.

The ELIQ was used to measure dimensions of team communications and teamwork and has been tested for reliability and validity.[16] This tool contains three subscales: communication and teamwork style (CTS), interprofessional learning (ILS), and interprofessional interaction (IPIS). Total questions of 27 are divided evenly into each category utilizing a 5-point Likert-type scale. This tool categorized scores for each section into three groups: positive, neutral, and negative. Communication and style comfort items were included in the CTS subscale. Respondent's experience learning with other health professions was measured in the ILS subscale, and the IPIS included items related to collaborative practice perceptions and communication among health professions.

Scribes completed a program evaluation at the end of clinical training that included narrative questions about the course and working on the interprofessional emergency department team; as an example one question asked, "What efficiencies are gained in the emergency department by having a scribe work with a provider?" Students were asked to complete this by the program director upon the decision of their pass/fail of the clinical training.

Scribe success was measured through standardized charts drafted by Helix scribe employees. Standard monthly chart audits were conducted. A selection of 12 charts per month per scribe were audited by a team of experienced full-time Helix scribes. Charts were evaluated on three criteria including accuracy, narrative flow, and spelling and grammar. The numbers of deficiencies per chart were tracked and averaged on a central spreadsheet maintained by Helix leadership.

TABLE 1. Study Participants (*n*=174)

Characteristics	No. (%)
Gender	
Male	56 (31.5)
Female	118 (66.3)
Missing	4 (2.2)
Race	
Asian	21 (11.8)
Black or African American	6 (3.4)
Caucasian	137 (77)
Multiracial	7 (3.9)
Other	1 (0.6)
Missing	6 (3.4)
Ethnicity	
Hispanic	6 (3.4)
Non-Hispanic	167 (93.8)
Missing	5 (2.8)
Education highest degree obtained	
High school (enrolled in 4-yr college)	105 (59)
Associate degree/certificate/diploma	27 (15.2)
Baccalaureate degree	33 (18.5)
Master's degree	2 (1.1)
Missing	11 (6.2)
Prior interprofessional course	
Yes	11 (6.2)
No	162 (91)
Missing	5 (2.8)
Prior interprofessional education	
Yes	5 (2.8)
No	168 (94.4)
Missing	5 (2.8)

Data Analysis

Demographic data were summarized with descriptive statistics. The sample size, normality, and symmetry of differences were assessed to determine appropriate statistical analysis.

The direct effect on scribe student interprofessional attitudes was tested by comparison of results from instruments completed at baseline to those completed at the end of clinical training. Two assessments were utilized for this: IEPS and ELIQ. Changes in relevant knowledge and perception were tested with paired *t*-tests. This included the examination of four factors measured with IEPS. The ELIQ instrument grouped its underlying ordinal scale into three ordinal categories and so Wilcoxon matched-pairs signed rank was used.

Qualitative data from program evaluation surveys were used to examine emerging themes. The author team reviewed the results and coded responses based on common themes that emerged. The consensus was established by three of the authors. Binary logistic regression was used to look at what factors were significant in predicting scribe success. The outcome variable of interest for this model was defined as whether the student had 4 consecutive months with an average of three or fewer deficiencies per chart audit. This process is proprietary to Helix Scribe Solutions per lack of available resources in the literature. All factors were put into the model utilizing a backward method, where the variable with the highest *p*-value was removed, until only significant variables remained. Data analysis was performed using SAS Enterprise Guide 7.1 software. Significance for all tests was set at $p<0.05$.

Results

Description of study participants (*n*=194, Table 1) shows that 66.3% of participants were female, and most had not had IPE in the past.

The overall IEPS scores were positive when compared to baseline values and demonstrated significant ($p<0.05$) improvement. Table 2 shows the four measures also tested within IEPS. All but the competency and autonomy subscales were considered significant. The overall ELIQ and subscale average scores were in the positive range and were determined to show improved perception of interprofessional knowledge ($p=0.012$, Table 2).

The scribe students completed the program evaluations after 40 hours of clinical training working with emergency department providers as a team. From the 102 respondents, three themes emerged: 1) focus on patient care; 2) increased throughput; and 3) decreased workload (Table 3).

The factors entered into the logistic regression model and results are listed in Table 4: medical terminology pretest score, whether or not they had prior

TABLE 2. IEPS and ELIQ Testing Results

	Pre vs Post Test Average Difference	SD	*p*-Value
Interprofessional Education Scale (IEPS) (*n*=119)	3.24	11.15	0.002*
Competency and autonomy	0.96	6.09	0.089
Perception of need for cooperation	0.35	1.63	0.020*
Perception of actual cooperation	1.32	3.71	<0.001*
Understanding others value	0.61	2.34	0.006*
Entry-Level Interprofessional Questionnaire (ELIQ) (*n*=92)	2.37	8.88	0.012*
Communication and teamwork	−1.11	2.73	<0.001*
Interprofessional learning	−1.02	4.11	0.019*
Interprofessional interaction	2.39	6.26	<0.001*

* $\alpha \leq 0.05$.

TABLE 3. Student Program Evaluation Results

What efficiencies are gained in the ED by having a scribe work with a provider? (n=102)	No. (%)
Providers can focus more on patient care	45 (44.1)
Increased patient throughput	38 (37.3)
Decreased workload for providers	19 (18.6)

ED, emergency department.

TABLE 4. Output of Logistic Regression Analysis

Predictor Variable	Wald Chi-Squared	p-Value
Pretest	0.2221	0.638
Clinical experience	0.8485	0.357
Major	1.2414	0.265
Level of credits earned	2.6475	0.104
Last earned degree	1.9521	0.162
Typing speed	1.8948	0.169
Grade point average*	11.6090	<0.001†

* Estimate = 2.0002. † α = 0.05

clinical experience, university program major, level of credit earned, last degree earned, typing speed, and GPA. Six of the seven factors were considered insignificant with a cutoff value of p>0.05. GPA was considered a significant factor in predicting whether a GVSU Scribe Academy graduate will have three or fewer deficiencies per chart on average over 4 consecutive months as an employed scribe.

Discussion

Scribe students' perceptions of interprofessional education and practice improved from baseline to the completion of the Academy. Most students had no prior IPE and reported positive perceptions of collaborative care in their program evaluations, which is similar to research results in the literature.[17,18] All of the subscales showed statistical improvement except for an improvement in perceived autonomy. This may be attributed to the scribes' scope of practice as allied health professionals who are not directly responsible for patient care decisions (the Joint Commission).

We examined the characteristics of effective scribe students working on the emergency department team based on the quality of scribe health records. Of the factors we evaluated for successful students during the screening process, GPA showed to be the only significant. Higher GPAs may indicate a student's work ethic and desire to perform well. Other authors describing their scribe models did not find having a college background necessary, yet also stated that scribes experience a steep learning curve for completing more complex medical documentation.[9] We found students already enrolled in a higher education program with at least two semesters as full-time students are better prepared with the study habits to be successful in a higher-education-based scribe training program.

The literature shows scribe programs best prepare students to adapt to providers by including clinical training in the curriculum. An important aspect of the Academy was the 40 hours of clinical training that prepared the scribes to put the Academy theory training and IPE into practice by "follow in the footsteps" of providers without stepping on their toes.[10] Yan et al.[10] observed that provider and scribe teamwork is achieved through a trial process during shifts. The scribes in Yan et al.'s paper started scribing after having achieved certification in another health profession, contrasting with our students who did not have extensive prior clinical experiences.[10] Our data show the GVSU Scribe Academy curriculum including IPE laid the foundation for a smooth transition for building the provider and scribe team.

The GVSU Scribe Academy program evaluations provided rich data with three themes emerging from scribe student responses (Table 3). The first theme related to the student's satisfaction with their contribution to assisting providers to focus more on patient care. They reported how their role through documentation helped the providers to have uninterrupted face-to-face time with patients and time for medical decision-making and coordination of treatment plans. This study did not evaluate how the scribes helped the providers specifically, but other studies observed that scribes assist providers by adapting to their workflow.[11] The physician takes the lead, and the scribe conforms to their work habits to better fit the provider's. Providers also learn how to adapt their work for the scribe to be a more effective teammate, e.g., verbalizing physical exam findings in the room.[9,11]

The second theme that emerged was the scribe's observation of provider patient care throughput enhanced by the delegation of patient documentation. This paper's authors received feedback from providers on how GVSU Scribe Academy graduates help them with efficiency and writing high-quality, detailed, medical notes.[19] A PubMed search for "medical scribes" in April 2020 showed over 35 peer-reviewed papers reporting improved provider productivity through patients seen per shift, decreased time spent for providers documenting, and increases in relative value units. Increased productivity with a medical scribe assists with more accurate notes for improved reimbursements leading to increased revenue.[20–23] The scribe's contributions to provider improved throughput can offset the added cost for scribe training programs and staffing.[24,25]

Finally, scribes reported observing a decrease in clerical workload on providers, allowing them time to focus more on patient management. One provider told the authors that having a scribe allows them to focus more on the clinical needs for the patient, so they can focus more on the patient's problem, history, physical exam, and treatment plan.[18] This is consistent with other stud-

ies that have reported scribes decreased the time providers spent documenting in electronic medical records by 50%.[7,26] Not only do scribes assist with efficiencies in patient care flow, but they also aided providers during clinical shifts to have more time teaching residents, increasing the quality of their education.[27,28] With a greater focus on patient-related tasks, this has been shown to increase provider satisfaction.[29–32] Decreasing the documentation workload on providers is one solution to provider burnout.[33,34]

Limitations

This study investigated various aspects of a single scribe program. Our findings may not reflect the "advanced 'dual-trained' scribes" who not only focus on medical documentation but also close care gaps other health professions can delegate, such as rooming patients and motivational interviewing.[33,35] At the inception of the GVSU Scribe Academy, the eligibility criteria were established to ensure student success. These results do not reflect the medical scribe workforce not sharing these same criteria. Additionally, qualitative data could not be collected from providers to further explore the benefits of scribing and the role of the scribe as an interprofessional care team member. Lastly, the lack of an accrediting body to standardize criteria for professional certification makes it difficult to compare scribe program curriculum and quality.

Conclusion

The GVSU Scribe Academy was created to assist emergency medicine providers in meeting the growing demands of medical record documentation. Scribes are not licensed health professionals and are unable to perform patient care tasks, though they contribute to provider efficiencies by improving medical documentation and throughput and by enabling increased workload.

Including IPE in the academic core scribe curriculum had aided students naïve to the healthcare environment through clinical training and into employment. Scribe perceptions of providers and teamwork improved on both the IEPS and ELIQ subscales. The most successful scribes were those with high GPAs. Further exploration is needed on the provider's perceptions of scribe interprofessional competencies and teamwork characteristics. National standardization of scribe education would be helpful to ensure the quality of the scribe workforce.

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APPENDIX 1. GVSU Scribe Academy Curriculum

Content	Format	Hours
Scribe academy kickoff - orientation	Online	2
GVSU HIPAA & BBP training modules	Online	2
Common ED medications	Online	2
Joint Commission	Online	1
What is a medical scribe? (professional role identity)	Online	0.5
Introduction to the history of present illness note	Online	0.5
Common ED procedures and equipment	Online	2
ED radiology imaging	Online	1
Laboratory tests	Online	1
Physical exam and review of systems	Online	3
Basics of the medical note	Online	4
Basics of medical coding and billing	Online	4
Body systems/pathophysiology	Online	8
Interprofessional education	Online	1
Introduction to electronic medical record and charting simulation	In-person	3
Charting simulation, introduction to clinical training and ED	In-person	4
Comprehensive final exam	Online	1
Clinical training (5 shifts)	Clinical	40
	Total	80

ED, emergency department.