EFFECTIVE METHODS OF TEACHING ICD-10 CM/PCS

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Abstract

This study aimed to determine effective methods of teaching the International Classification of Diseases, Tenth Revision, Clinical Modification, and International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-CM/PCS). Quantitative and qualitative components, as well as evaluated and compared student evaluation from the two ICD-10 CM/PCS courses, were used to determine outcomes. The assessment concluded that students who were taught by Instructor B were more successful because of the course pack. The results of the comprehensive final exam assessment *t*-value were 2.2831, and the p-value was >0.0374, indicating a statistically significant difference. The results of the quantitative study provided evidence that the standard course pack was beneficial when studying for course quizzes and tests. It was identified that students preferred the real-life examples over the textbook's short sentence descriptions.

Keywords: ICD-10-CM/PCS; health information management; health information technology instructional design; health informatics/health information management instructional design; curriculum

Introduction

The International Classification of Diseases, Tenth Revision, Clinical Modification, and International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-CM/PCS) is the new coding system that replaced the current International of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), which was implemented in 1979. ICD-10-CM/PCS was implemented in October 2015.[1] It improved the current practice because a coder selects codes that provide more specificity about a patient's diagnosis instead of using unspecified codes.[2] Implementing ICD-10-CM/PCS will assist in increased reimbursement for hospitals and physician practices. Specificity of the codes will provide more detail about what happened to the patient for third-party payers to adequately reimburse the provider for treatment. The current coding system, ICD-9-CM, has 13,000 codes, and ICD-10-CM/PCS offers more than 70,000 codes.[3] The codes allow for a more specific selection of the diagnosis documented by the physician.

The implementation of ICD-10 CM/PCS has prompted the need for effective teaching methods to prepare students to have the skills and knowledge needed for an entry-level coding position. The resources relating to root operations, which are a significant component of the procedural coding system, were not in excessive supply compared with ICD-9-CM resources. To ensure that students were prepared for a career in coding, instructors needed to provide supplemental materials.

This study aimed to determine effective methods of teaching ICD-10-CM/PCS. Students entering the field of health information management (HIM) need to obtain knowledge and skills related to the use of the new system so that can be considered for entry-level coding positions within the field of HIM. A faculty-created course pack was developed because students were requesting more examples than the textbook offered. The faculty-created course pack included outlines of each chapter, additional coding exercises, ICD-10-CM/PCS coding updates, and diagrams of a variety of coding scenarios related to different body systems. Not all students will become coders; they may work in other areas of the revenue cycle, yet still need to have a sound understanding of ICD-10-CM/PCS.

The purpose of this study was to examine the teaching methods and compare the ICD-10-CM/PCS materials used by two faculty members within an accredited HIM program.

Background

Preparing Curriculum for ICD-10-CM/PCS

To prepare HIM students for ICD-10-CM/PCS, the American Health Information Management Association (AHIMA) suggested that HIM programs revise their curricula. However, the increased specificity of codes in ICD-10-CM/PCS required more in-depth knowledge of anatomy and physiology, pathophysiology, and medical terminology.[4] The rationale for a deeper understanding of these subjects is to ensure that the students have a solid knowledge base enabling them to apply the correct diagnosis or procedure code. AHIMA suggested that students complete a medical terminology course one semester before enrolling in a HIM program so that they could immediately apply the information learned in that course to the pathophysiology course.[5] Furthermore, AHIMA also suggested in a practice brief to adjust the hours of the coding course.[6] The HIM program at our university has dedicated 6 credits to ICD-10-CM/PCS to ensure that students are developing an understanding of the material and can apply the coding guidelines to scenarios and cases. The AHIMA practice brief also advised that faculty members should research and compare textbooks to determine if they meet both faculty and student needs.[7]

Methods

This study set out to examine effective ICD-10 CM/PCS teaching methods of two instructors. The quantitative component of this study evaluated and compared student evaluations from these instructors' two ICD-10-CM/PCS courses. Institutional Review Board (IRB) approval for the study was granted with exempt status. Exempt status at the university is defined as research conducted in established or commonly accepted educational settings, involving normal educational practices.

Appendix A and Appendix B provide approval for the exempt study.

Research Hypothesis

The following research hypothesis was proposed:

H_1: There is a statistically significant difference between the evaluations of teaching styles of the ICD-10-CM/PCS instructors.

Setting and Sample Size

The target population consisted of students who had a minimum GPA of 2.5 or above and had a C or better in anatomy/physiology and medical terminology courses at our university. The two sections of the course in the study had 16 students each. Thus, the study utilized a convenience sample.

Instrumentation and Measures

This section provides detail relating to the university's student evaluation feedback on teaching effectiveness. Data were collected from the student evaluations, which assessed the effective teaching methods of ICD-10-CM/PCS. The data includes student evaluations of the course, assignments, and assessments and teaching effectiveness. Eighteen questions of the student evaluation address teaching effectiveness. The instructor scores are out of 5.0, and student comments were compiled to identify any changes that should take place to the course.

Assignments and Assessments

Data collection for ICD-10-CM/PCS assignments was done by assigning the worksheets (Appendix C and Appendix D) in the course pack for homework and providing the students with several assessments throughout the semester.[8] The assessments included pop quizzes, tests about body systems, and a two-part final exam consisting of theory and practical application. Student grades were evaluated to determine retention and understanding of the guidelines and process of ICD-10-CM/PCS coding. Because the students are learning a skill, it is important that they can retain knowledge of the guidelines and apply it within the process of coding. The grades earned by students were through objective tests. Test questions were based on ICD-10-CM/PCS coding guidelines. Cumulative grades came from assessments and assignments. These assignments and assessments were reviewed and compared to the teaching techniques and ICD-10-CM/PCS coding guidelines to ensure student comprehension of the material. If inconsistencies were identified, the teaching techniques were re-evaluated and adjusted by adding more detail to the course pack or providing additional handouts for practice and retention.

Data Collection

Data collection for the effective teaching methods for ICD-10 CM/PCS included assignments, assessments and teaching evaluations. Assignment consisted of homework worksheets covering the guidelines and rules of coding. Assessments consisted of quizzes and test covering the different body systems, and inpatient and outpatient services. A second data collection was conducted, utilized by the university's teaching evaluation form. Data was collected from two individual courses instructed by two different faculty.

Data Analysis

A *t*-test was used to measure the scores of students on individual assignments and assessments taught by two instructors who the implemented and instructed the identical ICD-10-CM/PCS curriculum in the winter semester of 2015. A *t*-test was also used to compare teaching effectiveness based on the university's student evaluations of the teaching effectiveness of the two instructors. Teaching effectiveness was assessed in two ways: the progress on relevant objectives and overall ratings. The summary evaluation is the average of these two measures.

Results

A paired-samples *t*-test was conducted to compare the course results taught by two different instructors. Grades and assignments were collected from both instructors for comparison. A total of 32 students participated in this study: 16 from the Winter 2015 semester and 16 from the Winter 2016 semester. To have a paired-sample *t*-test, two student's scores from the highest and lowest of each assignment and assessment were removed from Instructor B's 2016 Winter semester course. After comparing the assignments, it was concluded that there was no statistical significance between the assignments. However, there was statistical significance between the assessments of the two semesters. Students who were in the Winter 2016 semester had a course pack that provided an outline and examples of each chapter that was covered.

A paired-sample *t*-test was also conducted to identify the effective teaching methods used to educate students in preparation of ICD-10 CM/PCS. Analysis revealed that all but one of the assignments was not statistically significant. The following variables Chapter 1, 2, 4, Exercise 3, Exercise 5, PCS Worksheets, and Michigan Health Information Management Association MHIMA) PCS revealed to be not statistically significant. The first assignment worksheet addressed a basic introduction to ICD-10 CM/PCS, a review of the material regarding code structure, the proper way to verify a code number, and the differences between ICD-10 CM/PCS and ICD-9-CM. The t-value was 15.00, and the p-value results were >0.0001, which made the difference to be statistically significant. Table 1 provides a summary of the comparison of assignments between the Winter of 2015 and Winter of 2016 teaching methods.

The second set of assessments covered a series of chapters from the ICD-10-CM and ICD-10-PCS Coding Handbook.[9] Students were quizzed on each chapter. Quizzes were worth 30 points. Instructor A had a mean of 3.50 and a standard deviation of 2.90. Instructor B had a mean of 29.88 and a standard deviation of 0.34. The t-value was 8.3543 and p-value results was >0.0001, which made the difference to be statistically significant. See Table 2 Comparison of Assessments Between Instructor A and Instructor B.

Discussion

The significance of the study relates to the teaching styles and the development of materials that were selected for the HIM course. Different teaching methods, such as lectures, textbook assignments, in-class procedure coding system (PCS) flashcard assignments, guest speakers, student-created coding scenarios, student journals, student organizational binders, research articles relating to ICD-10-CM/PCS, and additional exercises, were used for classroom instruction.

Students are required to keep a journal and create an organizational binder. The journal is meant for the students to write their thoughts about the course and identify how the course is going, what materials are they struggling with, and what information makes sense to them. The journal also serves as a teaching evaluation as the students do not always want to comment on the course or material directly to the instructor, and the information in the journal can allow the instructor to improve the course. The organizational binder is designed to create a tool that the students will use not only in the classroom but also in the practicum and in the profession of coding. The binder contains coding guidelines, examples, and notes taken during the course, and the students can continue to update and add pertinent information to it for years to come.

Limitations

No study is without limitations, and the following are noted by the authors: not meeting all student learning styles, teaching styles, student preparedness and the lack of training materials to instruct ICD-10-CM/PCS effectively. Teaching styles can become a limitation with regards to how students understand and learn the material. Not all teachers lecture and explain the course content the same way. If the instructor does not provide additional materials, the kinesthetic learner found it more difficult to learn and practice the skill of ICD-10-CM/PCS coding. This affected the scores of student's assignment and assessments in the course. Additionally, student preparedness for the content is a limitation when students are not prepared for the course. Students who do not retain the information before the coding class or review any previous material will struggle with ICD-10-CM/PCS. Preparation of foundation course work such as medical terminology is also a limitation. Students who completed a medical terminology course during high school, at a community college or as a transfer of credits will have a two to three-year gap between the medical terminology course

and ICD-10-CM/PCS. Finally, the study did not take into account differences in study habits, learning disabilities or a student's prior knowledge.

There is a lack of adequate training materials to properly educate students on the concepts of ICD-10-CM/PCS. Textbooks are available to teach the new coding system, but they lack ancillary materials to provide experiential learning of ICD-10-CM/PCS coding. This is a limitation of the study because if more resources and materials were made available for the instructor, effective teaching could take place and allow the instructor to provide supplemental material of all varieties of ICD-10-CM/PCS coding. The development of a course pack to provide supplemental material is needed to effectively teach ICD-10-CM/PCS.

Conclusion

The results of this quantitative study provided evidence that the course pack utilized by Instructor B was beneficial for studying for the quizzes and tests. Instructor A did not utilize the course pack. The *p*-values proved to be statistically different in the teaching effectiveness between the two instructors. The study showed that students preferred the real-life examples provided by Instructor B in the course pack to the short sentence descriptions within the textbook. We found that a great deal of time was spent creating the course pack content for each chapter and not enough time was devoted to creating additional worksheets. Some chapters may have had a worksheet, but the instructors did not have enough time to create one for each chapter.

Furthermore, the findings of this study can be used to educate coding educators across the country. The AHIMA Faculty Development Institute/Assembly on Education offers an annual conference for educators. The findings of this study could help health information technology and HIM educators identify best practices for effective teaching of ICD-10-CM/PCS. Moreover, identifying different types of learning styles will help teachers to better engage students in learning the material related to the change to ICD-10-CM/PCS. Providing students with additional resources to understand ICD-10 CM/PCS coding guidelines and know how to apply them correctly can potentially make the students more marketable for future employment.

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Notes

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