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ORIGINAL ARTICLE

Influence of an educational review sheet on chiropractic students' evaluation and management coding performance: *A randomized trial*

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Objective: To evaluate whether an educational worksheet would influence the accuracy of simulated evaluation and management (E/M) coding among students in a doctor of chiropractic program.
Methods: An educational worksheet was developed as well as a test and survey involving simulated patient scenarios. Two groups were analyzed in this project. All members of the intervention group received the educational worksheet and were able to use it while completing their E/M coding test and survey; the control group completed their E/M coding test and survey without the educational worksheet. The E/M coding test and survey were scored for each group; the mean group scores were evaluated, and between group differences were analyzed using a 2-tailed t test.
Results: The intervention group recorded significantly higher scores ($p < .001$) on the E/M coding test and survey.
Conclusion: Doctor of chiropractic students who were provided with an E/M educational worksheet had fewer errors on a simulated E/M coding test and survey.

Key Indexing Terms: Chiropractic; Clinical Coding; Education; Medicare

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INTRODUCTION

Evaluation and management (E/M) servicing codes are an integral part of billing for the chiropractic physician as well as all health care providers in the United States. These codes were developed by both the American Medical Association and the Centers for Medicare and Medicaid Services (CMS). E/M codes serve as a guide for the health care provider to record initial examination and follow-up examination level of care for the office visit. Criteria are used to record the history and physical exam findings to elucidate a correct diagnosis and to document the complexity of medical decision making needed for the encounter. Outside the United States, the topics discussed in this article can assist health care providers in the architectural framework of patient assessment.

Once a health care provider has a diagnosis or diagnoses, he or she can implement the proper treatment.[1] Accurate documentation also enables medical records that facilitate communication between providers and monitoring patients' health over time and that facilitate collecting valuable data that may be used for research purposes.[2] With a better understanding of documentation requirements, the current or future provider can have the proper components of the E/M codes and better meet their contracted obligations with insurance companies.[2] Health care providers are under pressure from insurance companies for failing to meet the documentation requirements for the various levels of E/M coding, and in a 2012 report from the Office of the Inspector General, it was shown that 42% of all E/M coding was billed incorrectly across all physician specialties.[3]

We developed an educational coding worksheet for students that detailed criteria for different levels of E/M coding. The 1997 CMS Evaluation and Management Services Guides that have been in place since 2013 were used as the basis of the worksheet. We then tested the students using 2 case vignettes to assess their ability to accurately determine which E/M codes applied to each of the questions. The authors hypothesized that there would be fewer coding errors among students using of the E/M worksheet while completing a test and survey.

METHODS

Operational Definitions

For reference, there are 5 E/M codes for initial evaluation and 5 for reevaluations numbered 99201–99205 and 99211–99215, respectively. Each code must

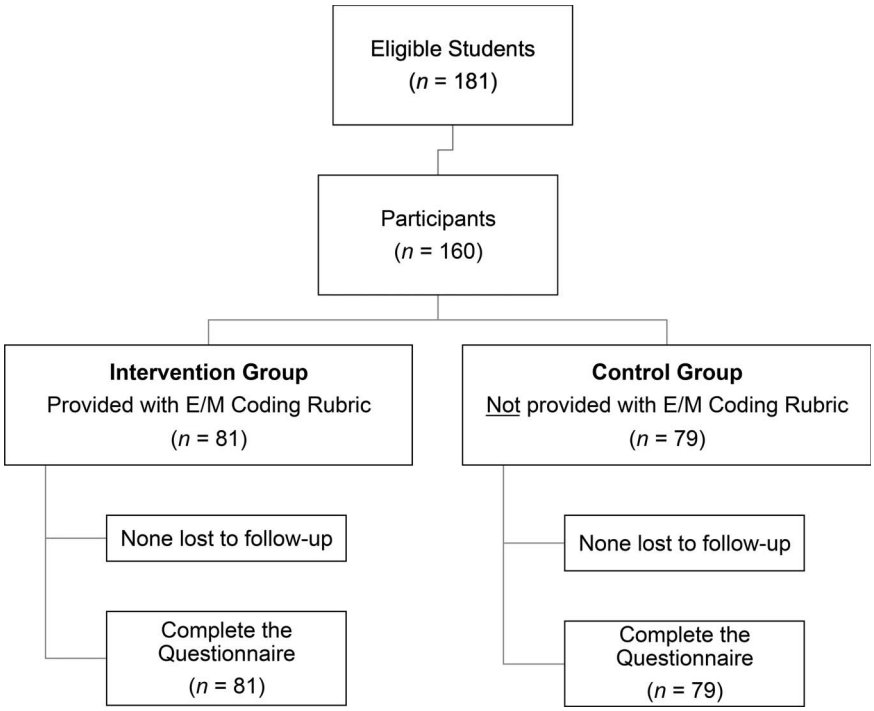

Figure 1 - Study flowchart.

meet certain criteria to be considered for reimbursement. For example, a 99201 E/M code is the most straightforward and/or the shortest timed code. A 99201 is an office or other outpatient visit for the evaluation and management of a new patient, which requires 3 components: focused history, problem-focused exam, and straightforward medical decision making.[4] A 99205 is the most complex and time consuming, consisting of office or other outpatient visit for the evaluation and management of a new patient, which requires 3 components: comprehensive history, comprehensive exam, and medical decision making of high complexity. There are additional codes with varying amounts of difficulty for the clinician. Each of these codes must meet certain criteria according to the CMS. When determining the proper codes for new encounters, the section of the lowest complexity is the section that determines the complete code; if this is not done, it is considered to be overcoding.[4]

Participants

The study participants were a sample of students enrolled in a doctor of chiropractic program at Palmer College of Chiropractic, Florida. Inclusion criteria consisted of being enrolled in the Clinic Patient Management I, II, or III course during the spring 2015 quarter, present on the day the survey was administered, and agreeing to the informed consent. This sample of students was chosen, as they all had training in the E/M coding of patient exams and, at the minimum, an introduction to billing and coding class. All students were invited to participate in this study, but participation was optional; therefore, this survey involved a convenience sample of willing students.

Participants consented to participate in the study via an in-person description of the study, followed by an informed consent. Informed consent emphasized the rewards of participating, which were limited to extra practice performing E/M coding, and the costs of participating, which involved taking approximately 10 minutes to complete the test and survey. There were no direct rewards for students who decided to participate, nor were there any punishments for declining to participate. Ethics approval was granted by the Palmer College of Chiropractic Institutional Review Board (reference number X2014-12-18-C).

Study Design

This was a randomized trial with an educational intervention group and a control group. Participants were assigned to a group using computer randomization. Half of the study participants were randomized to the intervention group, and the other half were randomized to the control group. The study flow is presented in Figure 1. The intervention group received an E/M coding worksheet and an E/M coding test and survey. The control group received only the E/M coding test and survey.

Intervention

We created a 2-page educational worksheet titled the Evaluation and Management Coding Worksheet (Supplementary Online Appendix A, available at http://www.journalchiroed.com) using the available 1997 CMS E/M coding guidelines. This worksheet was created with the intention that it would serve as a simple tool to assist students when making E/M coding determinations. The E/M Coding Worksheet was structured in the order of

history, exam, and medical decision making, working down the page to the finality of an initial exam or reexam section. The worksheet was fit to a standard 8.5- by 11-inch piece of paper. All of the information from the CMS Guidelines used was included in this 1 form, which did affect font size and ease of readability in some cases. The items on the worksheet were adapted from the 1997 musculoskeletal specialty criteria. Faculty clinicians at the Palmer College of Chiropractic Florida campus and the Davenport, Iowa, campus reviewed this 2-page educational worksheet.

Outcomes

Following the development of the E/M worksheet, the authors developed a test and survey questionnaire (Supplementary Online Appendix B, available at http://www.journalchiroed.com) based on commonly seen errors by the authors by their students. The test and survey, based on 2 case vignettes, was developed out of common errors that the authors (all faculty members) have seen in coding. The test was designed to assess students' ability to accurately determine which E/M codes applied to each of the questions. The test and survey contained 12 questions regarding accurate E/M coding within a chiropractic setting and also collected basic demographic information.

Blinding and Administration

A research assistant administered the test and survey in nonidentifiable opaque envelopes. The research assistant would identify the students in the control group by matriculation number, and those students received the envelope with the E/M coding test and survey, while the students in the intervention group received the E/M coding worksheet and coding test and survey. The E/M coding test and survey was an anonymous in-person test done on paper and was collected by the research assistant. The research assistant deidentified and entered the responses into a Microsoft Excel (Microsoft Corp, Redmond, WA) and provided the statistician with the numerical data so that statistical analysis could be performed. When scoring the students' responses, a single point was awarded for correct E/M coding responses, and no points were awarded for incorrect or blank responses. A total score was recorded for each returned test and survey and used for the statistical analysis. The authors were blinded as to which of the 2 groups the study participants were randomized.

Statistical Analysis

Statistical analysis was performed after the surveys were completed, and all responses were and scored and entered into a spreadsheet. Group means and standard deviations were calculated for the E/M coding test and survey scores, and an independent *t* test was used to evaluate differences in scores between groups. Between-group differences for all categorical baseline data were analyzed using chi-square to detect any differences in categorical variables between groups. We evaluated all assumptions for the 2-sample *t* test prior to using this statistical method. Using box-and-whisker plots, we visualized the data to evaluate whether the dependent variable was approximately distributed in a normal manner and to assess for the presence of any outliers. The data approximated a normal distribution, and there were no outliers. Statistical significance for all tests was set to $\alpha \leq 0.05$, and the null hypothesis assumed no difference between the 2 study groups. All statistical analyses were conducted using the Statistical Package for the Social Sciences version 20 (IBM Corp, Armonk, NY).

Table 1 - Baseline Characteristics of the Study Sample

	Control Group	Intervention Group	*p* Value
Gender			.62
Male	42 (26.6%)	43 (27.2%)	
Female	36 (22.8%)	37 (23.4%)	
Preferred not to answer	0 (0%)	1 (0.6%)	
Age			.03
18–29 y	72 (45.8%)	61 (38.4%)	
30–49 y	6 (3.7%)	17 (10.7%)	
50–64 y	0 (0%)	2 (1.3%)	
≥65 y	0 (0%)	0 (0%)	
Preferred not to answer	0 (0%)	1 (0.6%)	
Education			.42
Bachelor's degree	73 (45.9%)	70 (44.0%)	
Master's degree	4 (2.5%)	7 (4.4%)	
Doctoral degree	1 (0.6%)	3 (1.9%)	
Preferred not to answer	0 (0%)	1 (0.6%)	
Quarter			.22
10th	39 (24.5%)	39 (24.5%)	
11th	23 (14.5%)	32 (20.1%)	
12th	16 (10.0%)	9 (5.7%)	
13th	0 (0%)	0 (0%)	
Preferred not to answer	0 (0%)	1 (0.6%)	
E/M worksheet provided?			<.001
Yes	1 (0.6%)	78 (49.1%)	
No	77 (48.4%)	2 (1.3%)	
Preferred not to answer	0 (0%)	1 (0.6%)	
Did you use the E/M worksheet?			<.001
Yes	1 (0.6%)	42 (26.4%)	
No	77 (48.4%)	38 (23.9%)	
Preferred not to answer	0 (0%)	1 (0.6%)	

p *values reported are for chi-square tests.*

RESULTS

There were 181 students eligible to participate in the study, including 85 from Clinical Practice Management I, 60 from Clinical Practice Management II, and 36 from Clinical Practice Management III. One hundred sixty-one students (88.4%) consented to participate, completed, and returned their test and survey.

Table 1 provides a detailed overview of the baseline characteristics of the 2 study groups. Most of the between-group comparisons were not statistically different. A significant difference was recorded between the 2 groups for age, even though the groups were randomly generated. There was a significant difference between the 2 groups regarding whether the E/M worksheet was provided ($p <$

Table 2 - Evaluation and Management Test and Survey Results

	Control Group	Intervention Group
Mean score (SD)	6.10 (1.66)	7.61 (2.48)
Test statistic	4.50	
Degrees of freedom	141.45	
95% confidence interval	(0.84, 2.16)	
p value	<.01	

*SD = standard deviation; *≤.05 on an independent 2-sample* t *test.*

.001) and whether students in the intervention group used the E/M Worksheet ($p < .001$).

Table 2 provides an overview of the E/M Coding test and survey scores for the 2 study groups. There was a significant difference between the mean scores of students in the intervention group and the control group. The mean score of the intervention group was higher than that of the control group, meaning that fewer E/M coding errors were made by the students in the intervention group.

DISCUSSION

A complete understanding of E/M coding can be challenging for students early in their clinical education, and the criteria for determining the appropriate levels are expansive. The combination of highly detailed and specific E/M coding criteria and a general dislike of documentation requirements combine to become an obstacle for E/M coding accuracy. It appears that the worksheet provided led to decreased coding errors and increased compliance. This has been shown to be the case with other providers and disciplines, with improvement in charting bringing errors down by as much as 20%.[5] The results obtained in the present study may transfer to benefits for these chiropractic students in practice, as the knowledge gained may assist in charting proper billing and receiving reimbursement with a decreased chance of audit. Fully understanding what constitutes each code may take time for students to learn.

Documentation requirements and record-keeping topics may be unappealing, which is why an evaluation and management coding educational worksheet may help with the reduction of erroneous coding and the risk of future audits. It is well documented that with the help of a template or aid, the amount of errors when charting decreases.[5–9] The use of the E/M coding form that was developed and implemented here showed significant differences in proper coding compared to students who did not use this worksheet. This easy-to-use 1-page worksheet can be used to determine bullet points, count them, and then turn the page over and choose the appropriate code. The continued use of this tool may allow students to effectively and correctly code their patients' exams. The use of the form can also be carried forward by students into practice. Coding also is a subject that some practicing doctors struggle with, and a tool such as this may help them sharpen their coding skills.

Limitations

The E/M coding test and survey used for this project has not been validated, and generalizations from this project are limited. It is also plausible that the students with the worksheet could have possibly shared with students who did not have the worksheet, skewing the results. Both the E/M worksheet and the test and survey were validated by peers at both the Palmer Florida campus and the Palmer Davenport campus but not by a committee or review group. The E/M worksheet and test and survey were not pretested or piloted before use. This was an error in the initial development of the project and part of the authors' inexperience with this type of original research. The development of the test and survey most likely had some bias based on the anecdotal errors the authors were trying to correct. Future studies should have validated surveys. Additionally, a difference was detected in the baseline age of the 2 study groups. The control group was significantly younger age than the intervention group, even though computer randomization was used to create the 2 study groups. What impact this age difference may have had on the results of this study is unknown.

CONCLUSION

Doctor of chiropractic students who were provided with an evaluation and management educational worksheet had fewer errors on a simulated E/M coding test and survey. It appears that in this particular case, a coding worksheet aided in decreasing errors in coding.

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No funding was provided to perform this project, and the authors declare that there are no conflicts of interest.

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