The Perceived Knowledge of Health Informatics Competencies by Health Information Management Professionals

by Brooke Palkie, EdD, RHIA

Abstract

The 2009 enactment of the Health Information Technology for Economic and Clinical Health (HITECH) Act has placed unprecedented emphasis on utilizing technology to improve the quality of care and to decrease healthcare costs. To meet these goals, the healthcare field will need an increase in the number of professionals with the appropriate health informatics training and data analysis skills. Therefore, the author investigated the perceived knowledge of the emerging health informatics competencies by health information management (HIM) professionals. Expectations of analytical and health information technology skills have set the stage for HIM professionals to exert leadership in terms of health informatics.

Keywords: health information management, health informatics, health information technology

Introduction

The health information management (HIM) discipline was initiated to fulfill the need for skillful management of clinical data. Over time, HIM has been influenced by the social, economic, political, and specialized advances of technology in healthcare, evolving from just the use of technology to the demand for the use of validated data and information.[1] To meet these demands, HIM professionals are now expected to provide multifocused and decentralized services. The roles and responsibilities of HIM professionals must expand to meet the industry's reliance on health information technology (HIT) and health informatics within the evolution of a new information science era.[2]

In an age that is swiftly transitioning to value-based payment and care delivery, hospitals need timely and accurate health information to support decision making.[3] However, a perceived gap exists between the current state of the HIM profession and the exposure to emerging informatics competencies needed within the healthcare industry. This shortage of qualified professionals has been identified by several national surveys and publications further identifying a lack of understanding of the current healthcare data and information needs.[4–6]

Background

The 2009 enactment of the Health Information Technology for Economic and Clinical Health (HITECH) Act has placed unprecedented emphasis on utilizing technology to improve health information in the areas of quality, delivery, and efficiency.[7] These political and economic drivers are generating a new incentive to increase investment in clinical information systems. Measuring the value of HIT has previously been recognized as challenging by government, healthcare organizations, consumers, and

payers alike.[8] However, according to a HIMSS Analytics study, *EMR Sophistication Correlates to Hospital Quality Data*,[9] evidence now supports that sophisticated electronic heath records (EHRs) can positively correlate to improved measures of patient outcomes. A study conducted by the Institute of Medicine[10] indicates that HIT has also demonstrated the potential to improve patient safety. For these reasons, the HIM professional must remain adaptable in order to stay current with the new HIT market demands.

Innovative advances in HIT and the government's push to employ individuals in the health informatics field have also contributed to a competitive environment. However, many healthcare organizations are still not utilizing data to their fullest potential. This situation is due to the limited knowledge of health informatics as well as a shortage of HIM professionals with the deep analytical skills needed to make effective decisions.[11] A report by the McKinsey Global Institute[12] predicts that the United States alone will face a shortage of 140,000 to 190,000 people with deep analytic skills by the year 2018. The continued use of HIT is the impetus for understanding the emerging roles of health informatics for HIM professionals. According to Smith et al.,[13] little is known about the health informatics workforce. However, the health informatics workforce requires a significant expansion to support the recent national e-health agendas.[14] To meet these needs, HIM professionals must be able to identify and strengthen their roles related to HIT.[15]

As the volume and use of data increase, clinical informatics continues to become a major contributing factor in healthcare. This study aimed to identify HIM professionals' perceived knowledge of the emerging health informatics competencies.

Methods

The research involved the completion of a survey using the Qualtrics web-based survey software. A total of 39,578 HIM members of the American Health Information Management Association (AHIMA) received an invitation to participate in the survey via the AHIMA weekly E-Alert newsletter; 131 HIM professionals opted to begin the survey. If less than half of the survey was completed, the response was omitted from the analysis. Of the participants who started the survey, 100 participants completed half of the survey or more. Participation included acceptance of the consent form and completion of the survey. Although this study yielded a small sample size, participant responses can still be utilized to represent a sample of HIM professionals' perceived knowledge of health informatics competencies. Since analysis of variance (ANOVA) was used with a sample size of 100, the effect size was 0.3 for all statistical results. Table 1 shows a reasonable amount of evidence to suggest that the observed significant differences are meaningful.

The survey consisted of four sets of demographic questions that included (1) length of time in the HIM field, (2) highest degree earned, (3) primary work setting, and (4) use of information technology. Additionally, the survey consisted of health informatics questions that identified degrees of competency on the basis of a Likert scale as follows: 1, No Knowledge; 2, Entry Level (Beginner/Novice); 3, Competent (Intermediate); 4, Proficient (Skilled); and 5, Expert (Reliable Source of Skills).[16] The findings from the study *Pointing the Way: Competencies and Curricula in Health Informatics*[17] have been recognized as a consistent base to identify categories of health informatics competencies.[18–22] Each category further incorporated industry roles and competencies in health informatics identified in recent publications and recommendations by the Commission on Accreditation for Health Informatics and Information Management Education[23] (see Appendix A). This model was utilized to serve as the framework for the health informatics competency environment and included (1) clinical informatics foundational competencies, (2) clinical decision-making and process improvement competencies, (3) health information system competencies, and (4) leadership and management competencies.

Results

Of the 131 participants who started the survey, 100 participants completed half of the survey or more. These 100 participants were included in the data analysis. The results include the identification of

significant differences ($p < .05$). The results of a one-way ANOVA revealed a main effect with the health informatics competencies of information literacy ($F = 4.068$, $p = 0.0021$), characteristics and functions of information systems in healthcare ($F = 2.327$; $p < 0.0489$), policy and regulatory frameworks for health information ($F = 2.688$; $p < 0.0259$), and human resource management ($F = 3.476$; $p < 0.0064$) when comparing years of experience. For example, as shown in Table 2 and revealed by the Tukey post hoc test, respondents with 15–20 years of experience had significantly greater perceived knowledge compared to respondents with 1–3 years of experience ($p < 0.005$), and respondents with more than 20 years of experience had significantly greater perceived knowledge compared to respondents with 1–3 years of experience ($p < 0.001$).

When respondents were compared on the basis of the highest degree earned, the results of a one-way ANOVA also revealed a main effect with the health informatics competencies of structure, design, and analysis principles of health records ($F = 3.594$; $p < 0.0165$), ethical and security issues ($F = 4.622$; $p < 0.00525$), policy and regulatory frameworks of healthcare information ($F = 5.874$; $p < 0.00101$), clinical guidelines ($F = 3.027$; $p < 0.0334$), methods of workflow analysis ($F = 3.926$; $p < 0.0109$), principles of workflow reengineering ($F = 4.032$; $p < 0.00958$), quality improvement principles and practices ($F = 3.372$; $p < 0.0217$), speech recognition ($F = 4.202$; $p < 0.0179$), dealing with multiple identifiers ($F = 3.231$; $p < 0.0259$), institutional governance of clinical information systems ($F = 3.104$; $p < 0.0303$), clinical information needs analysis and system selection ($F = 2.867$; $p < 0.0408$), human resource management ($F = 6.23$; $p < 0.000667$), group management process ($F = 5.744$; $p < 0.00119$), effective communication ($F = 3.077$; $p < 0.0313$), strategic and financial planning for clinical information systems ($F = 3.206$; $p < 0.0267$), and change management ($F = 4.495$; $p < 0.00541$). The Tukey post hoc test further revealed that respondents with a master's degree had a greater perceived knowledge than those with a bachelor's degree ($p < 0.014$).

The results of a one-way ANOVA also revealed a main effect with the health informatics competencies of evidence sources ($F = 3.207$; $p < 0.0103$), data standards and data sharing ($F = 3.209$; $p < 0.0102$), messaging standards ($F = 2.789$; $p < 0.0217$), ontologies and taxonomies ($F = 3.784$; $p < 0.00367$), interoperability standards ($F = 2.54$; $p < 0.0337$), and group management process ($F = 2.414$; $p < 0.0419$) when respondents were compared on the basis of their primary work setting. Here the Tukey post hoc test revealed that respondents who work in a hospital setting had perceived less knowledge than those working in other settings ($p < 0.025$).

Finally, the results of a one-way ANOVA revealed a main effect of the health informatics competencies of topologies ($F = 4.641$; $p < 0.000383$); telecommunications ($F = 3.557$; $p < 0.00329$); models, theories, and practice of human-computer interaction ($F = 3.054$; $p < 0.00914$); and usability ($F = 2.523$; $p < 0.0264$) when respondents were compared on the basis of their use of information technology. The Tukey post hoc test further revealed that respondents who both use and deploy HIT have a greater perceived knowledge than those who just use HIT ($p < 0.041$) and those who just deploy HIT ($p < 0.020$).

Discussion

The perception of HIM knowledge was captured to determine if HIM professionals are proficient in the health informatics competencies currently needed in the workforce. The research demonstrates a significant association between HIM demographics and health informatics competencies. These associations can be utilized to identify where HIM professionals need further training.

Of the identified categories, the strongest predictor of HIM competency tended to be education. Respondents with a master's degree tended to have greater knowledge of topics such as analytics than those with a bachelor's or associate's degree. According to Cassidy et al.,[24] if HIM graduates are to achieve the status that will define the future of healthcare, the HIM profession must shift its entry-level degree to a master's degree. This initiative focuses on faculty and workforce development and supports the association between possession of a master's degree and higher levels of competency knowledge.

The category of greater years of experience was also associated with greater knowledge in various HIM categories. However, respondents with more years of experience had less knowledge of social networks than those with fewer years of experience.

When reviewing the results of the primary work setting variable, the author expected that the hospital setting would be associated with greater knowledge of the health informatics competencies. However, the results identify that educational and other settings were associated with greater perceived knowledge than the hospital setting was.

HIT use was identified as another predictor of perceived HIM knowledge. The respondents who deployed and used HIT had greater knowledge in various categories than those who just used or just deployed HIT. For many years, HIM professionals have remained closely tied to the skill sets of information management. As the walls of the HIM departments in healthcare organizations come down and HIM professionals disperse throughout the healthcare industry, their roles and responsibilities will need to expand to meet the industry's reliance on HIT.[25]

Conclusion

Education is the next step in the process of increasing HIM professionals' health informatics competencies. Educational programs must take into account the current environment in which HIM professionals will work. Additional studies of the necessary competencies should be conducted, and state and national associations should provide a roadmap of expected health informatics competencies for HIM professionals.

The results of this study imply associations between HIM professionals' demographics and perceived health informatics competencies. These implications are consistent with studies that identified the current health informatics competencies of HIM professionals.[26–28] It is important to note that the competencies needing the most attention are those that revolve around HIT. Although HIM professionals already possess foundational skills for health informatics, additional growth in HIT competencies and deep analytical skills will be required. HIM professionals and educators alike will need to be at the forefront of this new information science era.

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Notes

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Appendix A

Updates to Health Informatics Competencies

Title	**Source**	**Access Date**
"AMIA Board White Paper: Definition of Biomedical Informatics and Specification of Core Competencies for Graduate Education in the Discipline."	Kulikowski, Casimir A., Edward H. Shortliffe, Leanne M. Currie, Peter L. Elkin, Lawrence E. Hunter, Todd R. Johnson, Ira J. Kalet, Leslie A. Lenert, Mark A. Musen, Judy G. Ozbolt, Jack W. Smith, Peter Z. Tarczy-Hornoch, and Jeffrey J. Williamson. *Journal of the American Medical Informatics Association* 19, no. 6 (2012): 931–38. doi:10.1136/amiajnl-2010-001053	March 3, 2013
"A Curricula-based Comparison of Biomedical and Health Informatics Programs in the USA."	Kampov-Polevoi, Julia, and Bradley M. Hemminger. *Journal of the American Medical Informatics Association* 18 (2011): 195–202. doi:10.1136/jamia/2010.004259	March 3, 2013
"Building Health Informatics Skills for Health Professionals: Results from the Australian Health Informatics Skill Needs Survey."	Garde, Sebastian, David Harrison, Mohammed Huque, and Evelyn J. S. Hovenga. *Australian Health Review* 30, no. 1 (2006): 34–45.	March 3, 2013
"Training the Next Generation of Informaticians: The Impact of 'BISTI' and Bioinformatics. A Report from the American College of Medical Informatics."	Friedman, Charles P., Russ B. Altman, Isaac S. Kohane, Kathleen A. McCormick, Perry L. Miller, Judy G. Ozbolt, Edward H. Shortliffe, Gary D. Stormo, Cleat Szczepaniak, David Tuck, and Jeffrey Williamson. *Journal of the American Medical Informatics Association* 11, no. 3 (2004): 167–72.	March 1, 2013
"Recommendations of the International Medical Informatics Association (IMIA) on Education in Biomedical and Health Informatics: First Revision."	Mantas, John, Elske Ammenwerth, George Demiris, Arie Hasman, Reinhold Haux, William Hersh, Evelyn Hovenga, K. C. Lun, Heimar Marin, Fernando Martin-Sanchez, and Graham Wright. *EJBI* 7, no. 2 (2011). Available at http://www.ejbi.org/img/ejbi/2011/2/Mantas_en.pdf.	March 1, 2013

"Core Content for the Subspecialty of Clinical Informatics."	Gardner, Reed M., J. Marc Overhage, Elaine B. Steen, Benson S. Munger, John H. Holmes, Jeffrey J. Williamson, and Don E. Detmer. *Journal of the American Medical Informatics Association* 16, no. 2 (2009). Available at http://www.amia.org/sites/amia.org/files/AMIA-Clinical-Informatics-Core-Content.pdf.	March 1, 2013
"The Development of a Model Curriculum for Applied Health Informatics."	MacNeill, Janice E., and H. Dominick Covvey. *Proceedings of the AMIA Symposium* (2000): 527–31. Available at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2243833/.	March 1, 2013
Joint Work Force Task Force: Health Information Management and Informatics Core Competencies for Individuals Working with Electronic Health Records.	American Health Information Management Association (AHIMA) and American Medical Informatics Association (AMIA). Chicago, IL: AMIA, October 2008. Available at http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_040723.pdf.	March 1, 2013

Table 1

Effect Size Table

ANOVA *F* tests	Repeated measures, between factors
Analysis	Sensitivity: Compute required effect size
Input values	
α error probability	0.05
Power (1 − β error probability)	0.95
Total sample size	100
Number of groups	5
Number of measurements	4
Correlation among repeated measures	0.5
Output values	
Noncentrality parameter λ	19.52
Critical *F*	2.47
Numerator df	4.00
Denominator df	95.00
Effect size f	0.35

Table 2

Data Analysis Table for Key Informatics Concepts, Models, and Theories
Question 31 (Q31): Information Literacy (Classification and Systematic Health-related Terminologies and Their Coding)

	Df	**Sum Square**	**Mean Square**	***F* value**	**Pr(>*F*)**
Q31	5	17.46	3.491	4.068	0.00221**
Residuals	92	78.95	0.858		

Comparison of Respondents by Years of Experience	**Difference**	**Lower Value**	**Upper Value**	***P*-value (Adjusted)**
7–9 years − 1–3 years	0.723	−0.499	1.945	0.521
4–6 years − 1–3 years	0.938	−0.230	2.105	0.190
10–15 years − 1–3 years	1.021	−0.009	2.051	0.053
More than 20 years −1–3 years	1.128	0.336	1.920	0.001**
15–20 years − 1–3 years	1.284	0.277	2.290	0.005**
4–6 years − 7–9 years	0.214	−1.181	1.610	0.998
10–15 years − 7–9 years	0.298	−0.985	1.580	0.984
More than 20 years − 7–9 years	0.405	−0.696	1.506	0.892
15–20 years − 7–9 years	0.560	−0.704	1.825	0.789
10–15 years − 4–6 years	0.083	−1.147	1.314	1.000
More than 20 years − 4–6 years	0.190	−0.850	1.231	0.995
15–20 years − 4–6 years	0.346	−0.865	1.558	0.961
More than 20 years − 10–15 years	0.107	−0.775	0.990	0.999
15–20 years − 10–15 years	0.263	−0.817	1.342	0.980
15–20 years – more than 20 years	0.156	−0.700	1.011	0.995

**Significant difference ($p < .05$)