Exploring health economics course competencies' value for nurse administrators

Maia Platt, PhD[a,*], Andrea Kwasky, DNP, MSN, RN, PMHNP-BC[b],
Douglas A. MacDonald, PhD[c], Joanne Spetz, PhD[d,e,f]

[a]College of Health Professions, University of Detroit Mercy, Detroit, MI
[b]McAuley School of Nursing, University of Detroit Mercy, Detroit, MI
[c]College of Liberal Arts and Education, University of Detroit Mercy, Detroit, MI
[d]Philip R. Lee Institute for Health Policy Studies, University of California San Francisco, San Francisco, CA
[e]Department of Family and Community Medicine, School of Medicine, University of California San Francisco, San Francisco, CA
[f]Department of Social and Behavioral Sciences, School of Nursing, University of California San Francisco, San Francisco, CA

ABSTRACT

Background: A survey of nursing administrators in the United States was conducted to solicit opinions about health economics (HE) course competencies for baccalaureate nursing programs.
Purpose: To provide rationale for intensifying educational efforts to increase nurses' awareness about the value of HE skills in their everyday work.
Methods: Participants were asked to rate six HE competencies using a Likert scale. Paired-samples *t* tests, bivariate correlations, and standard multiple linear regressions were used to analyze survey results.
Discussion: A strong direct relationship exists between the amount of prior knowledge nursing administrators have about HE and the perceived level of usefulness of HE skills.
Conclusion: Nurses' contributions to creating value in healthcare must be encouraged. Increasing the share and accessibility of the HE content in continuing education offerings could be one way to expand HE knowledge among practicing nurses and promote cost-effective delivery of healthcare in the United States.

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Introduction

Several years ago, one of the authors was assigned to teach a health economics (HE) course for baccalaureate nursing students who already held a Registered Nurse license (RN-BSN program). It was a mandatory course in the Bachelor of Science in Nursing (BSN) completion curriculum. Upon entering the BSN completion program, nearly all students already had experience working in a clinical environment, and most had been employed for a number of years. During the first class, the majority of students would actively complain about the prospect of spending their valuable time, money, and effort studying concepts of "no value" to them. However, by the end of a typical

course, their perception of the value of HE would undergo a complete reversal, with many students openly sharing how surprising and unanticipated this change was for them. Throughout the course, students would readily bring a wealth of clinical experience into the classroom, which created a highly interactive and practice-oriented learning environment where every HE concept was immediately tested by students for possible application at their workplace. It was apparent that there was a direct relationship between the amount of knowledge the students had about the subject of HE and their perception of the usefulness of HE knowledge and skills for their professional life. At minimal levels of exposure to HE, average perception of its value tended to be relatively low and, after completing a required HE course, average perception of its value tended to be relatively high. Although this project originated from observations in a RN-BSN cohort, the authors could see its translation to all levels of nursing education. That observation motivated the research presented in this article.

Background and Literature Review

This paper reports results from the third project in a body of research aimed at assessing the value and benefits of HE education and HE practical skills for the nursing profession. This paper builds on two earlier publications; Platt and Kwasky (2012) focused on the potential for HE education and skills to have high value for the nursing profession, as well as for society as a whole. Nurses equipped with HE skills can make more cost-effective decisions in their workplace. On a larger scale, this would facilitate societal benefits such as optimizing the use of limited resources in the healthcare sector, slowing the rate of healthcare expenditure growth, and promoting delivery of high-value care at a lower cost (Platt, Kwasky, & Spetz, 2016).

Another important component of the previous two projects was documentation of the current state of HE education in undergraduate nursing programs in the United States and development of didactic tools and policy proposals to change the status quo. Platt and Kwasky (2012) analyzed publicly-available curricula of all accredited BSN programs in the United States and found that HE courses (as a separate course or as a course which at least included HE in its name, e.g., Health Economics and Finance) were present in the curricula of less than 4% of the BSN programs. To address this low level of exposure to HE knowledge, a change in the Commission of Collegiate Nursing Education accreditation standards was suggested: to make a HE course or the deliberate threading of HE competencies throughout the curriculum a mandatory part of BSN curricula in the United States.

While a change in educational standards would be an important step toward increasing awareness of the value of HE skills within the nursing profession, it cannot be sufficient, as it would affect only future generations of nurses. Working with the current nursing workforce, including nursing administrators, is of importance as well. Thus, collecting evidence about how much value nursing administrators currently place on the HE skills of their nursing employees was the next step in this research.

In the first phase of research on the value of HE in the nursing workplace, we identified a unique set of HE competencies relevant specifically for BSN students and developed a formal psychometric tool. The multi-stage process undertaken for this work was documented in Platt et al. (2016), and Appendix A features the outcome of that work: six HE course competencies for BSN programs, where each competency is complemented with several examples of practical activities/skills bedside nurses could perform in their everyday work.

The second step in the research agenda involved a survey of nursing administrators in the United States to solicit their opinions about the usefulness of HE competencies and skills for their nursing employees. A summary of the survey results was published in Platt et al. (2016), where (a) high (ranging between 67.8% and 92.0%) approval rates of all the six competencies and practical skills associated with them were reported, and (b) overall validity of the proposed educational tool was established.

The goal of this third phase of the project was to undertake a detailed analysis of the data from the same survey to identify additional educational insights important for BSN curricula. In particular, the aims of the research were to determine (a) which competencies were rated significantly higher or lower compared to other competencies and (b) what organizational, demographic, and/or attitudinal characteristics are associated with significant differences in the rating of competencies. The null hypothesis was that organizational and demographic characteristics have little impact on the nursing administrators' perceptions of HE competencies' usefulness, and thus other factors, possibly related to existence of respondents' presurvey opinions and/or preferences about the value of HE knowledge in general, play a larger role. The rationale behind the hypothesis is based on the empirical classroom observations described in the introductory part of this paper.

Thus, the main contribution of this research is identification of (a) the HE competencies that are currently perceived by nurses as more useful compared to other competencies, as well as which ones may be perceived as less useful and thus need to be brought to the attention of the nursing profession to improve their overall HE proficiency; and (b) organizational, demographic, and/or attitudinal characteristics that are linked to higher versus lower perception of specific HE competencies' usefulness. The results have important policy implications regarding the development of appropriate educational strategies to amplify nurses' HE skills as well as the value of HE skills in their profession.

Methods

Data Sample

Data for this study come from a nationwide survey of the nursing administrators in the United States. Survey content was developed and administered in 2014 with partial results reported in Platt et al. (2016). Details of how the survey instrument was designed are described in the next section. To facilitate data collection, the fifty US states were divided into eight economic regions in accordance with the Bureau of Economic Analysis (BEA)'s classification (Bureau of Economic Analysis, n.d.). A professional organization of nursing administrators in the most populous state in each region was approached first with the request to administer the survey to its members via email. If administration of the survey in any of such states was not feasible (reasons included no response or negative response), a professional organization of nursing administrators in the next most populous state in the same region was approached next. The goal was to administer the survey in the total of eight states, with each state being representative of its economic region, and ultimately all eight states being representative of the entire country. Within three of the economic regions, however—New England, Southwest, and Rocky Mountain—administration of the survey was not feasible in any of the states, thus reducing the pool of survey participants to five states representing the regions of Mideast, Great Lakes, Plains, Southeast, and Far West.

The 20-item survey was sent electronically to the combined total membership of 3,133 nursing administrators in those five states. The response rate was 10.41%. Of 326 complete responses, 23 responses were eliminated due to missing data, where participants selected the option "Do not have enough information/ Not familiar with economic terminology" at least once, reducing the final sample size to 303.

Design of a Survey Instrument

Murray's (1999) detailed step-by-step guidelines for developing scientific questionnaires were followed when designing the survey instrument for this project. The survey in its entirety can be found in Appendix A. It features two parts. Part 1 is unique to this study, where the list of six HE course competencies, along with their associated practical activities, served as the foundation for survey questions. The first six questions ask participants to evaluate usefulness of the proposed competencies in their workplace using a Likert scale: very useful, useful, limited use, not useful at all. A customized field "don't have enough information/not familiar with economic terminology" was also included to allow the participants to indicate this specific reason for not providing a response. Space was provided for participants to make suggestions or formulate their own competencies in the open-ended question 7.

Thirteen questions in part 2 of the survey request information about participants and their employer. Demographic characteristics include both organizational (e.g., employment setting; geographic location; percent of the RN employees with a BSN or higher nursing degree) and personal (e.g., position title, education level) attributes. An additional set of 3 questions was offered to the participants employed in hospitals to obtain information about hospital ownership status (nonprofit, for-profit, or government), hospital size (number of beds), and specialty of the unit in which the respondent worked. National Center for Health Statistics' (2016) practices were followed to group hospitals by size and status for answer options in these questions.

Additionally, a series of questions were included to solicit participants' presurvey opinions about (a) the value they (or their employers) place on HE skills of BSN graduates or nursing employees in general and (b) their preference to hire nursing employees with HE skills. Four attitudinal questions (8a, 8b, 9, and 16) ask participants how much HE knowledge is valued within their organization, whether graduates with a BSN degree need more HE skills than most of them currently have, how interested they are in employing a BSN graduate with this HE knowledge, and if they would be more likely to have a preference for an RN with this HE knowledge and skills when hiring new employees. These questions collectively establish if respondents had any presurvey opinions about the value of HE knowledge for their nursing employees or nursing graduates in general. It can be argued that existence of such opinions and/or preferences can serve as an indicator of participants' prior experience with or prior exposure to HE knowledge.

Selection of items for inclusion in part 2 of the survey was informed by the review of prior scientific surveys of nursing administrators and customized for the purposes of this research project (e.g., Melnyk, Ford, & Troseth, 2016; Chase, 2010). To our knowledge, no similar surveys of nursing administrators on HE-related topics have been conducted in the past: our literature search in the Cumulative Index to Nursing and Allied Health Literature database, as well as in publicly available online sources, did not produce any results.

Statistical Analyses

Sample characteristics and descriptive statistics for all variables of interest, including variations in survey response rates between the five states, were reported in detail in Platt et al. (2016). The analysis presented in this paper focuses on the outcome variable: usefulness ratings of the six competencies. For these, three sets of analyses were conducted. First, paired-samples t tests were used to complete pairwise comparisons of mean ratings of each competency, in order to learn whether there are statistically significant differences between the six competencies' mean ratings. Second, bivariate

correlations were calculated between all variables. Due to the type of measurement used for each variable, Spearman's rho was used. Calculation of bivariate correlations was an important prestep before regression-based analyses as it helped to determine if predictors were related to outcome variables. Third, multiple linear regressions were estimated in which the six HE competency ratings were outcome variables and the predictors consisted of variables from the bivariate correlational analysis that were significantly associated with most or all of the competencies.

Results

Descriptive statistics for quantitative variables and frequencies for categorical variables are reported in Table 1. An overwhelming majority of the respondents found all six competencies either useful or very useful, agreed that BSN graduates need more HE skills, were interested in employing a BSN with HE knowledge, and stated that HE knowledge is valued by their employer. Most participants were clinical (vs. academic) administrators, employed at a large nonprofit hospital, holding a Master's (or higher) degree in Nursing, and occupying a mid- to lower-level managerial position. On average, almost half of the nursing employees in their organizations were reported to have a BSN degree or higher.

Differences Between Six Competencies' Usefulness Ratings: Significant or Not

Fifteen paired-sample t tests were calculated to examine pairwise differences between mean competency ratings (see Appendix B). They reveal many significant differences: 12 of the 15 t tests were found to be statistically significant at $p < .05$ or lower. Competencies 6 (interpret tables and graphs) and 1 (evaluate tradeoffs when resources are scarce) received the highest ratings followed by competency 5 (health insurance and its effect on nursing practice), then 4 (applying cost-benefit analysis for optimal decision-making), then 2 (marginal analysis), and, lastly, 3 (applying the concept of production function to increase productivity).

Relationships Between Respondents' Demographic/ Organizational Characteristics and Their Perception of Competencies

Spearman correlations were calculated between the six competency ratings and the eight demographic/organizational variables. Demographic/organizational variables included having HE knowledge valued within my organization (question 8a), BSN graduates need more HE skills (question 8b), interest in employing a BSN graduate with HE knowledge (question 9), academic vs. clinical position, low vs. high administrative position, educational component to position (yes vs. no), preference to

hire nurses with HE skills (question 16), and highest educational level of respondent (question 17). Correlations, as well as detailed definitions of variables academic vs. clinical position, low vs. high administrative position and educational component to position, are reported in Appendix C.

BSN graduates need more HE skills (question 8b) and interest in employing a BSN graduate with HE knowledge (question 9) were significantly positively correlated with all six HE competency scores. Another two variables, HE knowledge valued within my organization (question 8a) and preference to hire nurses with HE knowledge (question 16), were significantly and positively correlated with five out of six competencies, where no correlation was found between competency 5 (health insurance and its effect on nursing practice) and question 8a, as well as between competency 3 (applying the concept of production function to increase productivity) and question 16. Of the remaining four variables, only two demonstrated one significant correlation each: low vs. high administrative position was significantly correlated with competency 6 ($r = 0.12$, $p < 0.05$) and highest level of education of respondent was significantly correlated with competency 4 ($r = 0.13$, $p < 0.05$). Academic vs. clinical position and educational component to position did not correlate significantly with any of the competency ratings.

Identifying Predictors Behind the Usefulness Ratings of HE Competencies

Six standard multiple regressions were consecutively completed, where each regression was estimated using a different (alternating) competency score as a single dependent variable. The four variables that had consistently significant correlations with the competency ratings (HE knowledge valued within my organization, BSN graduates need more HE skills, interest in employing a BSN graduate with HE knowledge, and preference to hire nurses with HE knowledge) were the independent variables. Results for all regressions can be found in Table 2 below.

The model with all four predictors was statistically significant at $p < .001$ for all six regressions. Interest in employing a BSN graduate with HE knowledge was the only independent variable to be significantly associated with all six HE competencies and was the only significant predictor of competency 4 (cost-benefit analysis). For the regressions of competencies 2 (marginal analysis), 3 (production function), 5 (health insurance), and 6 (tables and graphs), BSN grads need more HE skills was also significant. For the regression of competency 1 (evaluating tradeoffs), preference to hire nurses with HE skills was an additional third significant predictor. HE knowledge valued by my employer was not a significant predictor in any of the six regressions. Thus, respondents with interest in employing a BSN graduate with HE knowledge tended to assign higher usefulness ratings for all HE competencies compared to respondents without such an interest.

Table 1 – Descriptive Statistics and Sample Characteristics				
Variable	Mean	Standard Deviation	Standard Error	Frequency
Competency 1	3.44	0.68	0.04	Very useful = 164 Useful = 110 Limited use = 27 Not useful at all = 2
Competency 2	3.10	0.85	0.05	Very useful = 115 Useful = 114 Limited use = 64 Not useful at all = 10
Competency 3	2.99	0.82	0.05	Very useful = 91 Useful = 126 Limited use = 77 Not useful at all = 9
Competency 4	3.17	0.79	0.05	Very useful = 118 Useful = 127 Limited use = 51 Not useful at all = 7
Competency 5	3.27	0.76	0.04	Very useful = 134 Useful = 122 Limited use = 42 Not useful at all = 5
Competency 6	3.41	0.76	0.04	Very useful = 170 Useful = 93 Limited use = 35 Not useful at all = 5
Sum of all six competencies	3.29	0.84	0.05	
HE knowledge valued by employer (question 8a)	3.40	0.72	0.04	Strongly agree = 146 Agree = 115 Neutral = 29 Disagree = 11 Strongly disagree = 2
BSN grads need more HE skills (question 8b)	3.31	0.83	0.05	Strongly agree = 157 Agree = 117 Neutral = 24 Disagree = 4 Strongly disagree = 1
Interest in employing BSN with HE knowledge (question 9)				Very interested = 149 Interested = 111 Neutral = 33 Somewhat interested = 7 Not interested at all = 3
Type of position				Clinical = 270 Academic = 33
Rank of administrative position				Low rank position = 222 High rank position = 81
Educational component to position				No = 261 Yes = 42
Employment setting (question 11)				Hospital = 244 Home Health Setting = 4 Public or community health setting = 1 Academic education program = 31 Ambulatory care setting (not hospital) = 1 Other = 22
Type of hospital if employment setting is hospital (question 12)				For profit = 19 Nonprofit = 210 Government = 15 Do not work in hospital = 59
				(continued)

Table 1 – (Continued)				
Variable	Mean	Standard Deviation	Standard Error	Frequency
Hospital bed size if employment setting is hospital (question 13)				6-24 beds = 3 25−49 beds = 9 50−99 beds = 21 100−199 beds = 34 200−299 beds = 54 300−399 beds = 35 400−499 beds = 28 500 or more beds = 60 Do not work in hospital = 59
If in hospital and a nurse manager, then unit specialty (question 14)				Intensive care = 9 General medical/surgical = 9 Hematology/oncology = 2 Obstetrics = 4 Emergency/urgent care = 4 Pediatrics = 3 Psychiatric/mental health = 3 Physical rehabilitation = 1 Long term care = 1 Cardiac = 3 Telemetry = 2 Other = 33 Multiple units = 69 Do not work in hospital or not nurse manager = 160
Percent of RNs with BSN or higher degree (question 15)	49.83%			
Prefer to hire RN with HE skills (question 16)				Yes = 269 No = 34
Highest level of education of respondent (question 17)				Diploma = 4 Associates = 2 Bachelors in nursing = 22 Bachelors in other = 10 Masters in nursing = 135 Masters in other = 63 PhD = 46 DNP = 21
Geographic state of employment (question 18)	3.44	0.68	0.04	California = 134 Florida = 42 Michigan = 35 Minnesota = 31 New York = 61

Note: N = 303 responses (out of 3,110 total membership, after deleting 23 responses with missing values). Please see Appendix A for the survey content in its entirety. For competencies, responses were numerically coded such that not at all useful = 1, limited use = 2, useful = 3, and very useful = 4. For questions 8a and 8b, response scale numerically coded such that strongly disagree = 0, disagree = 1, neutral = 2, agree = 3, and strongly agree = 4. For question 9, response scale numerically coded such that not interested at all = 0, somewhat interested = 1, neutral = 2, interested = 3, and very interested = 4.

Respondents who also hold the opinion that BSN graduates need more HE skills were likely to assign even higher usefulness ratings for all competencies except for competency 4 (cost-benefit analysis). Finally, usefulness ratings for competency 1 (evaluating tradeoffs) received an additional boost from respondents who also had preference to hire nurses with HE skills. While presence or absence of employer's appreciation of HE Knowledge not does not appear to affect competencies ratings. In all four regressions the effect sizes (coefficients) of significant predictors are moderate.

To summarize, statistical analyses established that (a) organizational and demographic characteristics have no significant effect on competencies' approval ratings, and (b) the only significant predictors were the three questions related to existence of respondents' presurvey opinions about the value of HE knowledge for their nursing employees or nursing graduates in general.

Discussion

The reported results are consistent with the null hypothesis, which anticipated that organizational and

Table 2 – Results of Standard Multiple Regression Analyses

Predictor Variables	Unstandardized Beta	Standard Error	Standardized Beta	t	p
Regression 1- competency 1 criterion					
Overall model statistics: $F_{(4, 298)}= 17.38$, $p <.001$. $R = 0.44$, $R^2 = 0.19$.					
Constant (intercept)	1.98	0.20	–	9.68	<.001
HE knowledge valued by employer	0.03	0.05	0.04	0.77	.442
BSN grads need more HE skills	0.15*	0.06	0.16	2.44	.015
Interest in employing BSN with HE knowledge	0.15†	0.05	0.18	2.78	.006
Prefer to hire RN with HE skills	0.39†	0.13	0.18	3.00	.003
Regression 2- competency 2 criterion					
Overall model statistics: $F_{(4, 298)} = 16.70$, $p < .001$. $R = 0.43$, $R^2 = 0.18$.					
Constant (intercept)	1.21	0.25	–	**4.77**	<**.001**
HE knowledge valued by employer	0.07	0.06	0.07	1.29	.200
BSN grads need more HE skills	0.22†	0.08	0.19	2.84	.005
Interest in employing BSN with HE knowledge	0.25‡	0.07	0.24	3.69	<.001
Prefer to hire RN with HE skills	0.11	0.16	0.04	0.68	.680
Regression 3- competency 3 criterion					
Overall model statistics: $F_{(4, 298)} = 5.72$, $p < 0.001$. $R = 0.34$, $R^2 = 0.11$.					
Constant (intercept)	1.65	0.26	–	6.42	<.001
HE knowledge valued by employer	0.02	0.06	0.02	0.34	.735
BSN grads need more HE skills	0.21†	0.08	0.19	2.72	.007
Interest in employing BSN with HE knowledge	0.22†	0.07	0.22	3.19	.002
Prefer to hire RN with HE skills	−0.18	0.16	−0.07	−1.12	.263
Regression 4- competency 4 criterion					
Overall model statistics: $F_{(4, 298)} = 11.96$, $p < 0.001$. $R = 0.37$, $R^2 = 0.14$.					
Constant (intercept)	1.71	0.24	–	7.03	<.001
HE knowledge valued by employer	0.10	0.05	0.10	1.81	.071
BSN grads need more HE skills	0.05	0.07	0.05	0.70	.487
Interest in employing BSN with HE knowledge	0.24‡	0.07	0.25	3.68	<.001
Prefer to hire RN with HE skills	0.22	0.15	0.09	1.40	.163
Regression 5- competency 5 criterion					
Overall model statistics: $F_{(4, 298)} = 9.56$, $p < 0.001$. $R = 0.34$, $R^2 = 0.11$.					
Constant (intercept)	2.12	0.24	–	8.95	<.001
HE knowledge valued by employer	−0.04	0.05	−0.05	−0.82	.412
BSN grads need more HE skills	0.18*	0.07	0.17	2.54	.011
Interest in employing BSN with HE knowledge	0.20†	0.06	0.22	3.13	.002
Prefer to HireRN with HE skills	0.02	0.15	0.01	0.15	.882
Regression 6- competency 6 criterion					
Overall model statistics: $F_{(4, 298)} = 12.96$, $p < 0.001$. $R = 0.39$, $R^2 = 0.15$.					
Constant (intercept)	1.90	0.23	–	8.19	<.001
HE knowledge valued by employer	0.03	0.05	0.04	0.62	.533
BSN grads need more HE skills	0.23†	0.07	0.22	3.23	.001
Interest in employing BSN with HE knowledge	0.15*	0.06	0.17	2.46	.014
Prefer to hire RN with HE skills	0.15	0.15	0.06	1.05	.297

$N = 303$.

* $p < .05$,
† $p < .01$,
‡ $p < .001$.

demographic characteristics have little impact on nursing administrators' perceptions of HE competencies' usefulness and, thus, other factors, possibly related to existence of respondents' presurvey opinions and/or preferences about the value of HE knowledge in general, play a larger role. Thus, the null hypothesis cannot be rejected. To our knowledge, this is the first attempt to estimate such relationships. The authors are not able to relate this finding to the larger literature. Further research would be needed to provide additional validation of the strength of this relationship.

The authors also argue that discovering significant differences between the six HE competencies'

usefulness ratings provides support for the empirical classroom observation made by one of the authors as described in the introductory part of this paper. There is a direct relationship between the amount of knowledge healthcare professionals have about the subject of HE and their perception of the usefulness of HE knowledge and skills for their professional life. At low levels of familiarity with the HE concepts, average perception of their value tends to be relatively low and, as the more familiar they get with the subject, average perception of their value tends to increase.

To provide further evidence-based support to this discussion, an additional proxy can be used to approximate the degree of nurses' familiarity with the six stated HE

competencies: the level of nursing personnel's documented deficiencies in the mastery of these skills. The extent of documented deficiencies, and how profound they are, may be an indicator of nurses being less familiar with a concept. It is not an exact measure, but it does provide additional corroborating insights that can be considered independent from this survey's results.

The high degree of consensus among nursing administrators about the importance of Competency 6, "explain and interpret statistical data in the form of tables and graphs", and competency 1, "define the concepts of resource scarcity and opportunity cost" is not surprising. In this age of data-driven decision-making, ability to interpret tables and graphs, as well as to function under the constraint of limited resources, is necessary to both nursing administrators and nursing employees. Deficiencies in many nurses' mastery of simple mathematical skills are well-documented (Eastwood, Boylea, Williams, & Fairhall, 2011; Sherriff, Wallis, & Burston, 2011; Wright, 2007; Jukes & Gilchrist, 2006), which further strengthens the argument for more education in this area, which should focus not only on boosting math and data skills per se, but also on explaining the benefits and applicability of these skills in nurses' daily routines. One of the very important skills, for instance, is a nurse's ability to examine their role in outcomes on each of their units and use this knowledge to further improve both unit and patient outcomes.

Competency 5, "health insurance and healthcare reform skills," was third highest-rated competency with the mean rating of 3.27 out of 4, and 84.4% of the respondents rating it useful or very useful. We argue that nursing administrators' degree of familiarity with this competency is still substantial, compared to their familiarity with competencies 6 (tables and graphs) and 1 (evaluating tradeoffs). Nurses' deficiencies in the mastery of this skill are well documented (Hain & Fleck, 2014) and seem to be even more profound. According to Ewoldt (2014), "[f]or many nurses, the topic of healthcare reform has as much appeal as root canal. And some nurses believe the business side of health care conflicts with their role as patient caregiver and advocate" even though, as Ewoldt (2014) continues to point out, "the business aspect of care delivery is linked to quality outcomes."

Competency 4 "cost-benefit analysis skills" was rated fourth, with the mean rating of 3.17 out of 4, and 79.8% of the respondents rating it useful or very useful. Its approval ratings were also found to be not statistically different from those of competencies 2 (marginal analysis) and 5 (health insurance). Cost-benefit analysis skills include a collection of methods facilitating the comparison of costs and benefits of different decisions in order to make the most efficient choice. This area of HE knowledge and skills is unique for several reasons. It is a relatively technical and complex topic, which usually requires concerted effort from students to master, and the language used in the wording of competencies and examples is relatively more

"theoretical" compared to the competencies that received higher approval ratings. On another hand, the concept of cost-benefit analysis is not completely unfamiliar to nurses. It is a topic that is usually threaded within a typical BSN curriculum (Platt & Kwasky, 2012), which serves as an indicator of its already-established importance for the nursing profession. We argue that, for the reasons stated above, nurses' familiarity with this competency is not absent, but is relatively low. We were not able to find any evidence of levels of nurses' mastery of this competency in the research literature. It is likely that most nurses are aware of the value and necessity of this skill, but its complexity might create barriers to its learning and acceptance. We maintain that this is the likely reason behind this competency's lower ratings.

The lowest-rated competencies 2 and 3 cover the skills and abilities required for the application of the economic concepts of marginal analysis and production function. Their mean approval ratings were 3.10 and 2.99 out of 4, respectively, with 74.2% and 67.8% of the respondents respectively rating them useful or very useful. We were not able to find any evidence of levels of nurses' mastery of this competency in the research literature. We hypothesize that these two competencies represent areas of knowledge which both nurses and nursing administrators are currently least familiar with, if at all, thus explaining this cluster's lowest ratings.

Conclusions

The highest-ranked competencies tend to be practice-oriented and deal with concepts that nursing administrators and/or nurses are already likely to be familiar with: interpreting data tables, evaluating tradeoffs/scarcity of resources, role of insurance, and cost-benefit analysis. The competencies that received relatively lower ratings (though still quite high in absolute terms) tend to be more theoretical, representing concepts with which both nursing administrators and nurses might not necessarily be familiar: marginal analysis and production functions. That said, the variability of ratings between the individual competencies does not necessarily imply that some competencies/areas of HE knowledge are less important for nurses than others. We hypothesize that this is a case of individuals not assigning high value to things they do not know much about. This is consistent with the empirical observation described in the introductory part of this paper: there seems to be a strong direct relationship between the amount of prior knowledge the audience had about the subject of HE and the perceived level of usefulness of HE skills for their professional life. At low levels of prior exposure to HE, average perception of its value tends to be relatively low; after some exposure to the subject, average perception of HE's value tends to increase.

The data analysis do not provide a direct proof of this hypothesis but rather indirectly supports it.

Policy Recommendations

This analysis highlights the importance of intensifying educational efforts aimed to increase nurses' awareness about the value of the HE skills in their everyday work. This recommendation is in line with the growing recognition that nurses' contributions to creating value in healthcare have been significant, well documented, and must be encouraged by appropriate policies. A series of research briefs from the Robert Wood Johnson Foundation's Interdisciplinary Nursing Quality Research Initiative (INQRI) in 2015 focused specifically on documenting the evidence of such contributions (Lindrooth et al., 2015) and developing recommendations for redesigning the future roles of nurses in modern healthcare landscape to further enhance nurses' contributions to value (Fraher, Spetz, & Naylor, 2015). Those recommendations included changes in educational policies and regulatory environment.

One strategy to strengthen HE education for nurses, suggested earlier by Platt and Kwasky (2012), is to incorporate HE education as a mandatory component in the accreditation standards for BSN programs in the US. Another strategy should be to provide HE education to actively practicing Registered Nurses through increasing the share and accessibility of the HE content in the continuing education (CE) offerings, which are an essential part of current professional requirements for nurses credentialed in the US.

Credentialing for nurses is a multifaceted process. For continuing nursing practice, the American Nurses Credentialing Center (ANCC) requires national certification renewal every 5 years (ANCC, 2017). The renewal period for a nursing license in individual states, as summarized from Wolters Kluwer Health (2018), ranges from 1 (6 states) to 4 years (1 state), with a median renewal period of every 2 years (40 states).

While there are multiple components to both certification and licensure renewal, CE requirements are a suitable vehicle for either introduction of nurses to the HE education or their continued education in this subject. According to ANCC (2017), "All certification renewal candidates are required to complete a mandatory 75 Continuing Education hours (CH), plus one or more of the eight ANCC renewal categories, all in your certification specialty", with most states featuring additional requirements to "continuing education" or "contact hours" (CH) (Wolters Kluwer Health, 2018a). The only requirement for the content of those 75 hours is that "a minimum of 51 percent (38.25 hours) of the 75 CH must be directly related to the full scope of your certification role and specialty" (ANCC, 2018). To increase nurses' awareness about the value of the HE skills in their profession, the ideal proposal would be to add a content requirement related to health economics.

A series of important preparatory steps to evaluate the current landscape of available CE offerings should precede formal recommendations. One step is to document the prevalence (if any) of HE-related topics among current nursing CE offerings. While a comprehensive audit of such offerings is not technically feasible because of the wide variety of CE formats (conferences, webinars, etc.), analysis of online CE courses could provide valuable insight and would be feasible because comprehensive information is readily available online for analysis.

A search of the Lippincott Williams & Wilkins CE offerings, self-reported to be the largest collection of continuing education courses online (Wolters Kluwer Health, 2018b), identified more than 1900 nursing CE activities. These were searched using keywords "econom," "cost," or "value," producing a total of 38 unique entries. Of these, only 17 courses included content related to economics/costs, six courses focused on value-based purchasing, and the remaining 15 courses did not contain any relevance to economics or costs. The 23 courses with economic content, while relevant and important, comprise only about 1% of all the Lippincott CE offerings and represent only selected areas of HE knowledge rather than capturing the full range of HE core concepts.

Several more online sources of CE education for nurses were similarly analyzed: nurse.com, another large ANCC-accredited provider of CE for nurses, ANA's Nursing Knowledge Center website, and online courses offered by the National Council of State Boards in Nursing through its Learning Extension website. Again, very few courses were loosely related to financial or economic issues. Results from this analysis of current CE offerings suggest that the necessary "infrastructure" of courses featuring basic HE content requires further development. A logical starting point for this process would be developing and making available HE-related CE courses for practicing nurses.

Supplementary materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.outlook.2018.11.007.

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