Awareness and Performance of Iranian Nurses with Regard to Health Economics: A Cross-Sectional Study

Abbas Heydari, Reza Mazloom, Ali Vafaei Najar, Mahmoud Bakhshi

Evidence-Based Care Research Center, Departments of Medical-Surgical Nursing, School of Nursing and Midwifery, 1Health and Management, School of Health, Mashhad University of Medical Sciences, Mashhad, Iran

Abstract

Background: Health costs have risen everywhere, worldwide, and nurses play a pivotal role in cost savings and in contributing to the financial stability of hospitals. Aim: This study evaluated the awareness and performance of Iranian nursing staff, with regard to health economics. Materials and Methods: A total of 175 nurses who worked in three teaching hospitals in Mashhad (Iran) were selected for this descriptive cross-sectional study, and data were gathered via a 27-item questionnaire. Statistical analysis was performed using one-way analysis of variance, multiple regression analysis, and Pearson's correlation coefficient. Results: A total of 78% (n = 39) of nurses did not have a good awareness of health economics. The overall mean score for economic awareness was 5.9 ± 2.1 (possible range, 0-16), and for economic performance was 26.6 ± 4 (possible range, 0-44). There was a significant relationship between the economic awareness and performance of nurses, and nurses in higher positions had a greater awareness of health economics. Conclusions: Considering the inadequacy of the health economics awareness and performance of nurses, it is essential that efforts are made to enhance their knowledge and behavior with regard to economic issues and cost saving in all the fields of nursing, through the use of continuing education courses and workshops.

Keywords: Awareness, health economics, nursing staff, task performance

Address for correspondence: Mr. Mahmoud Bakhshi, Department of Medical-Surgical Nursing, School of Nursing and Midwifery, Chahrrah-e-Doktora, Daneshgah st., Mashhad, Khorasan Razavi, Iran. E-mail: bakshim881@mums.ac.ir

Introduction

Health economics is a branch of economics that studies and evaluates the quantity, quality, and value of the limited resources available to healthcare systems, as well as determining how these factors best combine to produce certain services, with the aim of maximizing effectiveness and efficiency.[1] US health costs are currently 17% of the gross domestic product (GDP) and continue to rise. Many other countries also have the same trend toward increasing costs, although they spend less of their GDP on healthcare.[2] Hospital costs constitute the largest single component of healthcare expenditure,[3,4] and in developing countries, 50-80% of total annual health expenditure is allocated to healthcare facilities.[5] In Iran, 40% of the total health budget is consumed by hospital services.[6] Therefore, hospitals must be considered as the primary target of efforts to inhibit rising healthcare costs.[7] Nurses are the main users of resources in the hospital setting, by the virtue of their direct links with the patients, and because they constitute the largest group of healthcare professionals.[8] Thus, nurses play an important role in

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Heydari A, Mazloom R, Najar AV, Bakhshi M. Awareness and performance of iranian nurses with regard to health economics: A cross-sectional study. North Am J Med Sci 2015;7:384-9.
the economic management of nursing services, and they must be capable of meeting the demands of healthcare organizations, which have been increasingly concerned with growing costs and wasted resources.\textsuperscript{[9]}

Nurses must recognize the opportunity to represent their value in economic terms.\textsuperscript{[10]} Their awareness of, and participation in, logical justification of hospital costs, suitable use of resources, waste control, and providing high quality services is of vital importance.\textsuperscript{[9]}

Although great emphasis has been placed on the importance of the control of hospital costs and productivity, as well as on positive attitudes toward nurses’ participation in management and cost control,\textsuperscript{[11,12]} many nurses unfortunately do not understand how their work affects healthcare costs, or how nurses contribute to healthcare revenues.\textsuperscript{[13]} Several studies\textsuperscript{[8,14]} have confirmed that nurses have the insufficient knowledge of budget control and cost management. For example, Caroselli\textsuperscript{[14]} found that only 30% of nurses had any basic knowledge of health economics, and a qualitative study\textsuperscript{[9]} showed that nurses do not use cost management in their practice, because they focus only on the care issues. We were unable to find any evidence that a study of this type had previously been conducted in Iran. Therefore, given the importance of nurses’ participation in cost efficiency activities and subsequent cost savings, it is necessary to determine their awareness and performance with regard to health economics, as a first step. The present study was conducted to evaluate the awareness and performance of nursing staff with regard to health economics in teaching hospitals.

\textbf{Materials and Methods}

A descriptive cross-sectional study was performed at three teaching hospitals affiliated to the Mashhad University of Medical Sciences, Mashhad, Iran, between May and August 2013. The study population consisted of all nurses who worked in the medical, surgical, and critical units of these teaching hospitals. The sample size was estimated to be 170 participants, on the basis of a previous study.\textsuperscript{[14]} and using the following parameters — $s = 2.2$, $z = 1.96$, $d = 0.15$ s. In consideration of the sample size and the number of nurses in each hospital, 175 clinical nurses were selected, via a random sampling method. All the nurse managers, including the head nurse, the supervisors, and the matron from the three hospitals were asked to complete the questionnaire. Inclusion criteria were nurses employed in the hospitals of the Mashhad University of Medical Sciences, and with at least 2 years of clinical experience.

The study protocol was approved by the Ethics Committee of the Mashhad University of Medical Sciences (grant number was 900582). The purpose of the study was initially explained to respondents, who were assured that participation was voluntary. Return of the completed questionnaire was considered as a provision of informed consent to participate.

The questionnaire consisted of three parts. The first of these concerned demographic characteristics, including age, gender, educational level, hospital units of service, job position, years of experience, management, and budgeting experience. Part two consisted of 16 multiple choice questions to assess the nurses’ awareness of economic issues related to healthcare. This was divided into three subscales: “Nurses’ awareness of national and regional budgeting” (this comprised three questions, with a score ranging from 0 to 3), “nurses’ awareness of the hospitals’ income and payment system” (this consisted of four questions, with a score ranging from 0 to 4), and “nurses’ awareness of factors that affect hospitals’ costs” (this was composed of nine questions, with a score ranging from 0 to 9). Each “correct” answer was given a value of one, and “wrong” and “don’t know” answers were given a value of zero (to a maximum value of 16 points).

The passing score was determined by using the Angoff method, which is one of the most common methods used for setting cutoff scores.\textsuperscript{[15,16]} Each question is rated by a group of five subject matter experts, using criterion-referenced procedures. The expert estimates the percentage of minimally competent persons that will answer each question correctly, after which the judges’ totals are summed and averaged ($8.75 + 7.25 + 8.5 + 7.75 + 6.75$ divided by 5) to obtain a cutoff score of 7.8, or 8. Therefore, in the present study, following collaboration with an expert panel, nurses that answered at least eight out of 16 questions correctly (50%) were considered to have good awareness of the field of health economics.

Part 3 of the questionnaire contained 11 questions, and a 5-point Likert scale was used to measure economic performance. This section investigated the nurses’ performance with regard to nursing documentation, as well as consumption and use of drugs, medical supplies, and equipment. The scoring system was set between 0 and 44 points. The “Never” option was the equivalent of zero and meant that the related performance was never observed in the nurses’ clinical activities. The “Always” option was set at four points and meant that the related performance was constantly observed in the clinical activities carried out. For each question, mean scores above 3, 2-3, and below 2 were considered as desirable, moderate, and unfavorable, respectively.

The psychometric properties of the questionnaire were examined, and content validity was determined by the
means of expert review. Four individuals with a Ph.D. in nursing, three nursing administrators, and three health economists critiqued the questionnaire. To assess questionnaire reliability, we examined the internal consistency coefficient and achieved a Cronbach’s α of 0.74; values of 0.7 or higher are appropriate and acceptable.

Data were collected using a combination of the questionnaire, interviews, and observation, as well as an assessment of the available evidence. The first and second parts of the questionnaire were hand delivered to individual units by researchers, and then distributed to staff nurses by the unit manager during different working shifts. Two days after distribution, the researchers picked up the questionnaires from the three hospitals. A total of 125 clinical nurses and 50 of 68 nurse managers completed the questionnaire. The third part of the questionnaire was completed by two co-researchers after observing and interviewing the head nurse and nurses working in different shifts, as well as checking the available evidence.

Statistical analysis

Data were analyzed using SPSS (11.5 version, SPSS Inc., Chicago, IL, USA). Descriptive statistics were used for demographic and clinical characteristics. A multiple regression analysis was used to determine the predictive power of economics awareness and other variables on the economic performance of the participants. An analysis of variance and Pearson’s correlation test were used to evaluate the relationship between variables, and the level of statistical significance was considered to be $P < 0.05$.

Results

Of the 243 nurses who were invited to participate, 175 (72%) completed the questionnaire. Most were female ($n = 134$), and aged between 25 and 56 years (average, 37.5 years). Clinical work experience levels varied between 2 and 30 years (mean 13 years). A total of 95% of the participants ($n = 166$) stated that they had not received any education on health economics and cost control activities during their entire career. In addition, 97% ($n = 170$) reported that they did not participate in economic decision-making related to hospital care. Nevertheless, 70% ($n = 123$) of participants positively answered the question regarding the necessity of nurse participation in budgeting and economic issues at all levels. Other participant demographic characteristics are shown in Table 1.

The mean economic awareness score was 5.94 ± 2.11 (range, 0-13). Table 2 shows that only 22% ($n = 39$) of nurses had a good awareness of health economics, while Table 3 shows the mean scores of economic awareness and its subscales. Awareness of factors that...
affect hospitals’ costs was higher; approximately 50% of participants were knowledgeable in this regard. The level of awareness of national and regional healthcare budgeting was the lowest, and 92% of nurses did not have sufficient knowledge in this field.

There was a significant overall difference between the economic awareness of the clinical nurse and the nurse managers \((P = 0.001, 95\% \text{ CI: } -1.87 \text{ to } -0.51)\), such that nurse managers had a high level of knowledge on each of the three subscales of the questionnaire. However, among the three subscales, a significant difference \((P < 0.001, 95\% \text{ CI: } -1.07 \text{ to } -0.41)\) between the economic awareness of the clinical nurse and nurse managers was shown only in “awareness of hospitals’ income and payment system.”

In evaluating the performance dimension, the mean score was 26.68 ± 4.18. As shown in Table 4, the highest scores were related to the control of the expiration date of drugs and supplies \((3.79 \pm 0.40)\), recording the used drugs and supplies \((3.38 \pm 0.51)\), and the nurses’ supervision of the use of supplies \((3.35 \pm 0.87)\). The lowest scores were “resterilization of surplus gauzes and dressings” \((1.80 \pm 1.48)\) and “recording routine nursing care activities” \((1.74 \pm 1.60)\).

Pearson’s correlation coefficient showed that there was a significant and positive relationship between the economic awareness of nurses and their performance \((r = 0.22, P = 0.01)\). A multiple regression analysis was used to identify the major factors influencing economic performance. Economic awareness, clinical work experience, job position, and age were simultaneously considered as independent variables, and the mean score of economic performance was considered as a dependent variable. Table 5 shows that economic awareness is only within 5% in predicting nurses’ economic performance \((R^2 = 0.05, SE_{\text{reg}} = 4.05, F = 3.28, P = 0.04)\), whereas the model for clinical work experience, job position, and age was not significant \((P > 0.05)\).

### Discussion

One of the most important findings of this study was that Iranian nurses had an insufficient awareness of health economics, such that only 22% of those studied showed good economic awareness. Potential reasons for this knowledge deficit may be a lack of health economics education during nursing training courses, no nurse participation in decision-making regarding economic issues, an absence of continuing education courses and workshops, and little attention to nurses’ capacity to impact on health system costs.\[^{9,17}\] de Oliveira et al.\[^{9}\] argued that the nurses’ lack of commitment toward economic issues is related to either a lack of time or to a

| Performance                                                                 | Mean ± SD     |
|------------------------------------------------------------------------------|---------------|
| How much do the standards of documentation in writing nursing report and recording of medications? | 2.31±0.66    |
| Does the price of supplies and equipment have been specified in the unit?    | 1.90±0.74    |
| Do the patient’s supplies and medications record during working hours?       | 3.38±0.51    |
| During the treatment and caring activities, do the principles of aseptic technique, is performed? | 2.11±0.61    |
| Is the date of drugs and supplies controlled in the unit?                    | 3.79±0.40    |
| After dressing, are the surplus gauzes and cotton optimized to use or returned for re-sterilization? | 1.80±1.48    |
| Does the nurse monitor using the supplies in the unit adequately?            | 3.35±0.87    |
| Are the equipment and devices maintenance in the appropriate place?          | 2.54±0.85    |
| Is the nurse involved in the purchase of equipment and supplies?             | 1.91±0.46    |
| Are the nursing care activities recorded in Health Information System completely and accurately? | 1.74±1.60    |
| Is the lighting and air conduction equipment used suitable and adequately?  | 2.11±0.66    |

**Table 4: Performance of nurses regarding health economics**

**Table 5: Multiple regression analysis economics awareness, clinical work experience, job position, and age on mean of economic performance of nurses**

| Model                        | B   | β    | t   | P   | R²  | F   | P   |
|------------------------------|-----|------|-----|-----|-----|-----|-----|
| Constant                     | 22.1| 5.6  | 0.000|     |     |     |     |
| Model 1                      |     |      |     |     |     |     |     |
| Economic awareness           | 0.53| 0.23 | 2.3 | 0.01| 0.058| 3.28| 0.04|
| Clinical work experience     | 0.01| 0.02 | 0.11| 0.91|     |     |     |
| Model 2                      |     |      |     |     |     |     |     |
| Age                          | 0.04| 0.07 | 0.27| 0.78| 0.17| 1.63| 0.17|
| Management position          | −0.22| −0.02| −0.19| 0.84|     |     |     |

SD: Standard deviation
lack of interest regarding management issues, with the justification being that they have received no academic education in relation to economic management and had no understanding of these concepts.

A higher level of awareness with regard to “factors that affect hospitals’ costs,” compared to the other two subscales was another notable finding. Since the factors that were evaluated in this subscale were more tangible for nurses, and nurses were more involved with them in clinical practice, they had greater awareness in this area. Nurses in clinical practice understood the positive effects of various factors, such as standards of care, proper use and maintenance of supplies and equipment, and recording of medication and diagnostic tests. In another study,[8] although 94% of nurses were not involved in the hospital budgeting process, their perception of cost containment and control of supplies and equipment was positive, and over 90% were focused on the importance of procedure standardization for nurses to keep costs down.

In the present study, nurse managers had a greater awareness of health economics, but most of them did not have any role in the hospital economic decision-making process. It appears that several factors, such as the nature of the task, a greater number of administrative responsibilities, participating in related meetings and committees, and previous experience are the reasons behind this. Nurse managers are in an ideal position to not only affect unit-based economics but also to increase economic awareness and the behavior of staff nurses.[14] However, the centralized organizational structure of almost all of Iran’s general governmental hospitals makes it difficult for members within the hospital to contribute to decision-making and organizational policy.[18]

The findings showed that there was a significant relationship between the awareness and performance regarding health economics. However, this relationship was very weak, and awareness scores could explain only 5% of the variance in performance scores. This means that although nurses do not have sufficient economic awareness, they pay attention to clinical care matters, such as documentation of consumed drugs and supplies, and careful operation and maintenance of equipment and devices in practice, which have an effect on adjustment of hospital costs. These conditions are primarily the result of formal written clinical guidelines, a shortage of equipment and materials, and close control by the hospital management of the use of expensive drugs and equipment. Moreover, the results showed that the lowest score was associated with the recording of routine nursing care activities in patients’ medical records, which may be a result of its the lack of effect on patients’ final billing and hospital income.

In the present study, 97% of nurses stated that they do not participate in decision-making regarding hospital economy, while the majority (70%) had a positive opinion with respect to the necessity of nurses’ contribution to economic programs in hospital and cost control activities. It is necessary to make structural changes in the process of hospital budgeting to allow for a greater contribution from the nursing unit. Ntlabezo et al.[8] showed that only 6.6% of nurses played a role in hospital budgeting; however, 69.9% of these indicated that nurse managers should be involved in the planning of a hospital budget. A qualitative study[19] showed that most managers believe that the contribution of nurses to the cost efficiency of interventions would further boost clinical activities and job development, and, subsequently, would have a positive effect on patient care activities.

It is clear that nurses should receive health economics training prior to entrance into the profession, with the aim of enhancing productivity, reducing costs, and improving the quality of care.[9] In the present study, 81% of nurses indicated that educational programs can help to reduce hospital costs. In another study,[8] 96% of nurses stated that in-service education sessions on cost containment should be held for all the categories of nurses. Since less attention is paid to managerial and economic issues in nursing courses, it is important that nursing students become familiar with the management and economic aspects of the profession, so that in future, they are capable of properly meeting new challenges in this field.

The present study has several limitations and strengths. The main limitation was the broad nature of the health economics field, which prompted the researchers to implement a broader view in their approach, as well as the design of the questionnaire. Taking a more detailed approach, and thus evaluating all of the factors influencing nursing care, such as work environment conditions, communications, and educational and administrative plans that have an effect on costs and outcomes, would severely have affected the size of the questionnaire, which, in turn, would have contradicted the research tool designing principles, and would also have reduced the accuracy of the answers. Therefore, in order to increase the validity of the questionnaire, in addition to a preliminary study, the views of several healthcare and economics experts were also considered to maximize the healthcare economics relevance and coverage of the final questionnaire. The small sample size and inclusion of only Government Teaching Hospitals mean that the results may only be cautiously generalized to other settings. Nevertheless, this study is a critical and preliminary step that allowed a detailed assessment of economic awareness and performance in
nursing clinical practice. An evaluation of the effects of the educational courses and participation of nurses in the cost management of both unit and hospital is suggested for future studies.

**Conclusions**

The present study showed that nurses have insufficient awareness and performance regarding health economics. Considering the importance of health economics and priority in healthcare systems in the near future, managers, and staff nurses should upgrade their basic knowledge of economics, cost saving, and optimal usage of equipment and resources. This would eventually improve their clinical behavior, while maintaining the required quality standards.

**Acknowledgments**

The authors expressed their thanks to the Research Deputy at the Mashhad University of Medical Sciences who sponsored the survey. Moreover, we would like to thank and honor all nurses who helped us in this research.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Martínez-Giralt X, Barros P. Health Economics: An Industrial Organization Perspective. New York: Taylor & Francis; 2013.
2. Kaplan RS, Porter ME. How to solve the cost crisis in health care. Harv Bus Rev 2011;89:46-52, 54, 56-61.
3. Torio CM, Andrews RM. National Inpatient Hospital Costs: The Most Expensive Conditions by Payer, 2011. HCUP Statistical Brief #160. USA: Agency for Healthcare Research and Quality; 2013.
4. Jacobs P, Rapoport J. The Economics of Health and Medical Care. Boston: Jones & Bartlett Publishers; 2004.
5. Newbrander WC, Barnum H, Kutzin J. Hospital Economics and Financing in Developing Countries. Geneva: World Health Organization; 2000.
6. Rezapour A, Arabloo J, Azar FEF, Soleimani MJ, Safari H. Microeconomic analysis of healthcare services in Bou Ali Sina University Hospital. Int J Hosp Res 2012;1:41-50.
7. Carruth PJ, Carruth AK. Controlling medical costs: Perspectives from financial and nurse executives. J Bus Econ Res 2007;5:1-8.
8. Ntlabezo ET, Ehlers UV, Booyens US. South African nurse managers’ perceptions regarding cost containment in public hospitals. Curationis 2004;27:34-42.
9. de Oliveira WT, Rodrigues AV, Haddad Mdo C, Vannuch MT, Taldivo MA. Conceptions of nurses from a public university hospital regarding the cost management report. Rev Esc Enferm USP 2012;46:1184-91.
10. Lattavo K. National Nurses’ Week: Making the economic case for nursing. Medsurg Nurs 2013;22:73-4.
11. Dall TM, Chen YJ, Seifert RF, Maddox PJ, Hogan PF. The economic value of professional nursing. Med Care 2009;47:97-104.
12. Warburton RN. Improving patient safety: An economic perspective on the role of nurses. J Nurs Manag 2009;17:223-9.
13. Penner SJ. Economics and Financial Management for Nurses and Nurse Leaders. New York: Springer Publishing Company; 2013.
14. Caroselli C. Economic awareness of nurses: Relationship to budgetary control. Nurs Econ 1996;14:292-8.
15. Azzarello J. Setting valid cut-off scores for competency. J Nurses Staff Dev 2003;19:238-43.
16. Alston GL, Haltom WR. Reliability of a minimal competency score for an annual skills mastery assessment. Am J Pharm Educ 2013;77:211.
17. Myrick F. Educating nurses for the knowledge economy. Int J Nurs Educ Scholarsh 2005;2:20-7.
18. Maleki MR, Gohari MR, Ghorbaniian A. Relationship between structural empowering and nurses’ readiness for change. Iran J Nurs 2012;25:1-9.
19. McKenna H, Keeney S, Hasson F. Health care managers’ perspectives on new nursing and midwifery roles: Perceived impact on patient care and cost effectiveness. J Nurs Manag 2009;17:627-35.