Running Head: VETERANS HEALTH ADMINISTRATION EXECUTIVE SKILLS

Executive Competencies of Nurses within the Veterans Health Administration:

Comparison of Current and Future Nurse Executive Views

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Acknowledgements

Abstract

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14. ABSTRACT
This study determines if current and future nurse executives differ in their perceptions of the skills, knowledge, and abilities (SKAs) required to be successful in the role of nurse executive within the Veterans Health Administration (VHA). Using the Delphi method for executive decision-making, 144 current nurse executives, as well as 168 nurses identified for potential selection to this position judged the relative importance of SKAs using a scale with 1 = unimportant to 7 = important. The main outcome measures are the main effects of group membership (current versus future nurse executives), differences among items within eight specific domains, and assessment of potential interaction effects for the dependent variable of SKA item importance ratings. The results include no main effects for overall rating differences between the current and future nurse executive groups were found for any of the eight domains; however, statistically significant and systematic within-main-effect differences were detected for SKA items in all domains. The importance ratings given SKAs in the eight domains were highly similar between the two groups.

15. SUBJECT TERMS
SKA - skills, knowledge, and abilities
ANOVA - analysis of variance

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Introduction

Conditions Prompting Study

This research effort continues builds upon previous research defining the role of the nurse executive within the Veterans Health Administration (VHA) and contributes to the existing body of literature. The objectives are to identify competencies that current executive nurses will need in the future and to define the skills, knowledge, and abilities (SKAs) needed to address those competencies. Skills are the technical expertise, knowledge is the possession of facts and principles, and abilities encompass the physical, mental, or legal power (Hudak, Brooke, Finstuen, & Riley 1993). Through strategic planning initiatives, the VHA has identified the need for competency forecasting to ensure that future nurse executives are well equipped to meet the challenges of providing healthcare to the nation's veterans. The purpose of this study is to reach consensus among VHA nurse executives about the SKAs required to perform at the senior executive level now and in the next 5 to 10 years.

This study design creates the mechanism to tap into the expert opinion of all VHA nurse executives to identify what they believe are the crucial competencies for success. This study helps to further define and support the strategic goal of leadership development. The Leadership Development Workgroup was charged with developing content for career development programs and the results of this study help to further define and focus the efforts of these programs (Department of Veterans Affairs, 2001c). Through successful identification of competencies necessary for future success, appropriate training and mentoring modalities can be created. By affording all current nurse executives the opportunity to identify the competencies and rate the skills, knowledge, and abilities the VHA is allowed to garner greater buy-in and acceptance of the overall leadership plan and implementation processes.

Veterans Health Administration

The Veterans Health Administration is one of three administrations within the Department of Veterans Affairs (VA) and is the largest integrated health system in the United States (Perlin, Kolodner, & Roswell, 2004). The VA was established in 1930 and enhanced following World War II and the Servicemen's Readjustment Act of 1944. The Veterans Administration was elevated to Cabinet status in 1989 and became the Department of Veterans Affairs.

Veterans make up 10 percent of the nation's population, but only a minority receive care through VHA (Page, 2002; Kizer, 1999). Eligibility is triaged according to the available budget; those with compensable, service-connected disabilities are assigned the highest (Department of Veterans Affairs, 2001c). VHA serves as a payer of last resort for treatment that is not related to service-connected disabilities but is provided through VHA facilities. Health care is delivered through 22 regional health care systems, referred to as Veterans Integrated Service Networks (VISNs). Each VISN contains 7 to 10 hospitals, 25 to 30 ambulatory care clinics, 4 to 7 nursing homes, and other care delivery units (Kizer, 1999). Most clinical and administrative staff is employees of VHA. Approximately 19 percent of the total VHA population sought inpatient and outpatient mental health services (including those related to substance abuse) in 2000 (Corrigan, Eden & Smith, 2002).

The mission of the VHA is to serve the needs of America's veterans by providing primary care, specialized care, and related medical and social support services. To accomplish this mission, VHA needs to be a comprehensive, integrated healthcare system that provides excellence in health care value, excellence in service as defined by its customers, and excellence in education and research, and needs to be an organization characterized by exceptional accountability and by

being an employer of choice (http://www1.va.gov/health_benefits/page.cfm?pg=1 retrieved

August 1, 2005).

VHA health care is patient-centered and is nationally recognized as a benchmark for health

care management and delivery. The Institute for Medicine (IOM) report, Leadership by Example,

praises VHA for its use of performance measures to improve quality in clinical disciplines

including ambulatory, hospital, and long-term care. The report states that VHA's integrated

health care system is one of the best in the nations (Corrigan et al, 2002).

VHA Nursing

The VHA nursing workforce grew during fiscal year 2004, the largest increase seen in the

number of Registered Nurses (RNs). The VHA workforce is older than the private sector with the

average age of RNs is 48.7 years; Licensed Practical Nurse (LPN) average age is 46.4; and

Nursing Assistant (NA) average age is 46.2 years. VHA has a positive trend as employer of

choice for men and ethnic minorities in nursing (Department of Veterans Affairs, 2001b). VHA

nursing is an integral component of the nation's healthcare delivery system. One in four

professional nurses in the country receive some of their clinical education within the VHA

(Department of Veterans Affairs, 2001a). VHA is recognized nationally as an innovator of

integrated patient information and safety systems and developing information technology. VHA

nursing personnel provide a wide array of services to veterans in many settings, including acute,

long-term, psychiatric, home, and primary care settings. In addition to clinical nursing care, VHA

nurses serve as leaders in program development and implementation, participate in committees,

and are the critical component to meeting national patient care performance measures (National

Commission on VA Nursing, 2004).

The Chief Nursing Officer heads the Office of Nursing Service (ONS) that has responsibility for centrally supporting VHA nursing personnel. ONS serves as a consultative role to the facility nursing staff. Facility nurse executives have direct supervisory responsibility for facility nursing personnel. Facility nurse executives participate in national level decision making through the National Nurse Executive Council (NNEC). Membership of the NNEC includes one nurse executive from each Veterans Integrated Service Network (VISN) and Central Office program directors. The Chief Nursing Officer located in VA Central Office chairs the NNEC. The NNEC establishes, reviews, revises, and administers the national nursing strategic plan. Deployment of the plan is accomplished through work groups chaired by NNEC members in collaboration with staff at the VISN and facility level. NNEC members are charged with obtaining feedback from other nurse executives in the VISN and facility level.

The strategic plan identifies six goals that include leadership development: defined as operationalizing the VHA High Performance Development Model (HPDM) for all levels of nursing personnel; technology and system design: defined as developing and enhancing systems and technology to support nursing's role in health care delivery models; care coordination and patient self-management: defined as strengthening nursing practice for the provision of high-quality, reliable, accessible, timely, and efficient care in all settings; workforce development: defined as recruiting and retaining a qualified nursing workforce; collaboration: defined as identifying, developing, and communicating partnerships between nursing and "external" organizations; and evidence-based practice: defined as identifying and measuring key indicators to support evidence-based practice (VHA Staff, 2002).

The National Commission on VA Nursing, established by Public Law 107-135, published its final report in May 2002 outlining legislative and organizational policy changes in the areas of

leadership, professional development, work environment, respect and recognition, fair compensation, technology, and research/innovation. The commission was charged to consider and recommend legislative and organizational policy changes that would enhance the recruitment and retention of nurses and other nursing personnel and assess the future of the nursing profession within the Department of Veterans Affairs. The 12-member commission was given a 2-year timeframe to complete this task.

The Commission stated the desired future state of VHA nursing is:

VA Nursing is a dynamic diverse group of honored, respected and compassionate professionals. VA is a leader in the creation of an organizational culture where excellence in Nursing is valued as essential for quality healthcare to those who have served America. (Caring for America's Veterans: Attracting and Retaining a Quality VHA Nursing Workforce Final report, 2004, pages ES1-ES2).

To achieve this state the Commission's recommendations were focused in the following areas: leadership, professional development, work environment, respect and recognition, fair compensation, technology, and research/innovation. The Commission evaluated information from several sources including the available literature, national health care trends, VHA health care and nursing trends, conducted hearings and forums, and information from stakeholder groups.

The recommendations regarding leadership and professional development address legislative and organizational policy changes that seek to enhance the recruitment and retention of nurses and other nursing personnel by the VHA. The leadership recommendations include addressing nurse executive authority, responsibility and accountability for nursing practice and personnel; nurse executive membership of the executive body at the VISN and facility levels;

nurse executive accountability of nursing performance, leadership development, development and implementation of clinical leadership roles; and compliance with the standardized Nurse Professional Standards Board protocol (National Commission on VA Nursing, 2002).

The professional development recommendations include: VHA should structure career development opportunities; VHA should establish national policy guidelines for schools of nursing; and VHA should assure that the VA Health Professionals Educational Assistance Program is as equitably funded as other federal programs. The Commission found widespread support for the funding of nursing education however, there appears to be no coordinated plan for individual development (National Commission on VA Nursing, 2002). This issue necessitates attention to ensure nurse executives of the future are fully qualified and prepared to address the complex health care environment in which they work.

National Nursing Shortage

The national nursing shortage is a priority for every healthcare system in America. It can be anticipated that the combination of issues facing the VA to include the aging workforce, increasing military involvement around the world, and increasing healthcare costs will increase enrollment numbers within the VHA. Projections include that the average patient enrollment will increase by 39 percent (6.4 million to 8.9 million) from FY 2002 through FY 2012. Veterans seeking care over this period are expected to increase by 31 percent (VHA, 2001), resulting in an increased demand for nursing personnel. The civilian healthcare system is concurrently facing aging baby boomers, nationwide nursing shortages, and rising costs of delivering healthcare. This external environment makes addressing future requirements of nursing leadership critical to the future success of the VHA.

The VHA is experiencing difficulty in hiring nurses with selected specialties and in certain geographical areas. Additionally, 33 percent of current VHA nurses are eligible to retire by 2005. When combined with the national nursing shortage, this potential loss of nurses could jeopardize the VA healthcare mission (Department of Veterans Affairs, 2001c). There are 35,000 registered nurses (RN) comprising the largest segment of healthcare worker in the VHA. The combination of the following demographics makes this a salient and time-sensitive problem: 23 percent of RNs are under the age of 40; compared to 31.7 percent in the US; the average age of a VA RN new hire in FY 2000 was 41.65 years; VA is currently experiencing difficulty recruiting nurses; the national nurse supply will decline; and VA nurses will be eligible for retirement in large numbers through 2005: RNs 35 percent, LPNs 29 percent, nursing assistant 34 percent (Department of Veterans Affairs, 2001c). Coupled with an aging veteran population requiring more complex, professional nursing care brings the problem to the forefront of healthcare planning for the VHA (Office of Performance and Quality, 1998).

<div align="center">Review of the Literature</div>

The IOM report, *Keeping Patients Safe: Transforming the Work Environment of Nurses* (Page, 2004) describes the relationship between work environment and the delivery of safe patient care. The IOM cites four serious threats to patient safety. The threat most pertinent to executive nursing is the failure to follow management practices necessary for safety. These include balancing the tension between production efficiency and safety, creating and sustaining trust throughout the organization, actively managing the processes of change, involving workers in decision-making pertaining to the design of work and it flow, and using knowledge management practices to establish the organization as a "learning organization." The IOM found that loss of trust in hospital administration is widespread among nursing staff and that clinical

nursing leadership has been reduced at multiple levels thereby diminishing the voice of nurses in patient care decisions.

The other side of the spectrum is observed in magnet hospitals. Here the nursing leadership is characterized as participative, with executive and unit leaders seen as visible and influential. The nursing structure is one of a strong, visionary, and visible chief nurse executive and dynamic manager for the units. Additionally, these hospitals are characterized by their commitment to the development of future managers and leaders. Magnet faculties generally offer programs for assessment and training of managers. Staff nurses view management training as a form of recognition and are eager to participate in these educational offerings (McClure & Hinshaw, 2002).

The importance of healthcare administration to the overall quality of a healthcare organization was emphasized on a national level during the 1990s. Congress gave the Agency for Healthcare Research and Quality (AHRQ) a mandate to report annually about health care quality (Lighter & Fair, 2004). The National Healthcare Quality Report (NHQR) includes a broad set of performance measures used to monitor the nation's progress towards the provision of quality care. The report includes a section discussing the status of healthcare administration in the United States. The success of a healthcare organization is dependent on the quality of direct patient care staff and executives. Healthcare executives are trained in a variety of educational programs. These programs teach healthcare executives the competencies and associated SKAs needed for future success. Therefore, competency and SKA identification (forecasting) must be conducted in order to develop quality training and educational programs for healthcare executives.

A review of the literature regarding civilian nurse executives suggests that nurse leaders must be competent in business, leadership, and communication skills. (Lighter & Fair, 2004; O'Leary & O'Leary, 1999; Sanford, 1994). Many of the articles are qualitative in nature. The competencies identified as important were based on anecdotal information received from interviews with nurse executives. The literature also demonstrates that there are different views of how nurse executives should be educated (Sanford, 1994). According to Sanford (1994), 33 percent of chief executive officers (CEOs) prefer their chief nurse executives to with a Masters of Science in Nursing, 40 percent wanted individuals with Masters in Healthcare Administration, and 25 percent believed the Masters in Business Administration (MBA) was the ideal degree.

A five-year study conducted by VHA, Inc., health care provider alliance of more than 2,200 not-for-profit health care organizations, examined the changes in the nurse leader roles as the result of organizational design. The participants included all nurse executives in VHA organizations and the membership of the American Organization of Nurse Executives for a total of 321 respondents.   The study concluded that to be successful nurse leaders must understand how to 1) lead across cultural, functional, and departmental boundaries; 2) promote teamwork and build and maintain effective teams; 3) manage personal growth by objectively challenging their own behaviors and beliefs; 4) promote the continued development of the nursing profession in the integrated patient care environment; and 5) tolerate ambiguity (Gelinas & Manthey, 1997)

While the literature review yielded many qualitative articles regarding civilian nurse executives, there appears to be a scarcity of empirically based nursing executive competency research. There is, however, substantive literature on quantitative research regarding more generalized nursing, allied health, healthcare, education and research priorities (Bowles, 1999; American College of Healthcare Executives, 1984; 1987; 1991; Richie, Tagliareni, & Schmit,

1979), many of which have employed the RAND corporation's Delphi technique (Helmer, 1967;

Dalkey, 1969).

The literature has reflected considerable interest in forecasting the future of health service

delivery and in estimating executive skills that will be needed to compete successfully with

organizational demands (Hudak, Brooke, Finstuen, & Riley, 1993). Despite the increasing

movement from inpatient to ambulatory settings, the majority of studies address non-clinical

health care executives in hospital settings (Hudak et al., 1993). Research specific to healthcare

executive competencies has been the primary focus of a variety of investigations conducted by

the Army-Baylor University Graduate Healthcare Administration Program (Hasson, Keeney, &

McKenna, 2000; Fink, Kosecoff, Chassin, & Brook, 1984; and Ehrat, 2001). The body of work,

which employs several iterations of executive group decision making, and referred to as the

Hudak Methodology, consists of a stream of tailored executive research studies based, in part, on

the RAND corporation's Delphi technique (Griffith, Warden, Neighbors, & Shim, 2002). One

recent Army-Baylor executive competency (ABEC) study, commissioned by American

Pharmacists Association (APhA) in conjunction with the University of Pennsylvania's Wharton

school, identified executive pharmacy leadership skills, knowledge, and abilities for a group of

graduates from the GlaxoSmithKline executive management program for pharmacy leaders

(Meadows, Maine, Keyes, Pearson, & Finstuen, 2005). Another recent study employed the

technology for the identification of radiographic and computer needs between a national sample

of military and civilian subject matter experts (Rothfuss, Chaffin, Luciano, Finstuen, &

Mangelsdorff, 2005). Hudak and colleagues reviewed six ABEC studies and identified the

competencies critical to the success of all healthcare executives (Hudak et al, 1993). These

competencies included cost-finance, leadership, and ethics. Top rated SKAs include:

management, human relations and building and maintaining trust when making difficult

decisions (Calhoun, Davidson, Sinioris, Vincent, & Griffith, 2002).

Although the ABEC studies have identified competencies at the executive level in several

healthcare career fields in both the Department of Defense (DoD) and the civilian sectors (e.g.

administrators, physicians, dentists, pharmacists, etc.), to date there has been only one study

charting nurse executive competencies (Duperrior, 1995; Duperrior & Finstuen, 1996). In that

study, Duperroir and Finstuen concluded that a firm understanding of leadership, managed care,

business management, staffing management, quality management, licensure and education, and

ethics are vital to the success of the Navy nurse executive. The skills, knowledge, and abilities

(SKAs) required of successful military nurse executives included vision, competence in strategic

management, ability to work in a multidisciplinary environment, and knowledge of finance,

quantitative and communication skills. Nurse executives were found to be visionary leaders who

ensure that the Department of Nursing (DON) and its staff are able to deal with the rapid changes

that occur in the constantly changing healthcare environment.

A review of VHA nurse executive competencies revealed information regarding the

HPDM (VHA Staff, 2002). Conceptually the model consists of eight core competencies:

organizational stewardship, interpersonal effectiveness, systems thinking, technical skills,

creative thinking, flexibility/adaptability, customer service, and personal mastery. The HPDM is

now fully incorporated into the framework for leadership development in the VHA (VHA

Employee Development Report: HPDM, n.d.). The HPDM encompasses a four-tiered model

that ranges from entry-level employees in Level I to senior executives in Level IV.

The literature is clear that strong and effective nurse leadership is a critical component for

excellence in nursing practice. The Institute of Medicine (IOM), *Keeping Patients Safe:*

Transforming the Work Environment of Nurses (Keeping Patients Safe, 2004) highlights the relationship between work environment and the delivery of safe patient care. The report also states that transformational leaders engage their followers toward pursuing jointly held goals and are perceived to be "inspiring" by their followers. Communication is a central theme in this report and throughout the literature reviewed.

Purpose (Variables/Working Hypotheses)

This study identifies the competencies current Veterans Health Administration (VHA) nurse executives will require in the future and defines the accompanying skills, knowledge, and abilities (SKAs) required to successfully execute the identified competencies.

This study tests the hypotheses: Ho_1: There is no difference between group membership Ha_1: There is a difference between group membership. Ho_1: There is no difference in importance of each SKA within specific domains. Ha_2: there is a difference in importance of each SKA within specific domains. Ho_3: There is no difference between the ratings of specific SKAs between groups to overall group rating patterns. H_{a3}: There is a difference between the ratings of specific SKAs between groups to overall group rating patterns.

Method and Procedures

A collection of SKAs deemed important to VHA nurse executives was developed in a previous study that used the Delphi method for executive decision-making (Appendix D). In this initial study utilizing the Delphi method for executive decision-making, 144 directors of nursing within the VHA in the grades of GS-14 to Senior Executive Service identified the five top competencies believed to be necessary for nurse executives and the SKAs essential to achieve those competencies. An expert panel sorted the individual competencies into the eight core domains of the VHA High Performance Development Model (HPDM). Subsequently, the

executive respondents rated the previously identified SKAs on a 7-point bipolar scale according

to their perceived importance of the SKA to the future performance by the nurse executive. The

Delphi method was originally developed by the RAND Corporation and has been used in the

healthcare setting to forecast future trends and priorities (Helmer, 1967). During the round two

of the previous study, nurse executives rated SKA items within eight domain categories. A 7-

point relative importance rating scale anchored at the extremes, 1= unimportant to 7= important

was used to assess respondent judgment of SKAs. Background and demographic data including

age, gender, years of experience, education, and professional affiliation were also collected.

The present study compares the perceptions of importance held by current and future

nurse executives in the VHA of nurse executive-related SKAs. This researcher asked individuals

identified as future nurse executives to provide relative importance ratings using the same

questionnaire employed in the aforementioned study. The structured questionnaire was

administered on the worldwide web with passwords and usernames sent via electronic mail to

168 future nurse executives in VHA. Future nurse executives are operationally defined as nurses

formally identified by current nurse executives to the Office of Nursing Service, VA Central

Office, as potential candidates for formal leadership roles within VHA.

To ensure anonymity at all points during the study, a username and password was sent

out via electronic mail. The questionnaire was completed via email, U.S. mail, fax, or on the

website dedicated to the study. All information was contained in a database that does not contain

names. The website dedicated to this study ran on the same server as a Department of Veterans

Affairs (VA) nurse executive study (see Appendix D). The web server runs on Microsoft Internet

Information Server 6.0 and uses Microsoft FrontPage 2003 to edit and configure the site. The

backend data was collected and processed via a Microsoft Access 2003 database. This design

saved time by providing direct access to collected data and eliminated the need for the researcher to manually create a database once questionnaires were received by mail.

Non-identifiable demographic information was collected via the web. This information includes gender, age, years working for the VHA, years as a nurse, intention to pursue the nurse executive track, and professional affiliation.

Content validity was addressed in this study through the use of a research instrument that incorporates the insights of nurse executives and was validated by an expert panel consisting of five nurse executives. These nurse executives held senior leadership positions in the VA, DoD, civilian, and academic institutions. Construct validity was achieved through the use of data-gathering methods, techniques, and analysis that have been successfully used in previously published Delphi studies (Brown, Cochran, & Dalkey, 1969).

Descriptive summaries, including means and standard deviations (SDs) of both current and future nurse executive groups, were developed for biographic, experience, and education data and for all item importance ratings within the eight domains: organizational stewardship, interpersonal effectiveness, systems thinking, technical skills, creative thinking, flexibility/adaptability, customer service, and personal mastery. To assess the reliability of the SKA ratings within the domains, a Cronbach's coefficient α for separate and combined groups was calculated (Nunnally, 1978). For each of the SKA item domains, a two-factor split-plot analysis of variance (ANOVA) mixed design with repeated measures on one factor was performed to determine main effects of group membership (current versus future nurse executives), to determine rating differences among specific SKA items within domains, and to assess potential interaction effects for the dependent variable of SKA importance ratings (Winer, 1971; Bruning & Kintz, 1977; Kirk, 1968). Researcher planned on performing a post hoc test if

significant interaction emerged. This involves the use of F tests for "simple main effects" analysis (Nunnally, 1978; Winer, 1971). The F tests involves the proper error term denominator of the F ratio becomes the within-cells mean square, derived from the ANOVA table subjects' residual components, and the numerator represents the mean square of the groups' deviations for any given single item within the domain. Simple main effects tests are recommended as the appropriate procedure for post hoc comparisons since they lessen the probability of committing type I errors, which would be likely to occur if all domain item comparisons were examined employing independent sample Student t tests for importance differences between group means.

The ANOVA tests for significant differences between mean scores of two or more groups on one or more variables. A two-way ANOVA design consists of one grouping factor with one or more observations on each combination of grouping factors. The main effect grouping factor in this study uses the current nurse executives vs. the future nurse executives. The observations are the ratings of the SKAs within the identified competency domains. The results from this testing will allow the researcher to examine three factors: the main effects of group membership (current versus future nurse executives), the relative importance of each SKA within the specific domains, and the potential interaction effects among the SKA ratings (i.e., an analysis of the difference between ratings of specific SKAs between groups to overall group rating patterns).

The decision criterion for significance for the two-way repeated measures ANOVA is $\alpha \leq$ .05 for two-factor ANOVA with repeated measures on second factor. The results of the test will allow the research to examine three factors: the main effects of group membership (current versus future nurse executives), the relative importance of each SKA within the specific domains, and the potential interaction effects among the SKA ratings (i.e., the difference of ratings on specific SKAs between groups and overall group rating patterns).

Results

Demographics

In the previous study (Appendix D), 58 of 144 current nurse executives provided

importance ratings for the SKAs, for a response rate of 48.2%. Future nurse executives

responded at a higher rate, returning 102 of 168 questionnaires, for a response rate of 60.7%.

Table 1 summarizes the background and experience of individuals in the two groups. On

average, the 104 future nurse executives are approximately 50.14 ± 6.57 years old with $20.88 \pm$

9.11 years of clinical experience and 11.09 ± 7.91 years of administrative experience. In

contrast, the 58 current nurse executives were an average of 53.71 ± 5.21 years old, with an

average of more than 26.93 ± 9.98 years clinical experience (administrative experience not

reported). All but 4 (6.90%) current nurse executives are women, which are similarly noted for

future nurse executives with 8 (7.70%) males. Professional affiliation with the American

College of Healthcare Executives (ACHE) varied greatly between the current and future nurse

executives. Over 76% of current nurse executives are affiliated with ACHE, a healthcare

administration focused professional organization. This is stark contrast to the future nurse

executives with only 14% of individuals affiliating with ACHE. Over 67% of future nurse

executives are affiliated with nursing-focused professional organizations. Current nurse

executives did not report other affiliations. Formal educational attainment varied only slightly

between the two groups. The largest difference is seen in the percentage of individuals with non-

nursing bachelors degrees. Only 2 (3.4%) current nurse executives reported holding a bachelor

degree in a non-nursing field compared with 10 (9.6%) of future nurse executives.

Analysis of SKA Importance Ratings

Descriptive Statistics

Respondents assigned all 100 SKA items importance ratings on a 7-point scale, where 1=

unimportant and 7= extremely important. Interrater reliability of SKA item importance ratings

was assessed using Cronbach coefficient α (Nunnally, 1978). Coefficients were computed for

separate and combined respondent groups across each of the eight nurse executive domains. The

α coefficient is a measure of the internal consistency of rating responses and an expression of the

stability of the item rating means (Nunnally, 1978). Domains and the number of SKA items

within each domain are shown in Table 2. Coefficients for future nurse executive respondents

ranged from .75 for the personal mastery domain to .90 for the domain of systems thinking.

Coefficients for the current nurse executives followed a very similar scale from a low of .78 for

the personal mastery domain to a high of .90 for the systems thinking domain. For both groups,

α levels are within the acceptable range of greater than .70 as discussed by Nunnally (1978) and

can be interpreted as evidence of consistent and reproducible levels of importance rating

agreement among current, future, and both nurse groups combined.

All 100 SKA items rated by both groups had importance ratings greater than scale point 4

(neutral on a 7-point rating scale). The lowest average rating for both groups was "conceptual

knowledge of Local Area Network, Wide Area Network, and wireless networks" in the

Technical Skills domain. Both groups selected SKAs with an ethics focus as the highest rated.

The highest rated SKA for both the current and future nurse executives was "ethical decision

making ability" (personal mastery domain) with a rating of 6.79 ± 0.49 and 6.77 ± 0.49,

respectively. This is consistent with previous Delphi studies with civilian nurse executives rating

ethical standards the highest using a similar scaling methodology (Carroll, 2005)

Nurse executive group mean importance ratings and SDs for the two highest-rated items

within each of the eight domains are displayed in Table 3. All importance means listed for each

group fall above 6.00 for both groups. In all eight domains the two groups have at least one identical item present. In six domains, organizational stewardship, technical skills, creative thinking, flexibility/adaptability customer service, and personal mastery, both groups rated the same SKAs as the top two most important. The two groups rated the top SKA in six domains in a nearly identical manner. In the remaining two domains, interpersonal effectiveness and systems thinking, the two groups share the highest rating for each commonly rated SKA and differ in the second highest rated SKA.

The top SKA for both nurse executive groups in the organizational stewardship domain was "ability to collaborate." "Conflict resolution skills" emerged as the highest jointly agreed upon item in the interpersonal effectiveness domain. The future and current nurse executives rated "Ability to lead change" in the systems thinking domain highest. In the creative thinking domain, both groups rated "integrity and ethical conduct" as the highest and "openness to new ideas" as the second highest. Both groups rated "Ability to develop/maintain work environments attractive to nurses" in the flexibility/ adaptability domain highest. Both SKAs were rated in identical importance for the customer service domain, "ability to continuously learn" and skill in linking clinical outcomes to staffing," respectively. Of the seven items in the personal mastery domain, both groups rated "ethical decision making" as the highest.

Inferential Statistics

For each of the eight SKA item domains, a two-factor split-plot ANOVA mixed experimental design with repeated measures on one factor was performed to test hypotheses of differences in overall group membership (current versus future nurse executives) and differences among specific SKA domain items, and to assess potential interaction effects for the dependent

variable of SKA importance ratings (American College of Healthcare Executives, 1991; Nunnally, 1978; Winer, 1971). F ratios obtained by the ANOVA series are displayed in Table 4. Three F ratios are listed for each of the eight domains: the main effect for overall rating differences between nurse executive means, a second main effect for overall rating differences within SKA items, and an interaction effect of groups and items. No significant main effects for overall differences between current and future nurse executive groups emerged for any of the eight domains. This indicates that the two groups did not differ in their overall style in rating the importance of SKA items.

However, statistically significant (P<. 001) and systematic within item main effect differences were detected among SKAs within all domains with F ratios ranging from $F_{5, 800} =$ 14.433 for customer service to $F_{12, 1920} = 95.888$ for technical skills. This consistency suggests that both groups were attentive to the rating task and carefully differentiated among items in terms of relative perceived importance. There were no significant interaction effects present for any domain suggesting that the two groups did not vary in their overall perception of the importance of the domains.

Discussion

The findings of these studies highlight important similarities and critical differences between current and future nurse executives within the VHA concerning perceptions on key SKAs necessary for success. The high degree of agreement between future and current nurse executives practicing in the VHA is very positive. This indicates that current nurse executives and the organization are effectively mentoring future nurse executives. These results are also suggestive that future nurse executives are paying close attention to the changing healthcare and practice environment and learning from their own varied experiences and the advice of more

experienced nurse executives. A strong commitment to self-improvement is essential for the continual personal and organizational success.

While there exists no statistically significant differences in the perceptions of the two groups, there are slight differences in the perceptions of several SKAs. These difference point to opportunities for improvement and a possible need to focus professional development efforts in a somewhat different direction. The greatest differences in perception of importance were seen in the technical skills domain. Many SKAs in this domain focus on data interpretation and analytical thinking. These skills are typically not core elements of most undergraduate nursing education programs and are typically part of graduate nursing education. Future nurse executives without advanced nursing degrees must develop these skills through experiential training or additional academic instruction. A higher percentage of current nurse executives have advanced degrees (both nursing and non-nursing) further implecating the importance of a strong career development-training program for future nurse executives.

Concerns of nurse executives regarding necessary competencies for success in the next 5 to 10 years appear to be driven by essential health services managerial competencies concerned with traditional administrative and management activities. The most highly rated SKA for both groups' involved ethics, a trend not as heavily emphasized in the ABEC studies or other literature on executive skills. However, the importance of ethics in the business setting is well noted. The remaining highest competencies are well dispersed among domains. Similar to other executive skills studies in the literature, personnel skills dominated the highest rated SKAs. The abilities to relate, collaborate, and interact with staff and other professionals, were rated very highly as were the abilities to change and to manage conflict. These findings emphasize and

affirm the role of traditional executive leadership functions for successful executives of the future.

The importance of these findings in the VHA underscores the primary difference between the federal system and the civilian sector. Most, if not all, VHA nurse executives are trained and grown from within the system rather than hired-in from outside agencies. Because of this, it is all the more imperative that future nurse executives and potential job candidates obtain competencies and associated SKAs through academic preparation and experiential training tailored to the systems where they will experience their professional development, promotions, and career progression.

The VHA currently utilizes the High Performance Development Model, which identifies eight core competencies necessary for nurse executives. This study has further enhanced, verified, and discerned to be viable by specifying an array of supporting, underpinning competencies from current VHA nurse executives in the field. The core competencies of the model have been prioritized herein and ranked by frequencies as operationally defined by the expert panel and the specified underpinning field generated competencies have been prioritized within the core competencies by rated importance as expressed by the current VHA nurse executives.

The results of this study may have a profound impact on the future of VHA executive nursing. After this assessment of essential nurse executive competencies, nurse executives may integrate these results into educational and professional development programs. Outcomes from the competency list are expected to be useful for mentoring, self-assessment, and professional development. They should augment and clarify the relative importance of components contained in the draft HPDM. Formal professional development of nurse executives may be modified to

include instruction and training on many of the SKAs generated from this study. Specific SKAs can provide a means for developing job requirements and career performance criteria at a behavioral task level, and can contribute information for identifying continuing education and professional conference topical needs. Continuing education programming at annual VHA conferences may be targeted at some of the very same competencies and SKAs. Finally, and most importantly, the mentoring of VHA nurse executives by those currently in executive positions will be enhanced through the documentation of critical competencies and SKAs.

Additionally, this information can be utilized by the American College of Health Care Executives to plan and develop professional educational conferences directed to their executive nurse members. Seventy six percent of all current nurse executive respondents were affiliated with the College. The future nurse executives have only a fourteen percent membership. This group represents the future leadership in the VHA nurse executive community and there exists an opportunity for marketing by ACHE and current VHA leadership on the importance of professional affiliation in an administration-focused organization. By utilizing the information from this study to target these members, ACHE will be better equipped to meet the education needs of this subset and further reach out to new potential members through targeted educational opportunities and networking.

The challenges faced by nurse executives continue to shape the career field and the care delivery for veterans. The VA exists to care for veterans and it is well documented that nurses are the most integral members of this care delivery team. As the healthcare environment changes, so must the response of its leaders. The results of this study are critically important given the context of current and anticipated trends in nursing and issues associated with career development in the Department of Veterans Affairs.

Limitations

Although the 48.6% response rate from the VHA nurse executives in the previous study is sufficient based on previous research, less than half of nurse executives did not provide input (Appendix D). In research dependent on questionnaires, the possibility of nonresponse bias is a limitation that must be considered when interpreting results. It is possible that the non-respondents could have provided additional insight, yet it is unlikely that their responses would dramatically alter the results of this research in light of the high rate of agreement among the individuals who did respond to the questionnaire. Due to the fact that over half of participants did not respond, it is possible that the demographics and perceptions of this group are different from those of the population of VHA nurse executives as a whole. However, demographic and educational background data are not available and thus a direct comparison with this cohort is not possible.

Another possible limitation is the exclusion of nurses throughout the system that are not currently in leadership positions. While obtaining input from this group would provide valuable information on their perceptions, the exclusion of this group was intentional because these individuals have not been exposed to traditional nursing leadership positions and the focus was on nurses at the mid-manager level. Because this group (future nurse executives) will be assuming the roles of nurse executives in the next 5-10 years, it was believed important to evaluate the difference in perceptions between this group and the current nurse executives.

Conclusion

The Department of Veterans Affairs is one of this country's largest employers of nursing personnel. As the role of the executive nurse continues to evolve, it is critical to evaluate the differing perceptions on critical competencies between current and future nurse executives. This study compared the perceptions of current to future nurse executives on the competencies and the

accompanying skills, knowledge, and abilities (SKAs) Veterans Health Administration (VHA) nurse executives will require in the future to be successful.

Based on the data presented here, results show no significant differences between the overall ratings of the two groups and the null hypothesis is accepted, Ho_1: There is no difference between group membership. For hypothesis two, the results indicate that all the respondents in the study, on average, could differentiate among the items and the means of items are not the same making the differences within items statistically significant. We therefore reject the null hypothesis and accept the alternate, H_{a2}: there is a difference importance of each SKA within specific domains. For the third hypothesis, results indicate that both groups rated the items in the same pattern and agreed on highly rated items and also agreed on low rated items in the same way. Additionally, the F test failed to achieve significance so the null hypothesis associated with interaction is accepted, Ho_3: There is no difference between the ratings of specific SKAs between groups to overall group rating patterns.

<div align="center">Recommendations</div>

To ensure successful succession planning, VHA must ensure that future nurse executives possess the technical skills required to be successful in the future nursing executive environment. Very interestingly, the average age difference between current and future nurse executives is very slight (four years). This further highlights the importance and significance of the current nursing shortage. Individuals identified as potential future nurse executives approaching retirement age at or slightly behind the current nurse executives highlights the importance of recruiting and training individuals with significant time left in their career progression to ensure there is not a leadership gap. Further research is warranted on nurses very junior in their career to assess their perceptions and intentions on pursuing the nurse executive role.

Table 1. Summary of Demographic Data for Department of Veterans Affairs Nurse Respondents[a]

Variable	Future Respondents (n=102)		Current Respondents (n=58)	
	Mean ± SD	No. (1%)	Mean ± SD	No. (1%)
Age, years	50.14 ± 6.57	-	53.71 ± 5.21	-
Experience				
Clinical	20.88 ± 9.11	-	26.93 ± 9.98	-
Administrative	11.09 ± 7.91	-	*	-
Sex				
Male	-	8 (7.7)	-	4 (6.90)
Female	-	96 (92.3)	-	54 (93.10)
Professional Affiliation				
ACHE	-	15 (14.4)	-	44.08 (76.0)
Other	-	70 (67.3)	-	*
Degree Obtained[b]				
Bachelor (non nursing related)	10 (9.6)		-	2 (3.4)
Bachelor (nursing related)	55 (52.9)		-	34 (58.6)
Masters (non nursing related)	23 (22.1)		-	14 (24.1)
Masters (nursing related)	68 (65.4)		-	45 (77.6)
Doctorate (non nursing related)	5 (4.8)		-	4 (6.9)
Doctorate (nursing related)	5 (4.8)		-	4 (6.9)
Medical Degree	1 (1.0)		-	0 (0)
Other	0 (0)		-	3 (5.1)

SD = standard deviation
[a] Total sample consisted of 162 VHA nurses
[b] Categories are not exclusive
* not reported

Table 2. Skills, Knowledge, and Abilities (SKA) Item Rating Reliability Coefficients

Domain	No. of SKA Items Rated	Cronbach α		
		Future Respondents (n= 102)	Current Respondents (n=58)	All Respondents (n=160)
Organizational Stewardship	18	.86	.88	.87
Interpersonal Effectiveness	12	.79	.84	.80
Systems Thinking	20	.90	.90	.90
Technical Skills	13	.91	.85	.89
Creative Thinking	13	.87	.86	.87
Flexibility/Adaptability	11	.88	.87	.87
Customer Service	6	.84	.79	.82
Personal Mastery	7	.80	.75	.78

Responses were recorded on a 7-point rating scale, with 1 = unimportant to 7= extremely important

Table 3. Two Most Important SKA Item Averages by Domain for VHA Nurse Executive Groups

Domain	Future Respondents (n=102) SKA Item	Mean ± SD[a]	Current Respondents (n=58) SKA Item	total = 160 Mean ± SD[a]
Organizational Stewardship	1.9 – Ability to collaborate	6.56 ± .62	1.9 – Ability to collaborate	6.52 ± .66
	1.13 – Ability to allocate resources and develop programs	6.34 ± .81	1.13 – Ability to allocate resources and develop programs	6.45 ± .65
Interpersonal Effectiveness	2.3 – Conflict resolution skills	6.59 ± .60	2.3 – Conflict resolution skills	6.64 ± .55
	2.8 – Ability to see all sides of an issue	6.47 ± .71	2.2 – Effective speaking skills	6.45 ± .71
Systems Thinking	3.5 – Ability to lead change	6.69 ± .54	3.5 – Ability to lead change	6.66 ± .58
	3.17 - Creation of opportunities for staff development	6.45± .79	3.6 – High level of emotional intelligence	6.45 ± .71
Technical Skills	4.8 – Ability to project staffing needs and overtime requirement	6.37 ± .84	4.8 – Ability to project staffing needs and overtime requirement	6.52 ± .63
	4.11 – Analytical thinking through outcome measuring	6.35 ± .81	4.11 – Analytical thinking through outcome measuring	6.40 ± .75
Creative Thinking	5.6 – Integrity and ethical conduct	6.76 ± .51	5.6 – Integrity and ethical conduct	6.71 ± .59
	5.4 – Openness to new ideas	6.58 ± .64	5.4 – Openness to new ideas	6.55 ± .60
Flexibility/ Adaptability	6.10 – Ability to develop/maintain work environments attractive to nurses	6.66 ± .57	6.10 – Ability to develop/maintain work environments attractive to nurses	6.62 ± .59
	6.1 – Conflict management skills	6.60 ± .65	6.1 – Conflict management skills	6.57 ± .70
Customer Service	7.5 – Ability to continuously learn	6.73 ± .49	7.5 – Ability to continuously learn	6.69 ± .47
	7.4 – Skill in linking clinical outcomes to staffing	6.62 ± 0.61	7.4 – Skill in linking clinical outcomes to staffing	6.66 ± .66
Personal Mastery	8.4 – Ethical decision making	6.77 ± .49	8.4 – Ethical decision making ability	6.79 ± .49
	8.3 – Ability to perform honest self critique	6.57 ± .69	8.3 – Ability to perform honest self critique	6.55 ± .73

VHA = Veterans Health Administration; SD = standard deviation; SKA = skills, knowledge, and abilities
[a] Seven-point relative importance scale, where 1 = extremely unimportant and 7 = extremely important

Table 4. ANOVA Summary – Mean Differences in Item Ratings

Domain / Effect Sources	SS (Subtotals)	SS (Totals)	df	MS	F	P
1. Organizational Stewardship						
Between subjects	-	881.764	(161)	-	-	-
Nurse group (G)	.991	-	1	.991	.180	NS
Residual between subjects	880.773	-	160	5.505	-	-
Within subjects	-	2332.087	(2754)			
n = 18 items (I)	388.362	-	17	22.845	32.098	<.001
Interaction G x I	7.827	-	17	.460	.647	NS
Residual within subjects	1935.898	-	2720	.712	-	-
Total	-	3213.851	(2915)			
2. Interpersonal Effectiveness						
Between subjects	-	380.144	(161)	-	-	-
Nurse group (G)	.000	-	1	.000	.000	NS
Residual between subjects	380.144	-	160	2.376	-	-
Within subjects	-	946.867	(1782)	-	-	-
n = 12 items (I)	164.450	-	11	14.950	33.685	<.001
Interaction G x I	1.297	-	11	.118	.266	NS
Residual within subjects	781.120	-	1760	.444	-	-
Total	-	1327.011	(1943)			
3. Systems Thinking						
Between subjects	-	883.848	(161)	-	-	-
Nurse group (G)	.013	-	1	.013	.002	NS
Residual between subjects	883.835	-	160	5.524		
Within subjects	-	2175.980	(3078)	-	-	
n = 20 items (I)	490.735	-	19	25.828	46.756	<.001
Interaction G x I	5.937	-	19	.312	.566	NS
Residual within subjects	1679.308	-	3040	.552	-	-
Total	-	3059.828	(3239)	-		
4. Technical Skills						
Between subjects	-	736.962	(161)	-	-	-
Nurse group (G)	1.751	-	1	1.751	.381	NS
Residual between subjects	735.211		160	4.595	-	-
Within subjects	-	1699.444	(1944)	-	-	-
n = 13 items (I)	634.251	-	12	52.854	95.888	<.001
Interaction G x I	6.876	-	12	.573	1.039	NS
Residual within subjects	1058.317	-	1920	.416	-	-
Total	-	2436.406	(2105)	-	-	-
5. Creative Thinking						
Between subjects	-	481.479	(161)	-	-	-
Nurse group (G)	.010	-	1	.010	.003	NS
Residual between subjects	481.469	-	160	3.009	-	-
Within subjects	-	1169.168	(1944)	-	-	-
n = 13 items (I)	368.611	-	12	30.718	73.834	.<.001
Interaction G x I	1.762	-	12	.147	.353	NS
Residual within subjects	798.795 -	-	1920	.416	-	-
Total	-	1650.647	(2105)	-	-	-

Domain / Effect Sources	SS (Subtotals)	SS (Totals)	df	MS	F	P
6. Flexibility / Adaptability						
Between subjects	-	703.182	(161)	-	-	-
Nurse group (G)	.099	-	1	.099	.022	NS
Residual between subjects	703.083	-	160	4.394	-	-
Within subjects	-	1279.069	(1944)	-	-	
n = 11 items (I)	408.256	-	12	40.826	75.239	<.001
Interaction G x I	2.635	-	12	.263	.486	NS
Residual within subjects	868.178	-	1920	.543	-	-
Total	-	1982.251	(2105)			
7. Customer Service						
Between subjects	-	265.667	(161)	-	-	-
Nurse group (G)	.657	-	1	.657	.396	NS
Residual between subjects	265.010	-	160	1.656	-	-
Within subjects	-	295.688	(810)			
n = 6 items (I)	24.416	-	5	4.883	14.433	<.001
Interaction G x I	.609	-	5	.122	.360	NS
Residual within subjects	270.663	-	800	.338	-	-
Total	-	561.355	(971)			
8. Personal Mastery						
Between subjects	-	292.843	161	-	-	-
Nurse group (G)	.270	-	1	.207	.113	NS
Residual between subjects	292.573	-	160	1.829	-	-
Within subjects	-	614.538	(972)			
n = 7 items (I)	180.157	-	6	30.026	66.417	<.001
Interaction G x I	.380	-	6	.063	.140	NS
Residual within subjects	434.001	-	960	.452	-	-
Total	-	907.381	(1133)			

ANOVA = analysis of variance; df = degrees of freedom; MS = mean squares; NS = not statistically significant; SS = sum of squares

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Appendix A: Letter from VHA Chief Nursing Officer

DEPARTMENT OF **VETERANS AFFAIRS**

Veterans Health Administration
Washington DC 20420 In Reply Refer To:

October 15, 2005

Dear Nurse Leader,

The Nurse Executive role in the Veterans Health Administration is vital to ensuring the organization's success. As current leaders in the VHA Nursing Community, I would like to invite you to participate in a research project aimed at rating nurse executive competencies. This study will identify the importance of competencies required by nurse executives in the Department of Veteran's Affairs as well as act as a guide in the development of educational programs for future and current nurse executives. The research results will be shared with you in the future.

Please take a few minutes of your time to complete the Delphi questionnaire that you can access on the following website: www.baylor2006.com. Click on the *Nursing Delphi* button to prompt you to the research and data collect screen and then click on the *nurse executive competencies* box. You need to use the following id: username: *executive* and password: *delphi*. This questionnaire is part of a research effort endorsed by the Office of Nursing Services in collaboration with qualified researchers from the U.S. Army-Baylor University Graduate Program in Health Care Administration. The study entitled "Executive Skills: VA Nurse Competencies," seeks to identify the competencies required for VHA nurse executives.

The study fact sheet and questionnaire are located on the website mentioned above. Your responses will be confidential. At no time will individual responses be identified.

If you have any questions regarding this study, please call Natalie Sutto, Principal Investigator at (210) 930-6361 or email her at natalie.sutto@med.va.gov. Your assistance in this research project is appreciated.

Sincerely,

Cathy Rick, RN, CNAA, FACHE
Chief Nursing Officer, Office of Nursing Services

Appendix B: Instructions

Background Information

The role of the nurse executive is rapidly changing in response to the changing healthcare environment. Nursing shortages, rising costs, and increasing numbers of complex healthcare situations will continue to shape the role of the nurse executive. To meet these challenges, nurse executives must identify the requisite competencies required to ensure the organization's overall success. This project is being conducted in conjunction with the Veterans Health Administration and the U.S. Army-Baylor University Graduate Program in Health Care Administration, to identify competencies facing nurse executives over the next five to ten years. This research will further describe the skill, knowledge, and ability requirements that current experts expect will be needed to be successful in rapidly changing healthcare environment.

How long will it take?

It will take approximately 20-30 minutes to respond to this questionnaire. The first questionnaire, completed in December 2004, resulted in field generated competencies that were subsequently clustered into domains by an Expert Panel. This second and final questionnaire requires respondents to consider a group of questions using numeric ratings. Respondents have two weeks to complete the questionnaire via this website or print and mail the questionnaire.

Methods

This is not a survey! This study employs the Delphi Method to collect and describe the opinions of expert respondents. The RAND Corporation initially developed it as a means of effectively and efficiently eliciting expert group judgments. Respondents are not required to travel or complete any advance reading. The Delphi method has three hallmarks:

1.   Expert opinion is elicited through the use of an anonymous questionnaire;

2.   Interaction among respondents is accomplished at each round by synthesizing all responses, informing each respondent of the group's current position, and redistributing the questionnaire results for further consideration; and

3.   The group generally achieves a consensus after a few rounds.

Individual Utility of Results

Through their participation, experts will play a vital role in the determination of new directions for nurse executive competencies. Feedback will be provided after completion questionnaire. Experts should find it an interesting forecast into the future and an opportunity to respond to the collective ideas of the panel. At study completion, each participant will receive a summary report of the results.

How will the results be used?

Compiled results from this study may be used in several ways:

1. Knowledge of these results will better prepare current nursing leaders in their task of mentoring upcoming nurse executives;

2. Future nurse executives may identify their personal strength and weakness areas in order to plan their own self-improvement;

3. Education and training courses can be modified to more fully address the requisite skills, knowledge, and abilities required by future executives;

4. Using these findings, comparisons can be made between current and future nurse executive skills and those results reported for other professions; and

5. The results may be published in a professional journal.

Appendix C: Questionnaire

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Appendix D: Results from Independent Study

Running Head: EXECUTIVE COMPETENCIES OF NURSES

Executive Competencies of Nurses in the Veterans Health Administration

Natalie B. Sutto, BSN, MBA, CHE*

U.S. Department of Veterans Affairs

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Disclaimer: The opinions expressed herein by the authors are strictly their own and do not reflect the official policy or position of the U.S. Department of Veterans Affairs, the Department of the Navy, Department of the Army, the Department of Defense, the U.S. Government, nor Baylor University.

Acknowledgements

Executive Summary

This study identifies the competencies current Veterans Health Administration (VHA) nurse executives will require in the future and defines the accompanying skills, knowledge, and abilities (SKAs) required to successfully execute the identified competencies. This study tests the hypothesis: H_{a1} = There are very real differences among competencies identified by the nurse executives in the Veterans Administration. H_{a2} = There are very real differences among skills, knowledge, and abilities (SKAs) identified by the nurse executives in the Veterans Administration. H_{o1} = There are no differences among competencies identified by the nurse executives in the Veterans Administration. H_{o2} = There are no differences among skills, knowledge, and abilities (SKAs) identified by the nurse executives in the Veterans Administration.

Utilizing the Delphi method for executive decision-making, 144 directors of nursing within the VHA in the grades of GS-14 to Senior Executive Service identified the five top competencies believed to be necessary for nurse executives and the SKAs essential to achieve those competencies. An expert panel sorted the individual competencies into the eight core domains of the VHA High Performance Development Model (HPDM). Subsequently, the executive respondents rated the previously identified SKAs on a 7-point bipolar scale according to their perceived importance of the SKA to the future performance by the nurse executive. Response rates were 34% and 48.2% for Delphi rounds 1 and 2, respectively. The first round generated 245 unique competencies required for VHA nurse executives. The core competency domains were, in order of frequency from highest to lowest: organizational stewardship, interpersonal effectiveness, systems thinking, technical skills, creative thinking, flexibility/adaptability, customer service, and personal mastery. In the second round, the SKAs

rated as most important by nurse executives involved ethical conduct and decision-making, abilities to continuously learn and lead, and staffing and conflict resolution skills. Competencies and SKAs from nurse executives in the field appear to be congruent with the HPDM. Outcomes from the competency list generated in the field are expected to be useful for nurse executive self-assessment and for professional development. Additionally, identification of specific SKAs can provide a means for developing job requirements and career performance criteria at a behavioral task level and can assist in identifying needs for continuing education.

Executive Competencies of Nurses in the Veterans Health Administration

This research effort was an attempt to further define the role of the Veterans Health Administration (VHA) nurse executive. The objectives were to identify and verify competencies that current executive nurses will need in the future and to define the skills, knowledge, and abilities (SKAs) needed to address those competencies. Skills are the technical expertise, knowledge is the possession of facts and principles, and abilities encompass the physical, mental, or legal power (Hudak, Brook, Finstuen, and Riley 1993).

Introduction

The Veterans Health Administration is one of three administrations within the Department of Veterans Affairs (VA) and is the largest integrated health system in the United States. The VA was established in 1930 and enhanced in 1944 following World War II through the Servicemen's Readjustment Act of 1944. It was elevated to Cabinet status in 1989 and at that time became the Department of Veterans Affairs (Perlin, Kolodner, and Roswell 2004).

Review of the Literature

The importance of healthcare administration to the overall quality of a healthcare organization was emphasized on a national level during the 1990s. Congress gave the Agency for Healthcare Research and Quality (AHRQ) a mandate to report annually about health care quality (Lighter and Fair, 2004). The National Healthcare Quality Report (NHQR) includes a broad set of performance measures used to monitor the nation's progress toward improved health care quality and it discusses the status of healthcare administration in the United States. The success of a healthcare organization is dependent on the quality of its direct patient care staff and its executives. Those individuals are trained in a variety of educational programs that teach the competencies and associated SKAs individuals need to be successful executives. Therefore,

competency and SKA identification (forecasting) must be conducted to develop quality training and educational programs for healthcare executives.

A review of the literature regarding civilian nurse executives suggests that nurse leaders must be competent in business, leadership, and communication skills (Lighter et al 2004; O'Leary and O'Leary 1999; Sandford 1994). The competencies identified as important were based on anecdotal information received from interviews with nurse executives. The literature also demonstrates that there are different views of how nurse executives should be educated (Sanford 1994). According to Sanford (1994), 33% of chief executive officers (CEOs) prefer their chief nurse executives to have a masters of science in nursing, 40% wanted to hire people with masters in healthcare administration, and 25% thought the masters in business administration was the ideal degree.

While the literature review yielded many qualitative articles regarding civilian nurse executives, there appears to be a scarcity of empirically based nursing executive competency research. There is, however, substantive literature of quantitative research regarding more generalized nursing, allied health, healthcare, education and research priorities (Bowles 1999; American College of Healthcare Executives 1984; American College of Healthcare Executives 1987; American College of Healthcare Executives 1991; Richie, Tagliareni, and Schmitt 1979). Much of this research has employed the RAND corporation's Delphi technique (Helmer 1967; Dalkey 1969).

Research specific to executive competencies in healthcare has been the primary focus of a variety of investigations conducted by personnel of the Army-Baylor University Graduate Program in Healthcare Administration (Ehrat 2001; Fink, Kosecoff, Chassin, and Brook 1984; Finstuen and Mangelsdorfff 2005; and Hasson, Keeney, and McKenna 2000). This body of

work, which employs several iterations of executive group decision-making, and which is sometimes referred to as the Hudak Methodology, consists of a stream of tailored executive research studies based, in part, on the RAND corporation's Delphi technique (Griffith, Warden, Neighbors, and Shim 2002). One recent Army-Baylor University Healthcare Administration executive competency (ABEC) study, commissioned by American Pharmacists Association (APhA) in conjunction with the University of Pennsylvania's Wharton school, identified executive pharmacy leadership skills, knowledge and abilities for a group of graduates from the GlaxoSmithKline executive management program for pharmacy leaders (Meadows, Maine, Keyes, Pearson, and Finstuen 2005); another recent study employed the technology for the identification of radiographic and computer needs among a national sample of military and civilian subject matter experts (Rothfuss, Chaffin, Luciano, Finstuen, and Mangelsdorff 2005). Hudak and colleagues reviewed six ABEC studies and identified the competencies that are critical to the success of healthcare executives (Hudak et al 1993). These competencies included cost-finance, leadership, and ethics (Hudak et al 1993). Top rated SKAs include: management, human relations, and building and maintaining trust when making difficult decisions. (Calhoun, Davidson, Sinioris, Vincent, and Griffith 2002).

Although the ABEC studies have identified competencies at the executive level in several healthcare career fields in both the Department of Defense (DoD) and the civilian sectors (e.g. administrators, physicians, dentists, pharmacists, etc.), to date there has been limited studies charting nurse executive competencies (Duperrior 1995; Duperroir and Finstuen 1996). Duperroir and Finstuen concluded that a firm understanding of leadership, managed care, business management, staffing management, quality management, licensure and education, and ethics are vital to the success of the nurse executive. The skills, knowledge, and abilities (SKAs)

required of successful military nurse executives included vision, competence in strategic management, ability to work in a multidisciplinary environment, and knowledge of finance, quantitative and communication skills. Nurse executives were found to be visionary leaders who ensure that the department of nursing and its staff are able to deal with the rapid changes that occur in the constantly changing healthcare environment.

Current information concerning executive competencies of VHA nurses included a High Performance Development Model (HPDM) currently in development by the VHA staff office (VHA Staff 2002). The model consists of eight core competencies: organizational stewardship, interpersonal effectiveness, systems thinking, technical skills, creative thinking, flexibility/adaptability, customer service, and personal mastery. A goal of this study was to verify these eight core competencies and further amplify and elaborate upon specific competencies elicited from executives in the field regarding specific skills, knowledge, and abilities associated with desirable VHA executive level nurse performance needed for success during the next five to ten years.

Methods

Delphi Round 1 – Competencies

Study respondents were chosen based on demonstrated achievement and expertise within the VHA. Executives currently holding positions as Chief Nurse, Directors of Clinical Operations, and Directors of Nursing for VHA hospitals and hospital systems were determined to be the optimal individuals to identify essential competencies and related SKAs for the nurse executive role. The aforementioned positions are obtained by meeting strict hiring criteria through competitive selection boards. Additionally, these individuals receive extensive training in organizational leadership. The range of civilian grades and years of VHA experience within

this study are GS-14 to Senior Executive Service (SES), top tiers within the U.S. Civil Service and Federal Employee Systems.

The study consisted of two iterations of the Delphi method for executive decision-making separated by content analysis by an expert panel. The RAND Corporation developed the Delphi method to establish priorities and predict future trends (Dalkey 1969). Respondents were asked to identify five competencies believed to be essential for performance by nurse executives within the next 5-10 years; they were also asked to identify the SKAs necessary to attain the competencies. This information, intended to form a composite of job requirements, was obtained though a web-based questionnaire.

This questionnaire allowed individuals separated by geography to expediently communicate their views. Additionally, it ensured the anonymity of the respondents. The original information was sent to all participants via electronic mail with an attachment containing the project website address. All participants were given a username and password to gain access to the questionnaire, therefore assuring selected participant participation in questionnaire completion. Competencies and SKAs identified could be deemed controversial and an atmosphere of nonattribution was essential for obtaining accurate information.

Forty-nine of 144 nurse executives responded, for a response rate of 34%. All initial responses were consolidated and evaluated for key phrases. From these responses, the investigators identified 245 total competencies. After combining like-worded competencies, the investigators grouped key phrases and calculated frequencies. The researchers then grouped these competency items into a preliminary draft list of competencies, which was presented to the expert panel of nurses and used as a beginning point for discussion.

Analysis of Competencies – Domains

The next step was the convening of the expert panel consisting of the Chief Nursing

Officer of the Veterans Health Administration, a U.S. Navy nurse executive, a VHA nurse

executive, a VHA administrator, and a civilian nurse executive. All five individuals were key

leaders within their field and recognized as experts. Together they represented over 140 years of

nursing and administrative experience.

The five expert panel members reviewed the competencies identified during round 1 of

the Delphi, sorted the 245 competencies into domains by content. To aid the expert panel in

grouping of items, titles of the core competencies from the VHA's HPDM were used to assign

names to the content domains. The expert panel rank-ordered the domains one through eight by

frequency of competencies assigned to the domain. Additionally, the expert panel added six

additional competencies for a total of 251. Domains, or core competencies, were rank-ordered

by frequencies as follows: (1) Organizational Stewardship, (2) Interpersonal Effectiveness, (3)

Systems Thinking, (4) Technical Skills, (5) Creative Thinking, (6) Flexibility/Adaptability, (7)

Customer Service, and (8) Personal Mastery. Rank-ordering was accomplished by using the

computed frequency of response and the percentage of the 251 competencies within domains as

displayed in Table 1. As shown, percentages of unique competencies ranged from 19 percent for

the Organizational Stewardship domain to 4 percent for Personal Mastery within the eight

domains. Frequency analyses showed that the Organizational Stewardship domain included

almost one fifth of the competencies, with particular emphasis on corporate accountability,

resource management, and succession planning.

Delphi Round 2 – SKA Ratings

For round 2, the skills, knowledge, and abilities (SKA) associated with the 251

competencies were consolidated into 100 SKA statements by the research team. The original

group of 144 nurse executives were sent electronic mail messages directing them to the web-based application of the structured questionnaires and they were asked to rate their individual perception of the importance (on a 7-point scale with end points of 1 = unimportant and 7 = important) of the SKAs for each expert panel rank-ordered content domain. Fifty-eight of 144 nurse executives returned ratings for a response rate of 48.2% percent, which is considered acceptable (Richie et al 1979).

Round 2 data included a request for demographic and background information. Of the 58 respondents, he minimum age was 41 years, the maximum age was 65 years and average age was 54 years old. Female respondents totaled 54 (93 percent). Years of clinical experience ranged from 8 to 49 years, with average experience of 29 years and a total cumulative number of clinical years for all respondents of 1,562 years. The educational demographics of the 58 respondents included two nurse executives (3 percent) with non-healthcare bachelors' degrees, 34 (59 percent) with healthcare-related bachelors' degrees. Fourteen (24 percent) had non-healthcare related masters' degrees, and 45 (75 percent) of the respondents reported healthcare-related masters' degrees. Eight individuals had earned doctorates, four of which were healthcare-related and four are non-healthcare related. Seventy-six percent of respondents were members of the American College of Healthcare Executives.

All SKA ratings were analyzed for the degree of nurse executive rater agreement within each of the eight domains. Cronbach's coefficient alpha was used to determine inter-rater reliability. The Statistical Package for the Social Sciences (SPSS) version 12 computer software was used to evaluate the data. Reliability indices ranged from .75 for the Personal Mastery domain to .90 for the Systems Thinking domain. All obtained reliability results exceeded the recommended and acceptable level of .70 (Nunnally 2005). The overall coefficient alpha

obtained .97 for the 100 SKA items indicated that the SKA item means within domain categories were stable and, therefore, reflected a high level of agreement among the nurse executive raters.

Overall, SKA items were generally rated as being highly important. In total, 60 of the 100 total SKAs had average ratings equal to, or above, a rating scale of 6.0. On the 7-point importance rating scale used, average SKA ratings ranged from 4.47 to 6.79. Table 2 shows the descriptive statistics for the top four rated SKA items within each HPDM nurse executive content domain. The highest rated SKA items in the eight domains exhibited averages of 6.79 for "Ethical Decision-Making Ability" within the content domain of Personal Mastery and 6.71 for "Integrity and Ethical Conduct" within the content domain of Creative Thinking. Among the top four SKAs in each of the eight domains, all fell at or above 6.1 on the 7 point bipolar rating scale with 1 = unimportant and 7 = important.

Table 3 shows the means and the standard deviations for the top ten rated SKAs, regardless of domain. The most highly rated SKAs fall into six domains – Personal Mastery, Creative Thinking, Flexibility/Adaptability, Systems Thinking, and Interpersonal Effectiveness. Rater agreement is again reflected by inspection of rating standard deviations; none was greater than .73 rating scale points.

In contrast, Table 4 displays the means and standard deviations for the bottom ten rated SKAs in all domains; all ratings were less than 5.3 on the 7-point relative importance rating scale. The lowest rated SKA was "Conceptual knowledge of LAN, WAN, and wireless networks" from the Technical Skills domain with an average rating of 4.47. The domain with the greatest number of low ranking SKAs was the Organizational Stewardship domain which contained three of the bottom ten rated SKAs. Compared to the top rated SKAs, the standard deviations of ratings for low rated SKAs were generally larger than the standard deviations

shown in Table 3, indicative of more variability and interpreted as showing less agreement among respondents.

In summary, results, rank-ordered by item within content domains and overall, suggested that the most important rated SKAs centered on ethics, continuous learning, change, clinical outcomes, conflict resolution, interpersonal skills, openness to new ideas, and performance of honest self-critique. According to Delphi methodological iterative procedures, preliminary results of this feedback were provided to all the nurse executives.

Discussion

Concerns of nurse executives regarding necessary competencies for success in the next 5 to 10 years appear to be driven by essential health services managerial competencies concerned with traditional administrative and management activities. The two most highly rated SKAs both involved ethics, a trend not as heavily emphasized in the ABEC studies or other literature on executive skills. However, the importance of ethics in the business setting is well noted. The remaining highest competencies are well dispersed among domains. Similar to other executive skills studies in the literature, personnel skills dominated the highest rated SKAs. The abilities to relate, collaborate, and interact with staff and other professionals, were rated very highly as were the abilities to change and to manage conflict. These findings emphasize and affirm the role of traditional executive leadership functions for successful executives of the future.

The importance of these findings in the VHA underscores the primary difference between the federal system and the civilian sector. Most, if not all, VHA nurse executives are trained and grown from within the system rather than hired-in from outside agencies. Because of this, it is all the more imperative that junior nurse executives and potential job candidates obtain competencies and associated SKAs through academic preparation and experiential training

tailored to the systems where they will experience their professional development, promotions, and career progression.

The VHA currently utilizes the High Performance Development Model, which identifies eight core competencies necessary for nurse executives. This study has further enhanced, verified, and discerned to be viable by specifying an array of supporting, underpinning competencies from senior VHA nurse executives in the field. The core competencies of the model have been prioritized herein and ranked by frequencies as operationally defined by the expert panel and the specified underpinning field generated competencies have been prioritized within the core competencies by rated importance as expressed by the senior VHA nurse executives.

The results of this study may have a profound impact on the future of VHA executive nursing. After this assessment of essential nurse executive competencies, nurse executives may integrate these results into educational and professional development programs. Outcomes from the competency list are expected to be useful for mentoring, self-assessment, and professional development. They should augment and clarify the relative importance of components contained in the draft HPDM. Formal professional development of nurse executives may be modified to include instruction and training on many of the SKAs generated from this study. Specific SKAs can provide a means for developing job requirements and career performance criteria at a behavioral task level, and can contribute information for identifying continuing education and professional conference topical needs. Continuing education programming at annual VHA conferences may be targeted at some of the very same competencies and SKAs. Finally, and most importantly, the mentoring of VHA nurse executives by those currently in executive positions will be enhanced through the documentation of critical competencies and SKAs.

Additionally, this information can be utilized by the American College of Health Care Executives to plan and develop professional educational conferences directed to their executive nurse members. Seventy six percent of all respondents were affiliated with the College. By utilizing the information from this study to target these members, ACHE will be better equipped to meet the education needs of this subset and further reach out to new potential members through targeted educational opportunities and networking.

References

See main reference list.

Table D1. VA Nurse Executive Panel High Performance Development Model Content Domains, Frequency Counts of Individual Competencies, Domain Totals, and Unique Competencies from Round 1.

Nurse Executive Competencies within Content Domains	n		n	Total n	%	Unique n	%
Organizational Stewardship				47	19.00	16	17.00
Corporate Accountability	9	Business Acumen	1				
Resource Management	9	Community Partnership	1				
Succession Planning	7	Ethics / Legal	1				
Organizational Stewardship	4	Financial Management	1				
Training	4	Magnate Culture	1				
Policy	2	Peer Review	1				
Politics	2	Technical	1				
Vision	2	Values	1				
Interpersonal Effectiveness				45	18.00	11	12.00
Union	11	Team Building	2				
Interpersonal Skills	8	Workforce Development	2				
Multi-Disciplinary Skill	8	Interpersonal Relations	1				
Communication Skills	6	Organizational Skills	1				
Conflict Management	3	Quality	1				
Negotiations	2						
Systems Thinking				40	16.00	18	20.00
	8	Ethics / Legal	1				

Strategic Planning							
Evidenced Based Practice	5	Maximizing Funding	1				
Information Systems	5	Multi-Disciplinary Skills	1				
Community Partnership	3	Performance Measures	1				
Human Resource Management	3	Policy	1				
Quality Administrative	2	Process Modeling	1				
	1	Regulatory	1				
Business Acumen	1	VA Authorities	1				
Cost Control	1						
Technical Skills				35	14.00	12	13.00
Budgeting	9	Contract Management	1				
Information Management	8	Funding Sources	1				
Equipment	3	Labor Management Rules	1				
Financial Skills	3	Negotiations	1				
Practice	3	Professional Development	1				
Regulatory	3	Title 5&38 Rules and Regs	1				
Creative Thinking				29	12.00	12	13.00
Retain and Recruit	6	Technical Innovation	2				
Creativity	4	Conceptual Skills	1				
General Leadership	4	Delivery Systems	1				
Workforce Planning	4	Evidence Based Systems	1				
Community Partnership	2	Risk Taking	1				
	2	Technical	1				

Research

Flexibility / Adaptability				28	11.00	10	11.00
Retain and Recruit	6	Resource Constraints	2				
Staff Management	6	Business Acumen	1				
Change Management	4	Community Partnership	1				
Financial Management	3	Non-Traditional Structure	1				
Flexibility	3	Program Management	1				

Customer Service				16	6.00	5	5.00
Safety	6	Satisfaction	2				
Patient Centered	4	Training	1				
Quality	3						

Personal Mastery				11	4.00	8	9.00
Emotional Intelligence	3	Professional Development	1				
Balance	2	Recognition	1				
Personal Ethics	1	Self-Development	1				
Principle Centered	1	Time Management	1				

Table D2: Top Four Rated Skill, Knowledge, and Ability (SKA) Items by HPDM Content Domain

SKA Items within Preceptor Content Domains	Mean	S.D.	Reliability Coefficient
Organizational Stewardship (18 SKA Items)			.88
Ability to collaborate	6.52	.66	
Ability to allocate resources and develop programs	6.45	.65	
Ability to balance cost and quality	6.28	.77	
Identify, groom, and coach candidates for executive positions	6.16	.81	
Interpersonal Effectiveness (12 SKA Items)			.84
Conflict resolution skills	6.64	.55	
Effective speaking skills	6.43	.68	
Ability to see all sides of an issue	6.41	.77	
Develop and communicate common vision	6.40	.77	
Systems Thinking (20 SKA Items)			.90
Ability to lead change	6.66	.58	
High level of emotional intelligence	6.45	.71	
Ability to think outside the box	6.36	.79	
Ability to engage staff in planning for better buy-in	6.24	.71	

Technical Skills (13 SKA Items)		.85
Ability to project staffing needs and overtime requirements	6.52	.63
Analytical thinking through outcome measuring	6.40	.75
Ability to distill data into meaningful trend information	6.33	.60
Knowledge and application of quality indices and		
benchmarking	6.10	.74
Creative Thinking (13 SKA Items)		.86
Integrity and ethical conduct	6.71	.59
Openness to new ideas	6.55	.60
Ability to forecast key staffing needs	6.53	.65
Ability to visualize and communicate organizational vision	6.47	.63
Flexibility/Adaptability (11 SKA Items)		.87
Ability to develop/maintain work environments attractive to		
nurses	6.62	.59
Conflict management skills	6.57	.70
Ability to constructively use rewards/awards	6.43	.96
Ability to develop creative solutions for staffing solutions and		
shift flexibility	6.38	.75
Customer Service (6 SKA Items)		.79
Ability to continuously learn	6.69	.47
Skill in linking clinical outcomes to staffing	6.66	.66
Skill in educating nurses to empower nurses	6.40	.79

Skill in using pertinent satisfaction data to improve care	6.36	.79
Personal Mastery (7 SKA Items)			.75
Ethical decision making ability	6.79	.49
Ability to perform honest self critique	6.55	.73
Ability to stay the course until goals are met	6.53	.65
Role modeling for future healthcare leaders	6.45	.68

Note: A total of 100 SKA items were rated by the VA Nurse Executive Delphi network, the bottom 10 rated SKAs, based on a 7-point bipolar adjective importance rating scale which ranged from 1 = unimportant, to 7 = important, are listed above.

Table D3: Rank Order of Top Ten Rated SKA Items Regardless of Domain

SKA Item	Mean	S.D.	Domain
Ethical decision making ability	6.79	.49	Personal Mastery
Integrity and ethical conduct	6.71	.59	Creative Thinking
Ability to continuously learn	6.69	.47	Customer Service
Ability to lead change	6.66	.58	Systems Thinking
Skill in linking clinical outcomes to staffing	6.66	.66	Customer Service
Conflict resolution skills	6.64	.55	Interpersonal Effect.
Ability to develop/maintain work environments attractive to nurses	6.62	.59	Flexibility / Adaptability
Conflict management skills	6.57	.70	Flexibility / Adaptability
Openness to new ideas	6.55	.60	Creative Thinking
Ability to perform honest self critique	6.55	.73	Personal Mastery

Note: A total of 100 SKA items were rated by the VA Nurse Executive Delphi network, the top 10 rated SKAs, based on a 7-point bipolar adjective importance rating scale which ranged from 1 = unimportant, to 7 = important, are listed above.

Table D4: Rank Order of Bottom Ten Rated SKA Items Regardless of Domain

SKA Item	Mean	S.D.	Domain
Knowledge and application of return on investments methodologies	5.29	1.09	Flexibility / Adaptability
Ability to influence public policy and policy making	5.29	1.09	Organizational Stewardship
Knowledge and application of basic marketing and available tools	5.22	1.12	Flexibility/Adaptability
Practicing good follower ship principles	5.21	1.32	Organizational Stewardship
Establish computerization for confidential documentation	5.16	1.20	Systems Thinking
Participation in nationwide cost control efforts	5.07	1.23	Organizational Stewardship
Participation in VA research activities	4.95	0.98	Creative Thinking
Knowledge of differences between various VA architectures	4.93	1.24	Systems Thinking
Contract technical review skills	4.60	0.95	Technical Skills
Conceptual knowledge of LAN, WAN, and wireless networks	4.47	1.40	Technical Skills

Note: A total of 100 SKA items were rated by the VA Nurse Executive Delphi network, the bottom 10 rated SKAs, based on a 7-point bipolar adjective importance rating scale which ranged from 1 = unimportant, to 7 = important, are listed above.

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14. ABSTRACT

This study determines if current and future nurse executives differ in their perceptions of the skills, knowledge, and abilities (SKAs) required to be successful in the role of nurse executive within the Veterans Health Administration (VHA). Using the Delphi method for executive decision-making, 144 current nurse executives, as well as 168 nurses identified for potential selection to this position judged the relative importance of SKAs using a scale with 1 = unimportant to 7 = important. The main outcome measures are the main effects of group membership (current versus future nurse executives), differences among items within eight specific domains, and assessment of potential interaction effects for the dependent variable of SKA item importance ratings. The results include no main effects for overall rating differences between the current and future nurse executive groups were found for any of the eight domains; however, statistically significant and systematic within-main-effect differences were detected for SKA items in all domains. The importance ratings given SKAs in the eight domains were highly similar between the two groups.

15. SUBJECT TERMS

SKA - skills, knowledge, and abilities
ANOVA - analysis of variance

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