The Perceived Value of Certification in Nonsurgical Pain Management

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Chronic pain is a growing epidemic in America. Challenges in patients' access to care, and in reimbursement to Certified Registered Nurse Anesthetists (CRNAs) who provide pain services, have resulted in a voluntary subspecialty certification in nonsurgical pain management (NSPM) for CRNAs. An evaluation was conducted of perceptions of CRNAs toward the value of certification in NSPM. An invitation to complete the Perceived Value of Certification Tool (PVCT) was sent to 474 CRNAs who identified the subspecialty practice of NSPM upon application for recertification to the NBCRNA. Data were collected on 18 factors related to the perceived value of certification in the NSPM subspecialty. Exploratory factor analysis using principal components analysis with varimax rotation was conducted to assess the latent structure of the PVCT and to identify potential constructs of CRNAs' perceptions. Reliability was assessed using Cronbach α coefficients. Of 64 CRNAs who provided data, a 3-factor solution emerged that explained 72.25% of the overall variance: personal satisfaction, professional recognition, and competence, each with excellent to good reliability (F1: $\alpha = 0.95$, F2: $\alpha = 0.94$, F3: $\alpha = 0.88$). Identification of the 3 constructs in this study will assist with future efforts of examination validation for the subspecialty of NSPM certification for CRNAs.

Keywords: Certification, chronic pain, nonsurgical pain management, perceived value of certification, validation.

Chronic pain is a problem affecting more than 100 million adults in America, with associated costs being close to $635 billion annually in treatment and lost productivity.[1] In 2010, the Health and Human Services was directed by the *Patient Protection and Affordable Care Act* to enlist the Institute of Medicine (IOM, now called the Health and Medicine Division) of the National Academies to examine pain as a public health problem.[1] In 2011, the IOM released its findings in the report *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research*. In this report, the IOM addressed the state of the science in pain research, care, and education. As a result, a cultural transformation was recommended to address 4 nationwide challenges: pain as a public health challenge, pain care, education, and research.[1] Recommendations to address the public health challenges of pain include improving the collection and reporting of data on pain and the creation of a comprehensive population health-level strategy for pain prevention, treatment, management, and research to account for differences in the experience of pain among population groups, including environmental factors that contribute to the consequences of pain. This recommendation of the report is directed specifically to populations that are disproportionately affected by and undertreated for pain to include people of lower socioeconomic status, racial and ethnic minorities, women, children, elderly individuals, military veterans, and people with terminal illnesses.[1]

Second, findings and recommendations in regard to pain care include addressing the barriers that healthcare providers face in the healthcare setting. These barriers include the need for enhanced continuing education and training for healthcare professionals to address gaps in knowledge and competencies to assess and manage pain. Other barriers include certain provider attitudes toward pain, which often impede delivery of high-quality care, along with the need for training. Geographic barriers also exist for residents of rural communities, who often lack access to pain care, putting them at a major disadvantage. In addition, regulatory and institutional barriers exist that obstruct patient-centered care because of reimbursement policies that vary from institution to institution.[1]

The last 2 findings in the IOM report address the challenges associated with education and research in understanding the underpinnings of chronic pain. Educational challenges exist not only with patients to help them better understand pain and its causes, but also professional education about pain. Recommendations for education include the expansion of educational programs to patients, the public, and providers; an improved curriculum and education for healthcare professionals; and an increase in the number of health professionals with advanced expertise in pain care.[1] To assist in educational

efforts, research recommendations include the designation of an institute at the National Institutes of Health to lead efforts in the advancement of pain research. Furthermore, support for a pain consortium was recommended by the IOM, whose mission would be to move pain research forward by taking steps to improve the process for reviewing grant proposals related to pain, working with pain advocacy and awareness organizations, and working to expand partnerships between academia and entities that foster research, education, and treatment of pain.[1]

• *Development of Nonsurgical Pain Management Credential.* Certified Registered Nurse Anesthetists (CRNAs) have provided chronic pain care services for years, performing less complex procedures such as trigger point injections and interlaminar epidural steroid injections, to the more complex, involving radiologic imaging for the performance of sacroiliac joint injections and ablative procedures.[2] Chronic pain care practice encompasses comprehensive services dealing with patient assessment, pharmacologic treatment, complex interventional strategies, imaging, and follow-up.[3,4] This care has come to be known as *nonsurgical pain management* (NSPM) and is defined as "the administration of neural, or neuraxial blockade, physiological, pharmacological, and psychological techniques and modalities for the management of acute and chronic pain outside the obstetrical and operating room areas".[3]

Based on patient, provider, and facility needs, CRNAs practice NSPM in a variety of practice model settings, including multidisciplinary teams or as sole providers.[2] However, CRNAs throughout the country have faced institutional barriers regarding reimbursement, one of the challenges identified by the IOM.[3] In addition, in what has become known as an opioid crisis in America, it is clear that chronic pain is too often mismanaged, often masked with prescriptions to powerful opioids, whereas integrative approaches with the appropriate combination of drugs and nonpharmacologic methods such as NSPM are grossly underutilized.[4]

Regulatory and institutional barriers faced by CRNAs who provide NSPM services were brought to the forefront of national attention in 2012. At that time, reimbursement for NSPM services provided by CRNAs was abruptly ceased by the Centers for Medicare & Medicaid Services (CMS).[3] All CRNAs who rendered NSPM care and submitted requests for payment using *Current Procedural Terminology* (CPT) codes related to NSPM were denied reimbursement by CMS.[3,5] Across the country, CRNAs rallied to preserve patients' access to chronic pain management services administered by CRNAs through the Protect My Pain Care Campaign.[5] The American Association of Nurse Anesthetists (AANA), the Council on Accreditation of Nurse Anesthesia Educational Programs, and the National Board of Certification and Recertification for Nurse Anesthetists (NBCRNA) collaborated and successfully appealed this decision by CMS. Reimbursement was reinstated to CRNAs for NSPM services; however, in alignment with the IOM's recommendation regarding *education* for healthcare professionals who practice chronic pain care and the need for an increase in the number of healthcare professionals who possess *advanced expertise* in pain care, the need for subspecialty certification in NSPM became readily apparent. Certification validates that a practitioner has the knowledge and skills necessary for competent practice and demonstrates to legislators, regulatory agencies, and the public that CRNAs are competent to safely practice the nurse anesthesia subspecialty of NSPM.[3]

Subspecialty certification, such as that for NSPM, focuses on a narrow field of study within the specialty of nurse anesthesia,[3] with the intent of validating knowledge based on competency standards. Competency standards are established through a professional practice analysis, which is required in development of professional certification tests and aims to gather the most current practice information from subject matter experts in the field.[6] The professional practice analysis thereby establishes the content validity of an examination and serves as the primary link between the test and clinical practice.[6] A professional practice analysis was conducted by the NBCRNA in 2010 (updated in 2014) to identify content areas, knowledge, and tasks associated with the role of a CRNA who practices in the subspecialty of NSPM.[3] In 2013, the foundational elements of the NSPM certification program were developed by experts in the field of NSPM.[2] With use of the Delphi method, criteria were developed to initially qualify for the NSPM credential and centered on 3 tools for competency assessment in NSPM subspecialty certification: demonstration of technical skills, peer review/quality assessment, and a written examination. Of these 3 tools, the written examination ranked highest, with agreement among 87.5% of the expert panel that a written examination was appropriate or somewhat appropriate.[2] Authors concluded that a valid competency evaluation for demonstration of knowledge and clinical skills was necessary to maintain credibility of the certification.

• *Subspecialty Certification in Nursing.* The American Board of Nursing Specialties (ABNS) defines *certification* as "the formal recognition of the specialized knowledge, skills, and experience demonstrated by the achievement of standards identified by a nursing specialty to promote optimal health outcomes".[7] The mission of the ABNS is to "promote the value of specialty nursing certification to all stakeholders"[7]; The Institute for Credentialing Excellence defines *stakeholders* as "the various groups with an interest in the quality, governance, and operation of a certification program, such as the public, certificants, candidates, employers, customers, clients, and third party payers".[6]

Specific to advanced practice nursing, subspecialty certification is awarded by the American Nurses Credentialing Center to nurse practitioners in the areas of Family, Adult-Gerontology Primary Care, Adult-Gerontology Acute Care, Psychiatric-Mental Health, Pediatric Primary Care, and Emergency.[8] Subspecialty certification for clinical nurse specialists includes the following: Adult Health, Adult-Gerontology, Adult-Psychiatric Mental Health, Child-Adolescent Psychiatric Mental Health, and Pediatric.[8] There are currently no subspecialty certifications for certified nurse midwives,[9] and CRNAs can now be awarded the option of the NSPM subspecialty certification (NSPM-C) by the NBCRNA.[3]

• *Perceived Value of Certification Tool.* Perceptions of nurses toward certification in respective specialties was first assessed by the Competency and Credentialing Institute in 2001.[10] As a result of that study, the Perceived Value of Certification Tool (PVCT) was developed and piloted in 2003 to a sample of 400 perioperative nurses.[11] After a 61% return rate on the survey, psychometric analysis was excellent and theoretically consistent with prior published literature on certification in nursing.[11] Later that year, the ABNS became the first organization to use the PVCT in a multiorganizational survey to identify the value of nursing specialty certification, as well as to identify incentives and barriers to certification.[10] Since 2003, the PVCT has been used in 17 studies with more than 25,000 respondents in various nursing and advance practice nursing disciplines, including hospital-based perioperative nurses, public health nurses, pediatric nurses, office-based nurses, and nursing administrators.[12-19]

A stable factor structure and reliability of the PVCT has been identified in several psychometric studies.[11,13,14] Gaberson et al[11] identified 3 factors in the perceived value of certification: *personal value, recognition by others,* and *professional practice.* Sechrist et al[13] identified a simpler factor structure with subscales of the factors labeled intrinsic and extrinsic. A third psychometric study by Sechrist and Berlin compared the 3-factor and 2-factor solutions and concluded that the intrinsic and extrinsic factors were identical to the previous study by Sechrist et al.[14] In addition, the factor structure was stable across certified and noncertified nurses, as well as nurse administrators. Confirmatory factor analysis applied in the third study validated the 2-factor model among a sample of 2,323 registered nurse respondents (954 certified, 675 noncertified, and 694 administrators) and revealed an acceptable fit for the data (root mean square error of approximation = 0.057, confirmatory fit index = 0.97, adjusted goodness-of-fit index = 0.98.[14])

Since inception of the NSPM subspecialty certification (NSPM-C), more than 40 CRNAs have been granted the certification.[3] To date, perceptions of certified and non-certified CRNAs toward the value of the voluntary NSPM certification have not been examined. The purpose of this study was to explore CRNAs' perceptions of the value of certification in the nurse anesthesia subspecialty of NSPM in an effort to identify the benefits of NSPM certification in addition to bridging the gap of potential barriers associated with NSPM certification.

Materials and Methods

This descriptive, exploratory study was conducted by means of the PVCT in a nonprobability convenience sample of CRNAs who identified the subspecialty practice of NSPM on their application for recertification and met the inclusion criteria for the study. Following permission for use of the PVCT from the Competency and Credentialing Institute in June 2016, along with IRB approval in October 2016, preparation for electronic survey delivery was designed in collaboration with a single NBCRNA non-CRNA staff member, a single NBCRNA *CRNA* staff member, and a single Competency and Credentialing Institute staff member. Survey dissemination was conducted during March and April 2017.

• *Survey Description.* The PVCT is a survey instrument developed and validated by the Competency and Credentialing Institute in 2003 and consists of an 18-item, 5-point Likert-style questionnaire of intrinsic and extrinsic subscales. Intrinsic factors are related to motivators internal to an individual and linked to personal development, whereas extrinsic factors are external to an individual and defined by others. Inclusion criteria for the study included the following: (1) unrestricted licensure as a registered nurse and advanced practice registered nurse, as applicable with individual state nurse practice acts; (2) current, full recertification as a CRNA; (3) at least 2 years of current nurse anesthesia experience; and (4) affirmative selection of NSPM (as defined in the *NSPM Handbook*) on the NBCRNA recertification application for the active subspecialty practice of NSPM. Exclusion criteria included CRNAs who possess a probationary recertification status and CRNAs who do not claim NSPM practice on their NBCRNA recertification application.

Demographic questions were added to the survey by the primary investigator to ascertain the year of initial CRNA certification; years practicing NSPM; practice location in the categories of rural/critical access *or* urban setting; the number of annual procedures performed to include trigger point injections, epidural steroid injections, sacroiliac joint injections, and ablative procedures; and if the respondent had experienced any billing issues such as difficulty obtaining reimbursement in his or her NSPM practice (Table 1).

• *Sample.* The identification of CRNAs who claimed NSPM as a subspecialty was undertaken by the NBCRNA CRNA staff member by reviewing records of CRNAs who claimed NSPM on their recertification application; the primary investigator and coinvestigators were blinded to all identifying information. The identification of

Variable	Category	Number (%)
Year initially certified as a CRNA	1960-1970	0 (0)
	1971-1980	11 (17.2)
	1981-1990	15 (23.4)
	1991-2000	25 (39.1)
	2001-2010	13 (20.3)
	2011-2017	0 (0)
Years practicing NSPM	1-30 years	56 (87.5)
	> 30 years	8 (12.5)
Setting for majority of NSPM practice	Rural or critical access	36 (56.3)
	Urban	28 (44.8)
	Missing	0 (0)
Number of procedures performed annually		
Trigger point injections	< 10	18 (28.1)
	11-25	8 (12.1)
	26-100	0 (0)
	> 100	23 (35.9)
	Missing	15 (23.4)
Epidural steroid injections	< 10	10 (15.6)
	11-25	4 (6.3)
	26-100	0 (0)
	> 100	37 (57.8)
	Missing	13 (20.3)
Sacroiliac joint injections	< 10	17 (26.6)
	11-25	6 (9.4)
	26-100	0 (0)
	> 100	26 (40.6)
	Missing	15 (23.4)
Ablative procedures	< 10	40 (62.5)
	11-25	3 (4.7)
	26-100	0 (0)
	> 100	14 (21.9)
	Missing	7 (10.9)
Have you experienced any billing issues, such as difficulty obtaining reimbursement in your NSPM practice?	Yes	34 (53.1)
	No	30 (46.9)

Table 1. Demographics of Survey Respondents (N = 64)
Abbreviations: CRNA, Certified Registered Nurse Anesthetist; NSPM, nonsurgical pain management.

CRNAs who practice NSPM is possible because, during the recertification application process to the NBCRNA, CRNAs must attest to practice hours during the prior 2-year period, at which time the applicant is given the opportunity to report a corresponding specialty practice from an NBCRNA-defined drop-down list. The specialties in this list include cardiac, neurosurgery, obstetrics, NSPM, pediatrics, orthopedics, and gastrointestinal/endoscopy. Those who claimed NSPM in the drop-down list were identified by the NBCRNA CRNA staff member as potential participants in the study. To meet the inclusion

criteria, the NBCRNA CRNA staff member conducted a "cleaning" process. Records were sorted according to a unique person identification number. Records were then examined and deleted in the following manner: (1) place of practice was examined and 1 entry for each unique practice location was initially retained; (2) records were deleted if the practice location contained any of the following terms: *digestive, gastrointestinal, endoscopy, gastroenterology, infertility, in vitro fertilization,* or *planned parenthood*; (3) records were deleted if the person was known to be deceased according to the

NBCRNA database, if the person worked at a corporation in a nonclinical capacity, the person was not recertified, or if he or she held an AANA member status of "Inactive" or "Emeritus". In addition, records with practice location names containing terms such as *eye center, dental, periodontal, women's health,* or *vein center* were deleted. In an effort to further narrow the survey participants to a representative sample of CRNAs who actually practiced in the subspecialty of NSPM, the survey began with a single question: "Does any aspect of your current practice include NSPM, defined as "the administration of neural or neuraxial blockade, physiological, pharmacological, and psychological techniques and modalities for the management of acute and chronic pain *outside the obstetrical and operating room areas*?" Those who answered "yes" were taken to the survey; however, in those who answered "no", the participant was thanked for volunteering to participate in the survey, and the survey was ended at that time; therefore, no relevant data were collected from that participant.

The final sample consisted of 492 unique records, including AANA members and nonmembers, representing 46 states and territories. Initial certification year ranged from 1958 to 2014 with 100% holding the NBCRNA status of "recertified". Words that were unique in the practice location name consisted of 185 records containing the word *pain*, 23 containing the word *interventional*, and 29 records containing the word *spine*.

Electronic survey delivery was accomplished in collaboration with an NBCRNA staff member using the NBCRNA's Information Technology management service who supplied a secure link to the survey. This non-CRNA NBCRNA staff member linked participant names along with contact information for each participant, for the purposes of survey dissemination. The survey was launched via email to 492 potential participants in March 2017. Because of email address changes and/or those with blocked receipt of emails, there were 18 email invitations returned as undeliverable. A total of 474 potential participants were therefore contacted to participate. Two reminder emails were sent at the 2- and 4-week marks. Researchers were blinded to all identifiable information on the returned surveys to protect survey participants' privacy and anonymity. On receipt of the completed surveys, the non-CRNA NBCRNA staff member attached an identification number to the survey for purposes of data management and maintained the data in a secure NBCRNA database protected with a password. Data were then shared by the NBCRNA with the Competency and Credentialing Institute staff member, where it was collated and maintained in Institute databases, secured with a password, and shared with the principal investigator.

• *Data Analysis.* Data were analyzed using a statistical analysis software program (SPSS 23.0, IBM SPSS). Descriptive statistics were calculated on the demographic questions for each interval and ratio variable using frequencies and percentages (see Table 1). Items were scored on a Likert scale as follows: 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. The category of "no opinion" was treated as a missing value. Exploratory factor analysis with varimax rotation was conducted on the 18-item PVCT to assess the latent structure of the PVCT and to identify potential constructs of CRNAs' perceptions of the perceived value of certification for CRNAs who practice NSPM. Reliability for the 3 identified constructs was then assessed using Cronbach α coefficients.

Results

A total of 127 participants opened the survey, and 64 completed the survey to provide usable data (response rate, 13.5%). Twenty-six participants provided partial data, which were not used in the final analysis; 35 participants answered "no" to the initial survey question regarding his or her practice involving NSPM outside the obstetric and operating room areas; therefore, the survey was closed to them at that point. Descriptive statistics of the sample are presented in Table 1. The highest number of respondents, 25 (39.1%) of 64, were initially certified as a CRNA between 1991 and 2000 with the lowest, 11 (17.2%) being initially certified between 1971 and 1980. Fifty-six (87.5%) responded as having 1 to 30 years of clinical practice in the subspecialty of NSPM. Of the sample, 56.3% (n = 36) responded as having most of his or her NSPM practice in a rural or critical access setting, and 44.8% (n = 28) in an urban setting. Of the NSPM procedures done on an annual basis, the most common NSPM procedure was epidural steroid injections at 57.8% (n = 37) and more than 100 procedures annually; the least common was ablative procedures, with respondents reporting fewer than 10 annually, 62.5% (n = 40). In the category of billing issues such as difficulty obtaining reimbursement, 53.1% (n = 34) reported "yes", and 46.9% (n = 30) reported having none.

Table 2 shows means and standard deviations based on the responses of the 64 CRNAs. Scores on the items ranged from 1 to 4, according to the following scale: 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. The highest-rated items (above a mean of 3.00) were "enhances feeling of personal accomplishment" (3.54), "validates specialized knowledge" (3.46), "provides evidence of professional commitment" (3.46), "provides personal satisfaction" (3.46), "enhances professional credibility" (3.44), "provides professional challenge" (3.44), and "indicates professional growth" (3.44). There were no items that scored less than 2.00 (disagree). The lowest scoring item was "increases salary" (2.59).

Initially, the factorability of the 18-item PVCT was examined. Several well-recognized criteria for the factorability of a correlation were used. First, it was observed

Variable	Mean (SD)
Enhances feeling of personal accomplishment	3.54 (0.67)
Provides evidence of professional commitment	3.46 (0.70)
Validates specialized knowledge	3.46 (0.67)
Provides personal satisfaction	3.46 (0.65)
Provides professional challenge	3.44 (0.70)
Enhances professional credibility	3.44 (0.74)
Indicates professional growth	3.44 (0.70)
Increases marketability	3.38 (0.76)
Promotes recognition from peers	3.38 (0.76)
Promotes recognition from employers	3.31 (0.79)
Indicates attainment of a practice standard	3.30 (0.76)
Provides evidence of accountability	3.25 (0.83)
Promotes recognition from other health professionals	3.21 (0.76)
Increases consumer confidence	3.15 (0.89)
Enhances personal confidence in clinical abilities	3.13 (0.78)
Enhances professional autonomy	3.03 (0.84)
Indicates level of clinical competence	2.90 (0.87)
Increases salary	2.59 (0.76)

Table 2. Means and Standard Deviations of 64 CRNAs' Scores on PVCT[a]
Abbreviations: CRNA, Certified Registered Nurse Anesthetist; PVCT, Perceived Value of Certification Tool.
[a]N = 64 for each variable. Higher scores indicate a more favorable perception of certification; lower scores indicate a less favorable perception.

that 18 of 18 items correlated at least 0.3 with at least one other item, suggesting reasonable factorability. Second, the Kaiser-Meyer-Olkin measure of sampling adequacy was 0.879, above the commonly recommended value of 0.6, and the Bartlett test of sphericity was significant: χ^2 (df = 153) = 1,123.19; $P < .01$). Finally, the communalities were all above 0.3 (Table 3), further confirming that each item shared some common variance with other items. Given these overall indicators, factor analysis was deemed to be suitable with all 18 items.

An exploratory factor analysis using principal components analysis with varimax rotation was performed to identify the relationship between the 18 measured variables of the PVCT and to determine the potential underlying latent constructs. After rotation, values greater than 1.0 yielded a 3-factor solution for the constructs: personal satisfaction, professional recognition, and competence. This 3-factor solution accounted for 72.25% of the total variance of the data. The highest factor loadings after extraction were "promotes recognition from employers" (0.933), "provides personal satisfaction" (0.879), "provides professional challenge" (0.838), and "promotes recognition from other health professionals" (0.805; see Table 3). The item "increases salary" did not load well on any of the 3 constructs.

Cronbach α coefficients for reliability were calculated for the following constructs: personal satisfaction, professional recognition, and competence. The items for personal satisfaction and professional recognition had

Cronbach α coefficients of 0.95 and 0.94, respectively, indicating excellent reliability. The items for competence had a Cronbach α coefficient of 0.88, indicating good reliability. Table 4 presents the descriptive statistics of the constructs, between-factor correlations, and results of the reliability analysis.

Discussion
The findings of this study elucidated the perceived benefits of holding the NSPM credential and identified 3 important constructs: personal satisfaction, professional recognition, and competence. The 4 highest factor loadings of "promotes recognition from employers", "provides personal satisfaction", "provides professional challenge", and "promotes recognition from other health professionals" are noteworthy in that these are evenly divided between intrinsic and extrinsic factors, all of which loaded with excellent reliability on 2 constructs elucidated by this study: personal satisfaction and professional recognition. The intrinsic factors of "provides professional challenge" and "provides personal satisfaction" are noted to be rewards that are internal to an individual and linked to personal development. The extrinsic factors of "promotes recognition from employers" and "promotes recognition from other health professionals" are rewards that are external to a person and defined by others.[15] Bekemeier[19] identified that extrinsic rewards are the driving force behind nurses deciding to become certified.

The extrinsic reward of attainment of the NSPM

Value statement	Personal satisfaction	Professional recognition	Competence	Communality
Validates specialized knowledge	0.297	0.340	0.744	.758
Indicates level of clinical competence	0.346	0.112	0.637	.537
Indicates attainment of a practice standard	0.307	0.278	0.711	.676
Enhances professional credibility	0.269	0.573	0.597	.757
Promotes recognition from peers	0.278	0.644	0.507	.750
Promotes recognition from other health professionals	0.348	0.805	0.189	.806
Promotes recognition from employers	0.279	0.933	0.109	.960
Increases consumer confidence	0.236	0.761	0.309	.731
Increases marketability	0.283	0.663	0.483	.753
Enhances feeling of personal accomplishment	0.797	0.297	0.252	.788
Enhances personal confidence in clinical abilities	0.690	0.152	0.428	.682
Provides personal satisfaction	0.879	0.318	0.215	.920
Provides professional challenge	0.838	0.235	0.264	.827
Enhances professional autonomy	0.578	0.305	0.396	.584
Indicates professional growth	0.750	0.346	0.294	.769
Provides evidence of professional commitment	0.590	0.337	0.553	.768
Provides evidence of accountability	0.537	0.303	0.472	.602
Increases salary	0.361	0.343	0.298	.337

Table 3. Rotated Factor Loadings for Individual Value Statements

Scale	Number of items	Mean (SD)	Cronbach α	Between-factor correlations Personal satisfaction	Professional recognition
Personal satisfaction	8	3.29 (0.63)	0.95		
Professional recognition	5	3.29 (0.65)	0.94	0.778	
Competence	4	3.25 (0.66)	0.88	0.779	0.681

Table 4. Descriptive Statistics and Reliability for Perceived Value of Certification Tool Factors (N = 65)

subspecialty certification is an aspect of recognition for which the foundations of this credential were developed. CRNA experts practicing in the subspecialty of NSPM identified the need for a valid competency evaluation to maintain credibility to stakeholders of CRNAs' competence in the practice of NSPM. Furthermore, with the evolving opportunities for fellowships in NSPM for CRNAs in the United States, attainment of the NSPM credential operationalizes the rigorous aspects of NSPM within the nurse anesthesia profession.

Four factors in this study loaded with good reliability on the construct of competence: "validates specialized knowledge", "indicates level of clinical competence", "indicates attainment of a practice standard", and "enhances professional credibility". The latent construct of competence cannot be measured by any one tool but rather by multifactorial assessments that have been identified as the standards for successful completion of the NSPM credential.

This study demonstrates that one potential barrier associated with NSPM certification is increased salary due to holding the NSPM credential. Similar to other studies using the PVCT, "increased salary" was rated the least perceived value, with a mean score of 2.59, and it did not load on any of the 3 identified constructs.

One limitation to this study is the low response rate to the electronic survey, which questions the generalizability of the sample to the target population. Since the dissemination of the survey in 2016, the number of CRNAs who have certified in NSPM has nearly tripled from 15 to 41 (6% of those identified as practicing in the subspecialty of NSPM).[3] This may be attributed to a broader awareness of the NSPM credential and increased desire to obtain it; therefore, future studies may improve the external validity of the perceived value of certification in CRNAs who practice NSPM. In addition, at the time of survey dissemination, CRNAs may have been reluctant to answer if they did not hold the credential themselves or did not perceive the survey as useful. A second limitation is that the demographics aspect of the survey was designed by the researcher, and for the sake of brevity and limitation of re-

spondent fatigue, the demographic questions were somewhat limited. The questions on the survey that pertained to the number of procedures performed annually is only one very limited aspect of what NSPM practitioners do on an everyday basis with patients experiencing chronic pain. Therefore, there is some element of subjectivity on the part of what was asked on the survey in terms of demographics. This in itself may have dissuaded respondents from continuing further to the actual PVCT elements of the survey. Finally, complex issues and opinions of those who practice NSPM were limited by the straightforward aspect of the survey in the form of Likert-style questions. This limits the open-ended opinions of the respondents, which could potentially have value in further understanding the perceptions of these very specialized practitioners within the nurse anesthesia profession.

Findings of this study compare favorably with previous studies examining the perceptions of nurses in various specialties in that value is placed in certification.[11,13,14,16-19] Results also aligned with the perceived value of certification expressed by the ABNS study—that certification is perceived positively.[15] In addition, this study supports the need for certification in a subspecialty such as NSPM to validate CRNAs' expertise in chronic pain care services.

The identification of the 3 constructs, most particularly competence, provides important insight for future research toward validation of the NSPM credential. The emergence of competence as a primary construct in the perceived value of certification among NSPM practitioners assists with future efforts of validation to external stakeholders that CRNAs who practice NSPM undergo rigorous standards in which to attain the credential. The examination of latent constructs such as competence is best accomplished by a theoretical framework that validates competence from all aspects, not just basic knowledge. Although challenging, the rigor associated with attainment of this credential in the form of assessment on multiple levels, supports the IOM's directive to increase the number of health professionals with expertise in chronic pain care.

REFERENCES

1. Institute of Medicine. *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research.* Washington, DC: National Academies Press; 2011.
2. Wooden S, Docherty S, Plaus K, Kusek A, Vacchiano Exploration of specialty certification for nurse anesthetists: nonsurgical pain management as a test case. *Pain Manag Nurs.* 2013;15(4):789-797.
3. National Board of Certification and Recertification for Nurse Anesthetists (NBCRNA). Nonsurgical pain management. https://www.nbcrna.com/exams/nspm. Accessed December 21, 2017.
4. Jonas W. An integrative approach to managing chronic pain can help solve the opioid crisis. https://www.statnews.com/2017/10/31/chronic-pain-opioid-crisis/. Published October 31, 2017. Accessed December 21, 2017.
5. American Association of Nurse Anesthetists (AANA). Medicare agency rules in favor of patient access to CRNA care. https://www.aana.com/practice/state-law-and-practice/medicare-agency-rules-in-favor-of-patient-access-to-crna-care. Accessed December 21, 2017.
6. Knapp J, Anderson L, Wild C, eds. Job/practice analysis. *In Certifica-*
tion: The ICE Handbook. Washington, DC: Institute for Credentialing Excellence; 2009:123-148.
7. American Board of Nursing Specialties (ABNS). Promoting excellence in nursing certification. http://www.nursingcertification.org/. Accessed December 21, 2017.
8. American Nurses Credentialing Center (ANCC). Choose Your certification. http://www.nursecredentialing.org/certification.aspx. Accessed December 21, 2017.
9. American Midwifery Certification Board (AMCB). http://www.amcb-midwife.org/home2. Accessed December 21, 2017.
10. ABNS. American Board of Nursing Specialties specialty nursing certification: nurses' perceptions, values and behaviors. White paper. http://www.nursingcertification.org/resources/documents/research/white_paper_final_12_12_06.pdf. Published December 2006. Accessed February 24, 2018.
11. Gaberson KB, Schroeter K, Killen AR, Valentine WA. The perceived value of certification by certified perioperative nurses. *Nurs Outlook.* 2003;51(6):272-276.
12. Competency and Credentialing Institute. Research tools. http://www.cc-institute.org/research/research-tools. Accessed December 21, 2017.
13. Sechrist KR, Valentine W, Berlin LE. Perceived value of certification among certified, noncertified, and administrative perioperative nurses. *J Prof Nurs.* 2006;22(4):242-247.
14. Sechrist KR, Berlin LE. Psychometric analysis of the perceived value of certification tool (PVCT). *J Prof Nurs.* 2006:22(4):248-252.
15. Niebuhr B, Biel M. The value of specialty nursing certification. *Nurs Outlook.* 2007;55(4):176-181.
16. Messmer PR, Hill-Rodriguez D, Williams AR, Ernst ME, Tahmooressi J. Perceived value of national certification for pediatric nurses. *J Contin Educ Nurs.* 2011;42(9):421-432.
17. Brown CG, Murphy CM, Norton V, Baldwin PD, Ponto J. The value of oncology nursing certification. *Clin J Oncol Nurs.* 2010;14(6):E63-E69.
18. Biel M. Infusion nursing certification: identification of stakeholders and demonstration of the value of certification. *J Infus Nurs.* 2007;30(6):332-338.
19. Bekemeier B. Credentialing for public health nurses: personally valued … but not well recognized. *Public Health Nurs.* 2007;24(5):439-448.

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