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A Survey of Nurses Who Practice in Infertility Settings

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Design: A nonrandom convenience sample was used to obtain information about the educational level, clinical activities, knowledge base, and skills of nurses involved with in vitro fertilization.

Participants: Three hundred thirty-six returned surveys.

Results: The Wilcox rank sum test compared nurses in the private practice setting with those in hospital-based services. No differences were found with regard to educational level or perceived level of proficiency with regard to the practice setting or geographic location in the United States. Seventy-three percent of the respondents indicated their primary role was in direct patient care; 31% stated they had been active in artificial reproductive nursing less than 5 years. Graduate level education was not correlated with perceived level of expertise but did correlate with length of clinical experience in assisted reproductive nursing and with certification.

Conclusion: Assisted reproductive nursing currently does not meet the standards for classification as an advanced practice nursing group. Action to further the area of reproductive nursing to a specialty in nursing or an advanced practice level is worth consideration for this highly specialized and unique group of nurses. *JOGNN, 34,* 561-568; 2005. DOI: 10.1177/0884217505280278

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The birth of Louise Brown, the first in vitro fertilization infant, in 1978 (Steptoe & Edwards, 1978) and the establishment of the first clinic devoted to assisted reproductive technologies in 1980 (Brinsden, 1999) marked the advent of a new clinical specialty for the international nursing community. Technological advances in the management of human reproduction required nurses to develop unique skills and imposed increased responsibilities upon those nurses involved in the care of individuals undergoing assistance with conception. The evolution of fertility nursing, providing a highly developed and sophisticated service to women and couples facing challenges in conception, occurred without a specific advanced practice educational program, guidelines, or standards for care. The purpose of this investigation was twofold: first, to gather baseline data on the nurses who are currently providing care in this area, and second, to obtain documentation on the scope and clinical practice of nurses in assisted reproductive technology. Based on the finding from this survey, this article discusses the issue of whether or not the area of assisted reproductive nursing (ARN) can be considered a specialty or an advanced practice group.

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Literature Review

Early pioneers who implemented the role of infertility nursing did not have explicit core competencies for entry level and advanced practice or scope of practice specifications to guide them. Certification for nurses who worked in infertility clinics was offered from 1984 through 1995, but later it was eliminated from the emerging specialty. The reasons for discontinuing certification were not entirely clear. It was speculated that there was a lack of interest in the process; however, more definitive data have not been presented. The effects of certification on clinical practice for ARNs, the eradication of a certification procedure, and the resulting implications for clinical practice have not been thoroughly examined.

The American Society for Reproductive Medicine is a professional organization devoted to "the growth of knowledge and professional education in the specialty of infertility and reproductive endocrinology throughout the reproductive lifespan" (Nurses' Professional Group Bylaws). The society recognized infertility nursing as a subspecialty in October 1988 through the establishment of the Nurses Special Interest Group. The group later changed its name to the Nurses' Professional Group in 1994. Nurses' Professional Group membership in 2002, at the time data for this survey were collected, totaled 556. Nurses actively practicing in reproductive clinical areas may be hospital based, in private practice settings, or located on military bases.

Prior to 1960, competency and skill in any specialized area of nursing was primarily dependent upon experiential training. However, nursing in the United States underwent a metamorphosis in the 1960s with regard to educational preparation and guidelines for practice. The federal government's financial support for nursing promoted the development of graduate degree programs in a variety of specialized areas, extending the academic learning for specific roles beyond that of the generic baccalaureate level of education. With advanced educational preparation for several specialized practice areas, both external and internal regulatory requirements evolved. Regulation of practice was established by setting entry-level requirements, guidelines for expanding the scope of practice, uniform standards of practice, and certification requirements for several subspecialties such as midwifery. The advantage of such measures included providing minimal competence for public safety, recognition of excellence in the clinical area, and uniformity of specified skills within a selected focus. In addition, specific roles were clarified. Efforts were undertaken to distinguish the unique function of nurses from the medical model. Skill acquisition with the transition from novice to expert in the clinical arena was examined closely, and models of theoretical and practical knowledge in nursing expanded (Benner, 1984).

Historically, specialty areas in nursing emerged in an unplanned fashion, extending the boundaries of nursing through an unregulated delegation of activities by a physician to nurses. For example, in areas without medical residents, increased responsibility was entrusted to nurses who were directly involved in patient care. Residents are most often the primary recipients of the physician's delegated authority, yet in circumstances where residents are not available, expanded responsibilities are frequently passed on to the nurse. Through their clinical presence with the physician and patient, nurses gained a wealth of knowledge and highly developed skill. As a result, documentation of the nurse's actual role outside of traditional nursing boundaries increased. Legitimization and better preparation for various roles in nursing developed. Professional recognition and, in some cases, financial reimbursement, were enhanced. The role of ARN developed concurrently with the efforts made by the medical field in England to advance technology in the field of infertility, and the last two decades have evidenced a growth of nurses working in the infertility clinical area.

In 1990, the Royal College of Nursing/Fertility Nurses Group conducted an investigation of the specialized service in the United Kingdom. The study surveyed 100 infertility units, 50 that were part of the National Health Service and 50 that were among the private practice services in the United Kingdom. Findings indicated that the role of the infertility nurse was initially developed by the physician in charge of a particular unit and varied extensively across the units surveyed. The authors reported that the scope of practice of these nurses ranged from "chaperoning patients in gynaecology clinics to performing specialized procedures" (Barbar, 1997, p. 195). The researchers also noted that the nursing role appeared to be influenced by the type of funding supporting the infertility services. In the late 1990s, as experienced nurses in the United Kingdom became available, efforts to formalize guidelines for the scope of practice were undertaken following the results of a survey reported by Castledine, McGee, and Brown (1996). The information gleaned from the survey offered a description of the broad spectrum of responsibilities that had rapidly emerged during the late 1980s as assisted reproductive technology (ART) expanded. Nursing duties and professional titles were diverse. In addition, preparational experience varied widely for the role in ART clinical nursing. Following the publication of the results in 1996, nurses in the United Kingdom expressed a desire to have limits for safe practice set forth by a professional nursing body that would independently define and develop their role (Castledine et al., 1996).

The American Nurses Association (ANA) Social Policy Statement defines advanced practice nursing (APN) as a clinical practice area characterized by certain essential elements (Beitz, 2000). The key components identified are

specialization, expansion, and advancement. Specialization refers to the focused concentration within a specific area of nursing. Expansion refers to the acquisition of new technical skills integrated with theoretical knowledge that supports the autonomy of the individual in areas of practice that traditionally are in the medical area. Advancement includes both of the preceding elements and incorporates the synthesis of research-based knowledge as well as theoretical and practical information developed at the graduate level of education. Furthermore, according to ANA's Standard for Advanced Practice Nursing, nurses in advanced nursing practice demonstrate high levels of expertise in the implementation of the nursing process. Therefore, nurses are expected to use their skills with individuals, families, or communities with complex responses to actual or potential health problems.

According to the ANA, APN is differentiated from specialty nursing by the completion of a master's degree, extensive supervised practice during a formal graduate-level educational program, and ongoing clinical interaction or follow-up involvement with the client family or community of focus. Nurses in both categories may perform some of the same skills and carry out some of the same interventions; the APN requires a greater depth of knowledge and an increased complexity of skills and provides more comprehensive care (Beitz, 2000).

Currently, APN in the United States has evolved into four distinct roles: nurse anesthetist, certified nurse midwife, clinical nurse specialist, and nurse practitioner. Essential competencies common among the four distinct groups include critical thinking and analysis, clinical judgment and decision making, leadership and management, communication, problem solving, collaboration, education research program development, and clinical expertise in a select area (Davies & Hughes, 1995). Hickey, Ouimette, and Venegoni (1996) further recommended that an APN must also have advanced assessment skills, the ability to synthesize and analyze data, the advanced ability to apply nursing principles, the ability to provide expert guidance and teaching, and the ability to work with clients and their families as well as with other members of the health care team. Additionally, they cite management of health care status, research skills, recognition of practice limitations, use of abstract thinking and conceptualization, independent decision making, diagnostic and prescriptive privileges, and knowledge of when to consult and refer as essential elements of an advance practitioner.

The process for conferring advanced practice status to select nurses varies from state to state within the United States. The use of certification and credentialing are not always distinguished, yet efforts exist across the nation to ensure public safety in the four recognized APN roles. Specialty practice organizations, faculty groups, various certifying bodies, and task forces have all been involved with the efforts to define the scope of practice for the highly specialized nursing subspecialties that have emerged in the 21st century.

In an effort to keep abreast of unfolding medical technology, the emerging role of nurses in the infertility setting has developed so rapidly that efforts to define and describe the role have been limited. As with many other advanced nursing specialties, the role of infertility nurse was delegated by physicians. Among experienced practitioners, the expert clinical skill critical to patient safety has evolved over time. The American nursing community acknowledged the emergence of infertility nursing as a clinical specialty in 1985 with the publication of a supplement in the *Journal of Obstetrics, Gynecology, and Neonatal Nursing* devoted to nursing the infertile couple (Smith, 1985). Although recognition was given to the evolution of the new subspecialty, information was lacking on a formal definition of the core knowledge base, responsibilities, and daily activities of nurses who practice in this clinical area. The first infertility nursing textbook was later published in 1991 (Garner, 1991), offering nurses both theoretical and practical knowledge specific to their clinical area of practice and providing a basis for defining a core knowledge base.

Although it is clear that infertility nurses currently provide a wide range of highly specialized skills in settings across the country, it is not clear how these nurses will be recognized in clinical practice. Currently, infertility nursing is not considered an advanced nursing practice, and graduate-level curricula have neither been defined nor established in the university setting. The nursing specialties continue to be clarified within the nursing profession; however, the actual requirements are not legally or educationally identified as they are for APNs. Historically, *specialty practices* have not been exclusive to graduate-level providers but do require a certification process, which no longer exists for in vitro fertilization nurses. Without a certification process, those working in ART nursing do not meet the specifications for recognition as a specialty practitioner.

Methodology

Following institutional review board approval from the university, data collection was undertaken.

A survey design was used to gather information from the assisted reproductive segment of the nursing population. Members of the Nurses' Professional Group served as the core study population for this investigation. To further broaden the scope of the study, surveys were also sent to the nursing staff at every medical practice in the United States that performs ART.

Nurses from all settings across the United States were asked to provide information on the type of practice setting they worked in, their preparation for their role in the

clinical setting, and activities they engaged in when caring for patients. Additionally, nurses were asked what areas of knowledge were necessary to effectively provide care and perform their duties. Nurses were also asked to identify the professional activities they engaged in to maintain, expand, or improve their skills, and, finally, what future action would be most helpful in furthering the development of ARN. Nine hundred ninety-seven surveys were mailed out to the various sites with a cover letter and consent form. The population was self-selected by signing and returning both the consent form and survey.

Three members of the American Society for Reproductive Medicine with clinical expertise in related specialty areas and background in graduate-level education and research developed the survey instrument. The questionnaire had 69 items. One component focused on the demographics of the nurses and the practice setting. Education, clinical background, certification, and years of experiences both in nursing and in ARN were queried. Another section addressed the nurses' values with regard to professional and personal behaviors and activities believed to be vital to the practice of nursing with assisted reproductive clients. The items included both an open-ended and closed-ended question format. Internal content validity was established by an independent panel of experts in the field of ARN. The instrument was pretested with a sample population of members of the local professional group of nurses active in the field of reproductive health to evaluate validity. Modifications were made based on the information gleaned through this initial testing. The mailing was undertaken after the final form of the survey was approved. Participants were asked to return the survey within 6 weeks.

Confidentiality was maintained by asking members to not sign the survey form. All forms were coded for data entry and analysis. The signed consent forms were separated and secured from the survey data. Surveys were not retained for analysis if the consent form was not returned or not signed. Descriptive and inferential statistics were used to analyze data collected in 2002 from nurses in practice sites where assisted reproductive technology is preformed. Three hundred thirty-six returned survey forms met the criteria for inclusion in the study.

Results

Demographics

The respondents in this survey were representative of the geographic distribution of ART centers nationwide. The majority of surveys (56.9%) returned were from the northeast and central midwest states where the largest clusters of ART centers are located. Nurses who returned the survey materials were predominantly from private practice settings (63.4%). Nineteen percent (19.3%) were from hospital affiliates. University-based ARNs contributed 14.3% of the data, and less than 1% were from nurses in military institutions. When comparing the scope of practice with the characteristics of the individual nurse respondents, no differences were found. The majority of centers were located in metropolitan areas (51%), with 43.2% located in a suburban setting. An additional 4.5% of the respondents were from rural locations. Comparisons were made to assess both consistencies and differences in the clinical practice of nurses in the metropolitan settings and the suburban setting. No differences were found in the professional characteristics of the respondents or the clinical activities reported in their role as an ARN.

Education

Educational preparation of the respondents can be found in Table 1. Among the 336 nurses who returned the survey, 35% reported that they had completed a bachelor of science degree in nursing. Approximately 19% held a master of science degree in nursing, and 73 participants or 21.7% indicated they had completed a program as a nurse practitioner. Depending on the time frame for an individual nurse's post-RN education, some nurses may have completed a nurse practitioner program that did not require a master's degree. Thirty percent of those who were nurse practitioners did not have a graduate degree in nursing; however, 15% were prepared at the baccalaureate level. Thirty-nine, or 53.4%, had graduate-level preparation, including 2 doctorally prepared nurses. Respondents were asked to indicate all levels of education obtained, thus categories reported were not exclusive. Separate analysis was completed to determine the highest degree held by individual respondents in the nursing profession. Eight of the respondents identified LPN as their highest level of nursing education (see Table 1).

Among the respondents, 49.4% stated they had more than 20 years of experience in nursing; however, only 5.1% had 20 years or more in the field of reproductive endocrinology (RE) or ART. Thirty-one percent indicated they had less than 5 years experience in RE/ART nursing. The most commonly reported clinical practice background was obstetrical nursing, 58.3%, and gynecology, 50%. Additional reported clinical backgrounds experience can be found in Table 2.

Clinical Practice

Two hundred seventy-six of the nurses (82.1%) surveyed stated they were employed full time in their role. They indicated that their clientele were primarily infertility clients (97.8%); however, 22.3% of the nurses also provided early obstetrical care, 41.4% provided gynecological care, and 39.6% were involved in endocrinologic aspects of client care. More than 73% (n = 246) described their primary role as direct patient care. Another 22.6%

TABLE 1
Highest Level of Education in Nursing

Level	*Number of Participants*	*Percent of Total*
Licensed practical nurse	8	.02
Diploma nurse	58	.18
Associates degree nurse	80	.25
BSN	113	.35
MSN	61	.19
CNM	2	.01
PhD	4	.01
Total	326	

Note. BSN = bachelor of science in nursing; MSN = master of science in nursing; CNM = certified nurse-midwife; PhD = doctor of philosophy.

TABLE 2
Clinical Background

Background	*Number of Participants*	*Percent of Total*
Obstetric nursing	196	58.3
Gynecologic nursing	168	50.0
Medical/surgical nursing	105	31.5
Pediatric	26	7
Psychiatric	10	3

Note. In decreasing percent total. Respondents indicated the clinical background they were experienced in prior to working in reproductive endocrinology/assisted reproductive technology.

TABLE 3
Knowledge and Skills

	Percent of Total
Knowledge	
Anatomy & physiology	92.9
Normal menstrual cycle	90.5
Pathophysiology	90.4
Skills	
Teaching	96.4
Knowledge of treatment options	95.8
Knowledge of diagnostic tests	94.9
Counseling skills	83.3
History taking	61.3
Physical assessment skills	47.9
Ultrasound technique	35.7

Note. In decreasing percentage. Respondents indicated the theoretical information and the skills they believed were necessary to function adequately in reproductive endocrinology/assisted reproductive technology.

stated their primary role was management; less than 1% were involved in research.

Nurses oriented to their role with the assistance of a variety of providers. The largest percentage (34.5%, n = 115) of the respondents in this study stated that their orientation was accomplished by a nurse/physician combination, 23.7% indicated another nurse was responsible for their orientation, and 16% stated their orientation to their job had been conducted by a physician. The remaining respondents identified several nonnurse members of the health care team, including ultrasonographers, laboratory personnel, and administrative office staff as participants in their orientation. Ninety-eight of the participants, or 29%, stated they were not prepared for some aspects of the ARN role and the incumbent responsibilities. Sixty-seven percent of the participants stated they were involved in writing the protocols for their practice, and 69% indicated their practice used written protocols.

Table 3 indicates specific areas of knowledge or skill believed to be essential for clinical practice in RE/ART nursing and indicates the percentage of nurses in practice sites who reported that the identified areas are core content for practice.

Professional Role

Seventy-three percent of the nurses surveyed reported their primary role was direct patient care. Numerous responsibilities were cited as being incorporated into the everyday activities of the practice setting. Respondents indicated assessing clients' knowledge deficits, providing instruction and anticipatory guidance, offering therapeutic support, offering compassion, and explaining test results and treatment options were among the highest ranking activities they performed in the direct patient care role. Fifty-five percent of the nurses reported that the most important aspect of their role was providing instruction to patients. Sixty-four percent stated that most of their time in the clinical setting was in fact spent in teaching clients. Twenty percent identified technical skills as a very important aspect of their role, and 18.2% reported that technical skills consume a lot of their time in the clinical setting (see Table 4).

Professional Development

Among the respondents, 88 (26.9%) of the total sample, indicated that they had obtained certification in RE/ART nursing, with the peak year being 1989 (n = 23, or 6.8%). A decline was evident thereafter. Length of clinical experience was positively correlated with the nurses' perceived level of proficiency (r = .462, p < .01) and with certification in RE (r = .541, p < .05). Two hundred thirty-

TABLE 4
Technical Skills

	Yes	*No*
Perform intrauterine inseminations	54.5%	45.5%
Assist at oocyte retrieval	46.7%	53.3%
Assist at transfer to uterus	44.0%	56.0%
Perform postcoital tests	36.3%	63.7%
Prepare sperm for insemination	14.0%	86.0%

eight participants, or 70%, stated they were members of the American Society for Reproductive Medicine. Forty-six, or 13.7%, were members of the Association of Women's Health, Obstetric and Neonatal Nurses. An additional 61 respondents, or 18.2%, indicated they held a membership in another professional group, and 91, or 27.1%, belonged to at least one professional nursing organization. Conference attendance with active participation in a workshop devoted to RE/ART nursing in the past 12 months was reported by 250 respondents (74.4%). The most commonly reported job title among the respondents was in vitro fertilization coordinator.

Nurses were asked what they believed would be most helpful for the promotion of RE/ART nursing as a specialty. Forty-five percent believed certification would be beneficial, 31.3% felt continuing education programs were critical, 24.4% stated a formal education process in the area would be valuable, and 22.9% felt additional textbooks would be important.

Discussion

Over time, physician responsibility has shifted to the nurse, increasing the nurses' actual workload and the boundaries of clinical nursing practice. Nurses have developed higher levels of proficiency and have become experts in reproductive nursing. However, recognition of this advancement has not equaled the responsibility undertaken. The absence of clear documentation of the advanced skills and knowledge of ART nurses limits the opportunity for recognition of their valuable contribution to the treatment and care of this patient population.

Standards have considerable influence on the clinical activities of any discipline. By providing written and explicit expectations of the professional group, a basis is established for performance evaluation and accountability. Standards are but one step in establishing a credentialing process for a clinical specialty and a further effort to establish recognition. The evolution of the nursing role appears to be independent of the practice setting, whether it is a private, hospital-based, or university setting. The reported activities of ART nurses are geographically consistent, differing from the findings of the Royal College of Nursing/Fertility Nurses Group reported in 1990. Therefore, one might speculate that the source of financial support of the ART clinic does not appear to be a variable in the evolution of the expanded nursing role for ARN in the Unites States, despite the lack of a formalized structure for preparation to practice. Nurses in assisted reproductive areas appear to have developed a consistent basis of patient care activities.

Nurses have developed higher levels of proficiency, moving from acquiring new skills to acting as experts in reproductive nursing.

It is important to note when reviewing the number of nurses who do have certification, the majority have been active in ARN for a longer period. The relationship between experience and certification may be evident for several reasons. Nurses who self-selected to remain in ARN may have been motivated to seek further validation of their developed skill or to be financially rewarded if certification was obtained. The absence of a certification process for those who became active in this area after 1995 limits a thorough analysis of the value of a certification process for nurses of varying lengths of clinical experience. Experience often contributes to acquisition of proficiency. Information is not available on the objective evaluation of proficiency and expertise among nurses. It would be of value to know if the self-perception of the nurse's performance correlated with certification objective measurement of performance and knowledge base.

During the past 25 years, ARN has continued to evolve in parallel with the rapidly developing scientific and medical technologies that are essential for meeting the needs of infertile couples. The nurses working in this area who responded to this survey reported that their jobs encompass a wide range of responsibilities requiring advanced knowledge and specialized skills. Thus, the field of infertility nursing, as many specialty areas of nursing, appears to have emerged in an unplanned fashion, extending the boundaries of nursing through an unregulated delegation of activities. It is clear that the clinical practice area of ARN has some key elements of specialization and expansion in the area of technical skills (see Table 4).

Nurses have a focused concentration in a specialty area; new technical skills have been acquired by the ARN. This foundation is consistent with the ANA policies statement on characteristics of an APN group. However, integration of theoretical knowledge, use of the nursing

process, synthesis of research-based knowledge, and graduate-level education are currently not explicit criteria for practice within the focus of ARN. Seventy-nine percent of the respondents were not prepared at the graduate level. Licensed practical nurses and master of science nurses may be sharing a scope of practice that has not been well delineated with core competencies and entry-level skills. It is important to note, however, that 20.5% of the survey respondents did have a master's degree in nursing. This can offer those who practice within this area a core group of leaders to take on the task of addressing the educational and legal action needed for advanced practice status.

Limitations

One limitation of the findings from this survey is generalizability of the results. The target population was all nurses who are active in the field of reproductive health. Survey respondents were self-selected. The response rate of 30% is standard for this type of research design. However, it may not be representative of all nurses practicing in the field. Second, the survey instrument was being used for the first time. Further studies with revisions of the instrument would be of value. Respondents were given a 6-week period to return their questionnaires. A second mailing may have improved the response rate, or an extension of the initial time frame may have increased the returned surveys. Finally, additional information on role differentiation in relation to educational level and experience would be of interest.

Recommendations

Almost half of the respondents identified certification as being a tool for furthering the advancement of ARN. Restoring a certification process as a specialty group may offer a first step in documenting the advanced level of practice this group of nurses has developed and establishing a designated title recognized as the official and formal title for those who meet the criteria of an advanced practitioner. Validation through certification offers professional endorsement for the expanded scope of practice and increased responsibilities nurses are taking on daily in the clinical setting. Incorporating a designated focus on nursing issues at assisted reproductive conferences will provide a further venue for the RN to acquire nursing knowledge. Weekend institutes for the advancement of research skills and specific elements of the ARN role could provide opportunities for nurses with certification and advanced levels of experience to teach and mentor the majority of reproductive nurses who have been active in the field 5 years or less. Text materials that offer guidelines for the new practitioner in the in vitro fertilization arena would be of value. Communication and teaching skills are critical components of the ARN's role. Baccalaureate education may be insufficient preparation for the anticipatory guidance and detailed instruction assisted reproductive couples need. Advanced education can offer a method of improving and validating skills.

Graduate-level education could provide skills for the novice and professional endorsement for the expert.

Further measures of abstract thinking, problem-solving skills, conceptualization, and independent decision making would be key in determining the essential elements of APN for nurses in the emerging specialty of ARN. Graduate-level education would be an essential method of both developing skills for application in the clinical setting and acquiring objective measures of entry-level proficiency in these areas. Determination of whether or not nurses in ART want to pursue an advance nursing status with prescriptive authority and graduate-level preparation should be a priority area of consideration as the nursing role continues to develop.

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