

# Association Between Years of Nursing Experience and Clinical Background Among Home Infusion Nurses: A Descriptive Workforce Assessment

Danell Haines, PhD  
Research Consultant

Jeannie Counce, FNHIA  
NHIA

Jennifer Charron  
RN, MSN, MBA  
NHIA

## ABSTRACT

### Introduction

Home infusion nursing involves caring for complex patients, thus incorporates clinical training from a variety of practice settings and requires skills and competence often recognized through certifications and past nursing experience. There is a void in research that describes the experience, education, and credentials specific to home infusion nurses. Therefore, the objective of this research was to determine the educational training and certifications that home infusion nurses possess. The secondary objective was to determine the demographics, years of nursing and home infusion experience, and future professional plans as a home infusion nurse. This information is needed to inform the health care professional and industry about the credentials, training, and experience needed to be a home infusion nurse.

### Methodology

Survey methodology was used in this descriptive study. A questionnaire was developed by a committee of experienced home infusion nurses. The online non-incentivized survey was administered to home infusion nurses across the U.S. using the NHIA membership database and through other professional organizations that include home infusion nurses. Convenience sampling, a non-probability sampling method was used in this research.

### Results

The mean age of the 524 home infusion nurses that completed the survey was 50.02 (SD=11.04). Females and males represented 90.65% and 7.06% of the respondents respectively. Of the nurses, 52.86% had a bachelor's degree in nursing whereas 32.25% had an associate degree in nursing. Nurses had a total of 199 certifications among them with the most common being a Certified Registered Nurse Infusion held by 13.55% of the nurses. A home infusion nurse averages 22.38 (SD=11.61) years of nursing experience with 9.55 (SD=8.92) of the years coming from home infusion. Almost half of the nurses were medical surgical nurses prior to moving to home infusion nursing while 34.54% were intensive care unit (ICU) nurses. 47.14% of the nurses have either ED or ICU experience while 15.27% have both. Most (61.45%) of the nurses were not planning to leave the home infusion profession while 15.84% were planning to leave, primarily due to retirement.

### Discussion

Home infusion nurses have strong educational foundations, come to home infusion from a variety of health care sectors, and have years of experience. More than half of home infusion nurses entered the field with experience in either medical-surgical, ICU, or ED. Most have 6 years or more of total nursing experience while 31.92% had 11-20 years of nursing experience. Once nurses enter the field, a large percentage of them remain in the industry for 10 years or more, and many nurses make home infusion a career choice. The home infusion nursing workforce is relatively stable with only 15.84% reporting they plan to leave the profession in the next 5 years and 65.60% of those indicating they plan to retire.

### Conclusions

Home infusion nurses are prepared clinically and educationally to meet the challenges of complex patients in the home infusion setting. Furthermore, they have more years of experience than nurses working in other settings. Of the home infusion nurses surveyed, most have greater than 6 years of clinical nursing experience with backgrounds in ICU, ED, and medical surgical care in addition to numerous certifications. Nurses appear to be satisfied in their roles, given the small percentage of those who reported intentions of leaving. This durability—along with depth and breadth of experience—should benefit the industry into the future.

## Introduction

The home infusion industry relies on nurses to independently visit patients at home, care for vascular access devices, provide patient education, administer medications, teach patients to self-administer, and provide status updates to the pharmacist and physician. Home infusion nurses must be prepared clinically and educationally to meet the challenges of complex patients in this setting, where the nurses are the front-line advocates for patients as they have the unique ability to observe patients in their home environments. Studies have recognized the link between nurses' educational background and patient care quality and safety. For example, data suggests health care education, training, and credentialing improved direct patient care by improving job-specific knowledge and skills.<sup>1</sup> In one study of 13,735 home infusion patients, patient satisfaction with their nurse's teaching instructions received the highest ratings. 98.69% of patients responded yes to questions about their understanding of how to self-administer their infusion medications and care for their vascular access device.<sup>2</sup> Studies of success rates of home infusion treatments can be used to support the impact of infusion nurses' competence. In a study of 5,216 outpatient parenteral antibiotic therapy (OPAT) patients, 92.98% completed the infusion therapy prescribed, and in an earlier study of 2,106 OPAT patients, 90.84% completed infusion therapy successfully.<sup>3,4</sup> Although firm support for nurse education associated with quality patient care exists, there is a need to describe the experience, education, and credentials specific to home infusion nurses actively providing direct patient care in the home setting.

Home infusion nursing incorporates clinical experience from a variety of practice settings because the environment often requires the nurse to work independently and without close assistance. Accordingly, home infusion nursing combines knowledge and skills with an awareness of risks and how those can be minimized, all requiring additional education and experience. For example, home infusion nurses are prepared to manage adverse drug reactions in the home. Two studies researching home infusion patients reported a low rate of 0.37% (n=5,395) and 0.22% (n=6,842) for drug discontinuation due to adverse drug events.<sup>3,5</sup> Home infusion therapy relies on nurses visiting patients at home to insert and care for vascular access devices.<sup>6</sup> Vascular access device

insertion is a specialized skill requiring competency, and according to a survey of home infusion providers, patient care services of directly employed nurses included catheter insertion for short-term infusions. Of the respondents (n=221), 85.2% of home infusion providers employ nurses skilled at inserting peripheral catheters in the patient's home and 20.4% of respondents employed nurses able to perform midline insertions in the home.<sup>6</sup>

Infusion nursing is a specialization requiring skills and competence often recognized through certifications acknowledging proficient achievement and competent practice.<sup>7</sup> One national provider of home infusion services reported 20% of the infusion nurses employed with their company earned the Certified Registered Nurse Infusion (CRNI®) credential, and the Infusion Nurses Certification Corporation has certified nearly 3,000 active CRNI®s worldwide.<sup>7,8</sup> Home and specialty infusion therapy reported substantial growth between 2010-2020, and the expansion of the infusion therapy market was impacted by an increase in the prevalence of chronic diseases, the emergence of novel treatments such as biologics, and patient demand for more flexibility and control over their health care.<sup>6,9</sup> As a result, the need for highly skilled infusion nurses in various infusion care settings will increase to meet growing demand, and advancements in the treatment of acute and chronic diseases will require the administration of injectable or infused medications to treat patients who already have complex medical needs. This requires ongoing education to stay knowledgeable on standards of practice and medication administration guidelines.<sup>9</sup>

As described, research has demonstrated the association between nurses' experience and education and quality of patient care, but published research has yet to address the education and experience of home infusion nurses, specifically nurse demographics, years of nursing experience, and years of home infusion experience. Therefore, the objective of this research is to describe the education and experience home infusion nurses possess. The secondary objective was to determine the demographics, years of nursing and home infusion experience, and future professional plans as a home infusion nurse. Collectively, this information is needed to adequately inform the health care professional and industry about the credentials, education, and experience needed to be a home infusion nurse.

## Methodology

This research is descriptive in nature and was administered by the National Home Infusion Foundation (NHIF). Survey methodology was selected as most appropriate for this study since the primary ends sought were to describe the qualifications and experiences of home infusion nurses. A questionnaire was developed by a National Home Infusion Association (NHIA) committee of experienced home infusion nurses. The online non-incentivized “Home Infusion Qualifications Survey” was administered to home infusion nurses across the United States using the NHIA membership database and through other professional organizations that include home infusion nurses. Convenience sampling, a non-probability sampling method was used in this research.

The questionnaire began with the qualifying question, “Do you currently practice home infusion nursing defined as visiting patients who are prescribed infused medications in their homes to provide education, administration of medication, assessment, catheter care or other duties directly to support their infused medications.” If the respondent answered “yes” to this question, they were invited to complete the remaining sections of the questionnaire. To complete the survey a NHIA membership was not required. Section 1 of the questionnaire included demographic questions while the remaining sections focused on home infusion nurses’ education, training, experience, and future nursing plans. The questionnaire assured the respondent’s anonymity, and that the data would be de-identified. Additionally, the respondent was not required to complete the questionnaire and could stop answering questions at any time.

## Analysis

Data was analyzed using IBM SPSS Statistics. Frequency and the percentage for each response option was calculated for each of the survey questions. Mean and standard deviation were calculated for respondent age and years of nursing and home infusion experience. This data was also recoded into categories.

## Results

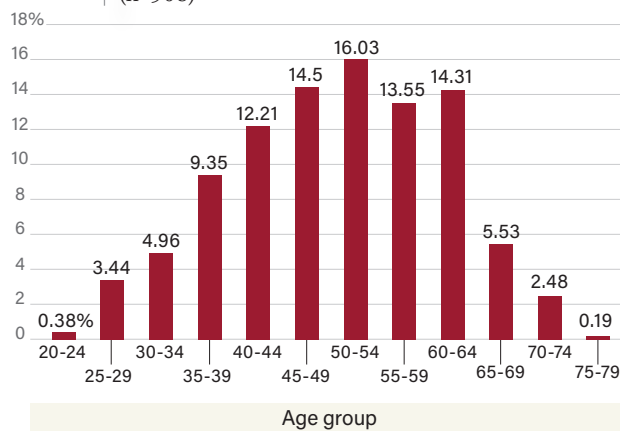
The NHIF Home Infusion Nursing Qualifications Survey was administered online between October and December 2023. There were 546 total respondents of which 525 met the qualifying question. One

respondent did not answer any of the questions, thus the total sample size of survey respondents was 524. Not all respondents answered every question as noted by the inconsistent sample sizes in the data tables.

## Demographics

The mean age of the respondent was 50.02 (SD=11.04) years with a range of 23 to 76 years. Slightly more than 60% of the respondents were between the ages of 45 and 64 years. As shown in Figure 1, the largest age group, with 16.03% of the nurses, were the 50–54-year-olds. Females and males represented 90.65% and 7.06% respectively of the nurses while 2.10% preferred not to answer the question and 1 nurse indicated they were gender non-conforming. White/Non-Hispanics represented 79.96% of the sample while Blacks/African Americans, Hispanics, and Asians were 4.77%, 4.39%, and 4.20% respectively.

FIGURE 1 | Percentage of Respondents Within Each Age Group (n=508)



## Higher Education and Certifications

When asked about the highest nursing or nursing-related educational attainment, 52.86% (n=277) of the nurses had a bachelor’s degree in nursing, 32.25% (n=169) had an associate degree in nursing, 10.11% (n=53) had a master’s degree in nursing, 3.82% (n=20) had a diploma, and 0.95% (n=5) had a doctorate. In addition to having various nursing degrees, the group of 524 home infusion nurses had a total of 199 certifications among them, as shown in Table 1. The most common certification, held by 13.55% of the nurses is a Certified Registered Nurse Infusion (CRNI®), while 7.63% have an immunoglobulin certification (IgCN®) and 4.58%

have an oncology certification (OCN®). Table 1 shows the variety of certifications home infusion nurses currently possess.

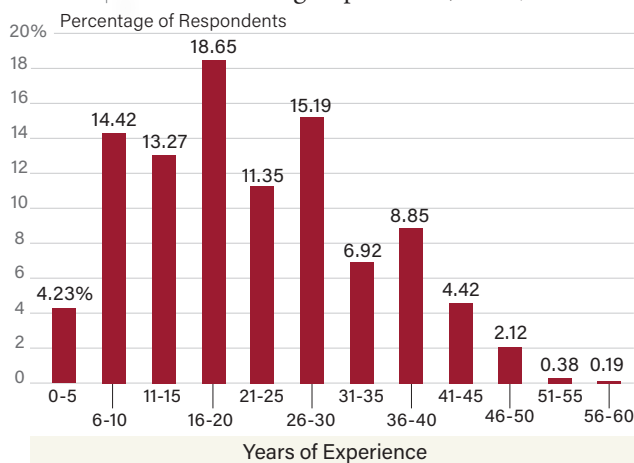
TABLE 1 | Percentage of Nurses with Each Certification

Certification	Frequency	Percent
Certified Registered Nurse Infusion (CRNI®)	71	13.55%
Immunoglobulin Certified Nurse (IgCN®)	40	7.63%
Other	35	6.68%
Oncology Certified Nurse (OCN®)	24	4.58%
Vascular Access Board Certification (VA-BC™)	13	2.48%
Certified Nurse Educator (CNE®)	3	0.57%
Cardiovascular Nursing Board Certification (CV-BC™)	3	0.57%
Certified Nutrition Support Clinician (CNSC®)	2	0.38%
Pediatric Nursing Board Certification (PED-BC™)	2	0.38%
Gerontological Nursing Board Certification (GERO-BC™)	1	0.19%
TOTAL	199	

**Health Care Experiences**

The typical home infusion nurse has 22.38 (SD=11.61) years of various nursing experience. The highest percentage of nurses (18.65%) have between 16 and 20 years of nursing experience, as shown in Figure 2. The mean number of years of home infusion nursing

FIGURE 2 | Years of Nursing Experience (n=520)



experience is 9.55 (SD=8.92) years. As shown in Figure 3, almost half of the home infusion nurses have 5 or less years of experience specific to home infusion while almost one-third of the nurses have between 1 and 3 years. One home infusion nurse had 40 years of home infusion experience while another had 56. Figure 4 compares the total years of nursing experience across the home infusion group contrasted with a national survey of nurses working in the United States.

FIGURE 3 | Years of Home Infusion Nursing Experience (n=511)

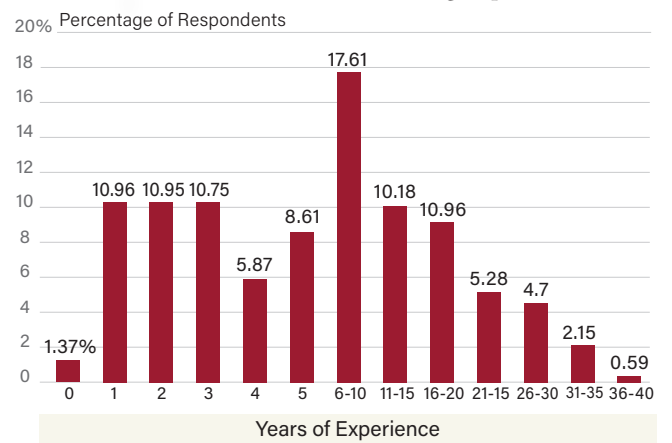
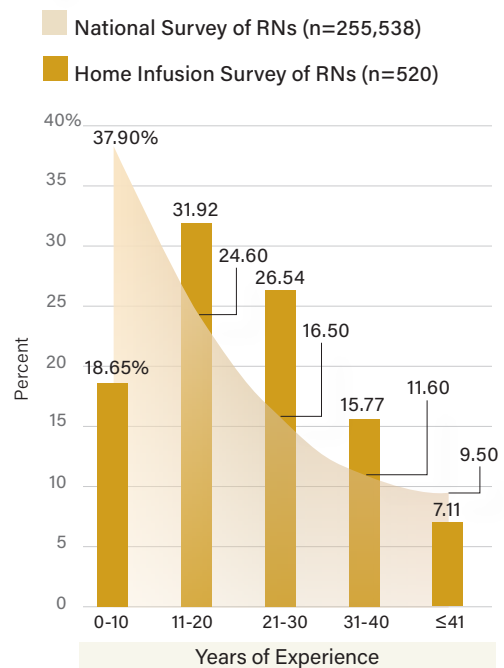


FIGURE 4 | Nursing Experience of Home Infusion Nurses Surveyed Compared to a National Nursing Survey<sup>10,11</sup>



Nurses gravitate to home infusion nursing from a variety of other nursing specialties. On average, home infusion nurses have experience from 3 different nursing disciplines prior to becoming a home infusion nurse. Almost half (49.62%) of the home infusion nurses were medical surgical nurses prior to moving to home infusion nursing while 34.54% were intensive care unit (ICU) nurses, 28.05% were home care nurses, and 25.95% were emergency department (ED) nurses, as shown in Table 2. After additional analysis of the data, it was noted that slightly less than half (47.14%) of the nurses have either ED or ICU experience, while 15.27% have both. Only 4 of the home infusion nurses have exclusive experience in home infusion nursing.

TABLE 2 | Nursing/Health Care Experience Prior to Becoming a Home Infusion Nurse

Previous Experience	Frequency	Percent
Medical Surgical	260	49.62%
Intensive Care Unit	181	34.54%
Homecare	147	28.05%
Emergency Department	136	25.95%
Oncology	106	20.23%
Cardiac Step Down	93	17.75%
Case Management	76	14.50%
Long Term Care	69	13.17%
Physician Office Infusion Suite	63	12.02%
Nursing Educator	56	10.69%
Surgical Outpatient	55	10.50%
Surgical Inpatient	54	10.31%
Administration	49	9.35%
Primary Care	44	8.40%
Vascular Access Device Team	39	7.44%
PICC Insertion Team	34	6.49%
Licensed Practical Nurse	32	6.11%
Quality	17	3.24%
Emergency Medical Technician	9	1.72%
Paramedic	5	0.95%
All nursing experiences has been in home infusion	4	0.76%
Accreditation	2	0.38%
Total	1,531	

### Future Home Infusion Nursing Plans

When asked about future nursing plans within the next 5 years, 61.45% of the nurses indicated they were not planning to leave the home infusion profession while 22.71% were unsure and 15.84% were planning to leave. Of those planning to leave, 65.60% indicated they were retiring while 16.87% and 8.43% were planning to pursue another opportunity in nursing and health care respectively.

### Study Limitations

As with most studies using survey methodology, this study had limitations. Convenience sampling is a non-probability sampling method commonly used in survey methodology even though it has limited external validity. As a result, the study findings might not be generalizable to the population of home infusion nurses. For this reason, some demographic subsets may have been excluded from the results. With survey methodology there is also the possibility of non-response error. Specifically, it is not known if the respondents' results would be similar to the non-respondents'. Survey methodology provides self-report data which may be erroneous when the respondent does not answer truthfully or may not understand the question. Lastly, since the survey was administered electronically, there is the likelihood of respondent data entry errors. Even though survey methodology has deficiencies, it is commonly used in descriptive research.

### Discussion

Home infusion nurses have strong educational foundations, come to home infusion from a variety of health care sectors, and bring with them years of experience. The type of experience nurses cultivate before entering home infusion reflects a knowledge base that is both broad and deep. In this study, high numbers of home infusion nurses entered the field with experience in either medical surgical (49.62%), ICU (34.54%), or ED (25.95%), indicating these clinicians are familiar with many disease states and treatments across multiple patient populations. More than 95% of home infusion nurses have 6 years or more of total nursing experience. In addition, the results found a significant proportion of nurses transitioned into home infusion during the past 5 years. The study data provided key details related to the home infusion nursing workforce and added to the understanding of the education and expertise of home infusion nurses.



Home infusion nurses have more years of experience than nurses working in other settings (Figure 4).<sup>10,11</sup> In this study, 31.92% of home infusion nurses had 11-20 years of nursing experience, and 26.54% of the respondents had 21-30 years of experience. According to a national survey completed by nurses working across multiple areas of health care, nurses reported 24.6% had 11-20 years of experience, and 16.5% had 21-30 years of nursing experience.<sup>10,11</sup> This study found almost half the nurses surveyed transitioned to home infusion in the last 5 years, with one-third responding they made the change during the past 1-3 years. Based on the survey results, home infusion has a growing interest among experienced nurses, which is taking them down this career path. Accordingly, once nurses enter the field, our study found a large percentage of them remain in the industry for 10 years or more, and many nurses made home infusion a career choice. The longevity of nurses in the home infusion industry indicates a level of fulfillment. Nurses stay where they feel valued in environments with sustainable working conditions and effective leadership.<sup>12</sup>

After entering the field, many home infusion nurses continue to engage in education and skills-building in areas relevant to their practice. For example, of the home infusion nurses surveyed, 13.55% achieved CRNI®, the specialty certification for infusion nursing. The percentage of CRNI® of the nurses surveyed might have been higher if the survey had included responses from management-level nurses who may be more likely to achieve and maintain certifications to support career advancement. As the field expands and an increasing number of specialty therapies are deemed appropriate for alternate site administration, home infusion nurses responded as having achieved certification in additional specialized clinical areas, such as managing and administering immunoglobulin (Ig) therapy (7.63%) and oncology (4.58%). The comprehensive nature of infusion therapy should incorporate evidence-based training and certification to support the clinicians who are responsible for patient outcomes.

In addition to having nursing experience, home infusion nurses enter the field with strong educational backgrounds. More than half (52.86%) have a bachelor's degree, the newest nursing education standard. This is on par with national statistics showing the percentage of bachelor-degreed nurses steadily increasing from 43.4% in 2015 to 51.1%

in 2022.<sup>10,11</sup> There are more home infusion nurses with associates degrees than the national average (32.25% compared to 24.3%) and fewer with master's degrees (10.11% compared to 17.9%).<sup>10,11</sup> This could be attributable to home infusion nurses being older (majority in the 50-54 age group compared to 30-34 nationally) and entering the field after gaining experience in other sectors.

The home infusion nursing workforce appears to be relatively stable with only 15.84% reporting they plan to leave the profession in the next 5 years and 65.60% of those indicating they plan to retire. This stands in stark contrast to a recent exodus of nurses from the workforce. As newer nurses—those in school and their early careers—reach the home infusion workforce, it is likely they will be more racially and ethnically diverse than today's home infusion nurses who are not as diverse as the national nursing workforce. For example, 73.3% of the general population of nurses and 79.96% of the home infusion nurses are White non-Hispanic. Due to the difference, the general population of nurses has a larger percentage of nurses representing each ethnic group than the home infusion nurses, with the largest disparity among the Black non-Hispanic nurses. Black non-Hispanics represent 4.70% of the home infusion nurses, while 7.8% represent the general population of nurses. When gender is compared, the general population of nurses is represented by 9.6% male nurses, while home infusion has 7.06%.<sup>10,11</sup>

## Conclusion

Of the home infusion nurses surveyed, most have greater than 6 years of clinical nursing experience with backgrounds in ICU, ED, and medical surgical care. The type and background experiences of the surveyed nurses indicate they are seeking and finding a clinically challenging work environment in home infusion. Home infusion nurses appear to be satisfied in their roles, given the small percentage of those who reported intentions of leaving. This durability—along with depth and breadth of experience—should benefit the industry going forward. However, a projected national nursing shortage is likely to create a more competitive landscape among health care sectors recruiting nurses into their respective workforces. In this context, the aging of the current home infusion nursing workforce and accelerated expansion of the field overall indicate the need for future recruitment and education.

## Disclosures

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**Commentary:** When reviewing a manuscript submitted by one of *Infusion Journal's* editors or staff, the author is deliberately excluded from all aspects of the review process. The Editor-in-Chief or alternate editor is responsible for handling the peer review process independently of the author. The author is not aware of the choice of peer reviewers and is not present when discussing the manuscript at editorial meetings.

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Amber Webb, MSN-HI, RN, CRNI, OHSU Home Infusion Pharmacy

## Author Contact/Affiliation

Danell Haines, Danell.Haines@nhia.org

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