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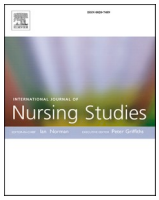

Predictors of job turnover among home health versus hospital nurses: An observational study using the National Sample Survey of Registered Nurses☆

Zoe Samson [a,b,*], Laura M. Wagner [a,f], Lauren J. Hunt [c,d,e], Ulrike Muench [a,c,f]

[a] School of Nursing, University of California San Francisco, California, USA
[b] MaineHealth, Center for Nursing Research and Quality Outcomes, USA
[c] Philip R. Lee Institute for Health Policy Studies, University of California San Francisco School of Medicine, California, USA
[d] Department of Epidemiology and Biostatistics, University of California San Francisco School of Medicine, USA
[e] Global Brain Health Institute, University of California San Francisco, California, USA
[f] Healthforce Center at University of California San Francisco, USA

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ABSTRACT

Background: The need for skilled in-home nursing care is growing, but the home health nursing workforce faces challenges with job turnover, fueling the concern that the supply of these nurses will be inadequate to meet demand.
Objective: To compare rates and predictors of turnover among registered nurses working in home health compared to hospital settings.
Study design: This was a secondary, cross-sectional analysis using data from the National Sample Survey of Registered Nurses (NSSRN) from survey years 2008, 2018, and 2022.
Population: Registered nurses in the US labor market (n = 3,381,768 in the 2008/2018 surveys; 1,625,288 from the 2022 survey).
Methods: Data for the 2008 and 2018 surveys were pooled and analyses were conducted separately with the 2022 data due to sample frame changes prohibiting pooled analyses. The primary outcome was job turnover and the independent variable was employment in either a hospital or home health setting. Covariates included socio-demographic, labor and workplace characteristics. We conducted descriptive statistics of sample characteristics and multivariate logistic regression models to estimate marginal effects of predictors on the probability of turnover from the hospital or home health setting. We then assessed interactions between setting and labor/workplace variables to assess predictors of turnover for home health versus hospital registered nurses.
Results: Overall, home health registered nurses reported longer career tenures and less advanced educational preparation than hospital nurses. Rates of turnover were comparable between home health and hospital registered nurses. Longer career tenure was generally protective against job turnover, but home health registered nurses were more likely than hospital registered nurses to turnover later in their career. Predicted probability of turnover at 11 to 20 years in nursing was 14.7 % for home health registered nurses (95 % CI 11.2, 18.2) versus 12.1 % for hospital registered nurses (95 % CI 10.9, 13.3). At 21 to 30 years, it was 16.3 % for home health registered nurses (95 % CI 12, 20.5) and 11 % for hospital registered nurses (95 % CI 9.6, 12.4). Interaction terms were also significant for work setting and weekly hours, demonstrating increased likelihood of turnover for home health registered nurses past the 40-h mark. There were no significant interactions identified in the 2022 data.
Conclusions: Our results suggest that attracting nurses earlier in their careers and schedule stabilization may be of particular importance for growth and retention efforts in the home health registered nurse workforce.

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* Corresponding author at: 22 Bramhall Street, MGB 2614, Portland, ME, 04102, USA.
E-mail address: zoe.samson@mainehealth.org (Z. Samson).

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What is already known

- The demand for home healthcare and for home health registered nurses is growing with population aging and preferences for aging and receiving care in the home.
- In the United States, home health registered nurses once expressed relatively high levels of job satisfaction, but that appears to have changed around the year 2000.
- Turnover and job vacancy rates for home health registered nurses appears to be high and the home health registered nurse workforce may be shrinking.

What this paper adds

- Additional weekly work hours significantly predicted turnover for home health registered nurses, who were increasingly more likely to turnover than hospital registered nurses when working over 40 h per week.
- Home health registered nurses were significantly more likely than hospital registered nurses to report job turnover later in their careers.
- Stabilizing workloads and schedules and attracting early career nurses could bolster the home health registered nurse workforce.

1. Introduction

Global population aging demands changes to healthcare infrastructures to meet care needs of older adults (World Health Organization, 2024). Registered nurses are central to the provision of home health services, particularly for aging and homebound seniors who may have difficulty accessing other forms of healthcare (Ornstein et al., 2015; Qiu et al., 2010). In the United States (US), the demand for home health is growing rapidly (Colato and Ice, 2023), fueled by trends favoring aging in the home (Bernacet et al., 2021) and growth in the population of homebound individuals (Ankuda et al., 2021). Consequently, the demand for home healthcare jobs (Colato and Ice, 2023) and home health registered nurse positions in particular (Martiniano and Moore, 2018) are projected to increase.

Home health registered nurses fulfill unique and vital roles in US home healthcare. For instance, under Medicare (2023) regulations registered nurses must perform initial patient assessments and develop comprehensive care plans when nursing services are ordered. Registered nurses then provide ongoing skilled nursing care and supervise licensed practical and vocational nurses providing care. Despite growing service demands, home health registered nurses comprise a small and declining workforce, representing just 3.4 % of the employed US registered nurse workforce in 2022, down from 6.1 % in 2015 (Smiley et al., 2023). Job vacancy rates at 24 % and estimates of annual job turnover around 30 % (Bergman et al., 2021; Hospital and Healthcare Compensation Service, 2022) suggest that the supply of home health registered nurses may not be adequate to meet care needs. The purpose of this study was to assess the work-related issues that contribute to home health registered nurse turnover to identify areas that would be conducive to targeted growth and retention efforts.

1.1. Workplace issues

Interrogating workplace issues is necessary to understand what is driving workforce instability. Home health registered nurses in the US once rated their work environments more positively than hospital registered nurses, but by 2000 they reported among the lowest job satisfaction, second only to nursing home registered nurses (Simmons et al., 2001; Sochalski, 2004). Growth of for-profit agency ownership and shifts in legislation and reimbursement (Cabin, 2016) – particularly the 2000 move from fee-for-service to prospective payments - may have worsened working conditions by increasing profit focus and administrative burdens (McCreary, 2020; Smith-Stoner, 2002; Tullai-McGuinness, 2008). In the following years, home health nurse turnover, turnover intention, and job stress and dissatisfaction have been associated with high patient visit volumes, productivity demands, excessive documentation (Narayan, 2023; Ellenbecker et al., 2006), staffing challenges related to recruitment and retention issues alongside high workloads (Garza and Taliaferro, 2021; Pogorzelska-Maziarz et al., 2020), long hours with unpaid overtime (Barker, 2011), schedule volatility (Bergman et al., 2021), and cost-saving measures limiting ability to deliver patient-centered and culturally sensitive care (Narayan and Mallinson, 2021). Outside the US, similar reported stressors include unmanageable and unpredictable workloads and service demands, time pressures, poor organizational supports and inadequacy of resources (Kaihlanen et al., 2023; Lee et al., 2021; Petersen and Melzer, 2023; Stien and Josefsson, 2024).

1.2. Home health access

Home health workforce instability may contribute to unmet care needs. Staffing shortages have been linked to home health referral rejections, failure to fulfill services (Graham, 2022; Pennsylvania Homecare Association, 2022) and prolonged hospital stays (Maynard et al., 2019). Inadequate staffing can also delay service initiation, which is a major quality indicator for Medicare home health (Centers for Medicare and Medicaid Services, 2024a, 2024b) and has been linked to rehospitalizations (Smith et al., 2021).

1.3. Home health quality

Workplace challenges can also undermine quality of care. Positive nurse work environments in home health have been associated with improved patient outcomes, like reduced hospitalizations (Jarrín et al., 2017). Conversely, high workloads and insufficient organizational supports have been shown to impair performance of basic functions, like enacting home-safety measures (Lindberg et al., 2023) while hampering delivery of quality care (Giltenane et al., 2022; Lindberg et al., 2023). This suggests that the occupational issues of home health nurses are closely tied to patient care quality, and that understanding what drives turnover can support efforts to strengthen the workforce and improve care.

1.4. Aims

Improving nurse retention has potential to improve the quality and accessibility of home health care. Understanding the drivers of turnover is vital to developing solutions tailored to home health nurses' needs, but most evidence on home health nurse turnover predates the last decade and we are aware of little recent or large-scale quantitative reporting connecting workplace experiences to workforce outcomes in home health nursing. A more extensive body of research on hospital registered nurse job turnover has generated better understandings of why registered nurses leave hospital jobs (Woodward and Willgerodt, 2022). Hospitals are the largest employment sector of US registered nurses (Smiley et al., 2023); as such, hospital workplace issues contribute to generalized assumptions about nurse turnover and may be treated as the default concerns informing workplace policy reform. This underscores the need to interrogate turnover in settings like home health, where distinct issues may shape workforce dynamics and require setting-specific policy responses.

The specific aims of this study were to examine likelihood of turnover among home health compared to hospital registered nurses and to identify and differentiate work-related factors that contribute to turnover in each setting.

2. Methods

2.1. Data & sample

This investigation analyzed data from the 2008, 2018 and 2022 public use files of the National Sample Survey of Registered Nurses (NSSRN). It is the longest-running survey of registered nurses in the US, the premier source of US nursing workforce data and has been conducted by the Health Resources and Services Administration Bureau of Health Workforce every four years since the late 1970s until 2008, when the survey was temporarily discontinued then subsequently reinstated in 2018. The survey draws from files provided by US state Boards of Nursing to generate samples of US nurses reflective of the national nursing population. It is designed to describe and support analysis of a rich set of nursing workforce characteristics—such as employment, licensure, education, and demographics—as well as workplace issues including compensation, work activities, time allocation and job satisfaction (Health Resources and Services Administration, 2008), making it a strong data source for this analysis.

Our study sample was comprised of employed registered nurses with active patient care duties and without advanced practice training. Nurses were sampled from files of actively licensed registered nurses provided by state Boards of Nursing. Data were collected via web and paper-based questionnaires between July 2008 and March 2009 for the 2008 survey, between April and October 2018 for the 2018 survey, and December 2022 and April 2023 for the 2022 survey. The combined 2008 and 2018 public use files contained a total of 83,625 responses (33,352 in 2008 and 50,273 in 2018) and 2022 file contained 49,234. We included 27,818 registered nurses who were employed in either home health or hospital settings and had non-missing data on all covariates.

2.2. Measures

2.2.1. Outcome

The primary outcome was job turnover. Turnover was defined as endorsement of departure from the primary job (the job in which the nurse spent the most time if they worked multiple) held on March 10, 2008, December 31, 2017 or December 31, 2021. It is noted that survey wording on job departure varied between the 2008 and 2018/2022 surveys; specifically, in 2018 and 2022 nurses indicated whether they had already left the job at the time of survey completion, whereas in 2008 the wording included both having left the job and plans to do so within the next 12 months, thereby incorporating turnover intention. Turnover intention reflects an employee's willingness to leave a position and is recognized as a precursor to actual turnover and a meaningful indicator of workforce instability among nurses (Takase, 2010).

2.2.2. Exposure

The main independent variable measured setting of registered nurses based on a survey item identifying work settings in hospital or home health. Nurses working in hospice or private duty home health were not included in our definition due to the distinct nature of their jobs and responsibilities. The relevant 2022 survey option for setting was "Home Health or Day Care Services." Although the survey does not explain what is meant by 'Day Care Services' we were concerned that this could refer to private duty home nursing. Unfortunately, using another survey item that identified home health as an option for 'job title' generated a sample with too few observations to conduct statistical analyses. Therefore, we used the option for setting to define our 2022 sample, although it prevented precise definition of our sample.

2.2.3. Covariates

Sociodemographic variables included gender measured as a forced-choice binary of male or female, race and ethnicity which was defined by self-identification as Latine or five other non-Latine races, presence of a child under age six for whom the respondent cared, marital status, highest nursing or nursing-related education, and country of nursing program dichotomized as either US or outside the US. A geographic variable of region was based on nine geocodes of US census divisions. We also included a variable year indicating 2008 and 2018.

A series of variables measuring labor-focused characteristics included years in the nursing workforce, which we coded as a categorical variable in order to isolate career periods that were potentially important for turnover patterns, such as new nursing and years approaching retirement; specifically, our categories were under five, six to ten, 11 to 20, 21 to 30, and over 30 years. We also measured hourly wage, which was constructed by dividing annual earnings by annual hours worked and adjusting for inflation by the Consumer Price Index; number of weekly hours worked, measured continuously and limited to at least 6 and less than 75 h; and age at graduation for degree initially conferring registered nurse status.

Several variables measuring workplace characteristics were based on the respondent's indication of percentage of their work time devoted to a variety of duties- specifically, patient care and charting, non-nursing tasks, and administrative/managerial/supervisory duties. We also measured patient population in which the respondent indicated more than half of their patient care time was spent, with categories adult under 65, geriatric 65 and older, prenatal, neonatal, pediatric, and a category indicating multiple age groups or less than 50 % with any single group.

In 2022, several variables needed to be either collapsed or eliminated due to a smaller sample size of home health registered nurses. Race and ethnicity was reduced to a binary of White and non-White, prenatal and neonatal patient populations were collapsed into 'perinatal,' and the variable distinguishing US versus non-US education was eliminated. Weekly hours worked were coded categorically in the 2022 National Sample Survey of Registered Nurses; after eliminating outliers and collapsing categories to allow sufficient observations, we included categories for 19 or fewer, 20 to 29, 30 to 39, 40 to 49 and 50 to 69 h worked per week.

2.3. Statistical analyses

Descriptive characteristics were used to assess statistically significant differences between home health and hospital registered nurses. Next, logistic regression models assessed odds of job turnover by setting (home health or hospital). We conducted our regression models in a serial fashion, first with unadjusted bivariate comparisons of turnover by setting, then in multivariable models that sequentially added adjustments for sociodemographic, labor, workplace, and time/geography variables. Next, we included models with interaction terms between job setting (home health versus hospital) and both labor and workplace characteristics. Interaction models were designed to assess whether the predictors of turnover differed between home health and hospital registered nurses. Results from logistic regression models are reported as marginal effects multiplied by 100 to indicate percentage point differences in probabilities of turnover (eg., a coefficient value of 0.075 would be reported as a 7.50 percentage point difference). We also calculated predicted probabilities for regression models interacting labor/workplace characteristics and job setting. Survey weights were applied to approximate results to the entire US population of registered nurses.

To account for varying definitions of turnover across survey years – specifically, the incorporation of turnover intention with turnover in 2008 – levels of turnover were estimated separately for each survey year. Other analyses, including estimates of turnover predictors, were conducted pooling data from the 2008 and 2018 datasets. Pooling facilitated highly powered estimates, which was valuable given the limited availability of large-scale quantitative research on home health nurse turnover. Furthermore, registered nurses in both 2008 and 2018 worked under the same home health reimbursement model—the Prospective Payment System—which likely contributed to comparable working conditions given consistent reimbursement policies across

those years. Additionally, despite variation in definitions of turnover, we determined that pooling the data to estimate turnover predictors was appropriate, based on the notion that the mechanisms underlying both turnover and turnover intention are comparable and may shaped by similar influencing factors. Data from the 2022 survey became available in 2024, but variance estimation techniques used in 2022 precluded pooling data from prior years. Additionally, substantial changes to the home health work environment—driven by the COVID-19 pandemic and the implementation of a new Medicare home health delivery model in 2020—were deemed significant enough to compromise comparability, further rendering pooling of 2022 data inappropriate. For the sake of timely reporting and transparency, we did separately analyze and report 2022 findings, but due to analytic limitations we interpret 2022 findings with caution.

3. Results

Table 1 presents characteristics of home health and hospital registered nurses (weighted n = 3,381,768) in the 2008 and 2018 surveys. Home health registered nurses comprised 8.74 % of the total sample, reflecting their relatively small share of the overall US nursing workforce. This corresponded to an unweighted sample of 2614 home health registered nurses. After applying survey weights to approximate the national population, our analytic sample included approximately 295,566 home health registered nurses. Home health registered nurses tended to work with less advanced educational preparation than hospital registered nurses, with 56.79 % reporting associate or diploma as their highest degree compared to 43.20 % of hospital registered nurses. Home health registered nurses had significantly longer workforce tenures, with fewer reporting under five years as a registered nurse (14.61 %) than hospital registered nurses (28.69 %) and significantly more reporting 20 or more years in the workforce (40.70 %) than hospital registered nurses (28.65 %). Home health registered nurses on average reported more work time spent on administrative, management and supervisory tasks (16.71 % versus 10.95 % for hospital registered nurses) and less time on patient care and charting (55.97 % versus 64.16 % for hospital registered nurses). Home health registered nurses showed similar differences to hospital registered nurses in terms of sociodemographic, educational and experiential differences in the 2022 survey. They also reported working more hours per week, with 22.48 % of home health registered nurses reporting working 50 or more hours per week. A full set of findings from the 2022 survey are reported in Appendix 1.

Table 2 presents the probability of turnover among home health and hospital registered nurses. A full set regression results yielding these estimates are provided in Appendix 1. Overall, turnover rates were similar between the two groups. While home health nurses exhibited a slightly higher probability of turnover in each year, these differences were not statistically significant, particularly after adjusting for sociodemographic and work-related characteristics. Turnover in both settings was several percentage points higher in the 2008 survey compared to 2018, likely due to the inclusion of turnover intention in the 2008 definition. Turnover rates increased sharply in both home health and hospital settings in the 2022 survey, coinciding with the COVID-19 pandemic.

Table 3 presents the results of our multivariate logistic regression models estimating job turnover predictors in the pooled 2008 and 2018 surveys. Being widowed, divorced or separated was associated with a 3.52 percentage point (95 % CI 1.64, 3.59 %) higher probability of turnover compared to being married or partnered. Longer tenure in the registered nurse workforce was significantly associated with reduced probability of turnover; compared to a tenure of fewer than five years, having worked as a registered nurse anywhere between six and > 30 years was associated with reduced probability of turnover ranging from 3.96 to 6.84 percentage points in the fully adjusted models. Hourly wage had a modest but significant impact on turnover where every additional dollar earned was associated with a 0.17 percentage point reduction in probability of turnover (95 % CI -0.24, 0.10 %). Perinatal patient populations were associated with lower probability of turnover compared to working with adult populations, with reductions in probability of turnover by 5.72 percentage points (95 % CI -8.97, −2.48 %) for

Table 1
Sample characteristics for home health compared to hospital registered nurses (weighted N = 3,381,768; 3,086,201 hospital and 295,567 home health).

	Hospital (91.26 %)	Home health (8.74 %)	p-Value
	Mean or %	Mean or %	
Gender binary			<0.001
Male	10.12	5.9	
Female	89.88	94.1	
Race & ethnicity			<0.001
White	75.96	82.57	
Latine	7.99	7.1	
Black	6.37	6.2	
Asian Pacific Islander	6.91	2.56	
American Indian/Alaska Native	0.28	0.4	
Other or multiple race(s)	2.5	1.17	
Children under six	20.26	14.67	<0.001
Marital status			<0.001
Married/domestic partnership	70.76	71.99	
Widowed, divorced, separated	14.36	20.38	
Never married	14.89	7.63	
Highest nursing or related degree			<0.001
Diploma/associate	43.2	56.79	
BSN	50.71	38.47	
Masters/doctorate	6.09	4.74	
Graduated US or non-US RN program			0.002
US or US territories	94.53	96.77	
Outside US	5.47	3.23	
Years as RN			<0.001
Under five	28.69	14.61	
Six to ten	18.75	16.81	
11 to 20	23.92	27.88	
20 to 30	16.42	22.75	
Over 30	12.23	17.95	
Hourly wage ($)	36.896	31.851	<0.001
Weekly hours worked	37.106	38.739	<0.001
Age at RN graduation	28.055	29.222	<0.001
% work time patient care and charting	64.157	55.967	<0.001
% work time non-nursing tasks	6.56	4.358	<0.001
% work time administrative, management, supervisory tasks	10.952	16.706	<0.001
Patient population			<0.001
Adult 18–64	41.12	18.14	
Geriatric 65+	27	59	
Prenatal	2.37	0.49	
Neonatal	6.34	1.53	
Pediatric	9.74	16.66	
Other/multiple age groups	13.44	4.18	
Region			<0.001
New England	5.45	8.51	
Middle Atlantic	13.03	15.06	
East North Central	17.1	16.6	
West North Central	8.27	8.26	
South Atlantic	19.38	18.2	
East South Central	6.81	6.29	
West South Central	10.32	10.82	
Mountain	6.81	7.21	
Pacific	12.84	9.05	
Year			0.264
2008	43.56	45.13	
2018	56.44	54.87	

Descriptive statistics obtained using survey weights provided by the National Sample Survey of Registered Nurses (NSSRN). Unweighted n = 27,818 registered nurses: 2614 home health, 25,204 hospital. Using survey weights, approximated home health n = 295,566′ weighted hospital n = 3,086,202; χ^2 and bivariate ordinary least squares regressions performed to test for systematic differences between home health and hospital-based registered nurses.
US = United States; RN = registered nurse.
Source: National Sample Survey of Registered Nurses 2008, 2018.

Table 2
Predicted probability (%) of turnover for home health and hospital registered nurses.

	2008			2018			2022		
	Hospital	Home health	p-Value	Hospital	Home health	p-Value	Hospital	Home health	p-Value
Unadjusted	16.30	19.63	0.000	12.88	14.86	0.263	28.75	27.68	0.728
Adjusted for sociodemographic, labor, workplace and geography characteristics	16.46	17.83	0.299	12.96	13.73	0.625	28.60	30.42	0.566

2008 n = 1,477,715 (unweighted n = 15,584).
2018 n = 1,904,053 (unweighted n = 12,234).
2022 n = 1,625,288 (unweighted n = 9045).
Estimates are derived from logistic regression models estimated odds of job turnover for registered nurses working in home health versus hospital settings. Adjusted models control for gender, race and ethnicity, child(ren) under 6, marital status, highest education, nursing education in or outside the United States (except in 2022 survey due to sample restrictions), United States region, years in nursing workforce, hourly wage time-adjusted for inflation, work time spent on patient care and charting, on non-nursing tasks and on administrative/managerial/supervisory duties, and patient population.
Source: National Sample Survey of Registered Nurses.

prenatal and 5.51 percentage points (95 % CI -8.0, −3.02) for neonatal populations. In the 2022 survey, there was also a reduced likelihood of turnover with longer career tenure, with a range of 5.20 to 19.61 lower probability of turnover at 6 to over 30 years' experience compared to under 5 years of experience ($p < 0.000$ to $p < 0.028$) in fully adjusted models (Appendix 1).

Interaction modeling revealed differences in turnover trends between home health and hospital nurses across career tenures (Fig. 1). Hospital registered nurses demonstrated a continuously decreasing probability of turnover at all career stages until reaching a 30-year career tenure, at which point turnover rose. In comparison, home health registered nurses had reduced probability of turnover until just the 11 to 20 year career tenure, at which point turnover steadily rose. At 21 to 30 years in nursing, home health registered nurses had a 5.28 percentage point higher probability of turnover than hospital nurses ($p = 0.019$). Interaction effects between work setting and weekly hours worked showed that turnover probability increased steadily with longer hours for home health registered nurses, whereas hospital nurses' turnover probability remained relatively stable across different schedules. Distribution of turnover probabilities are visualized in Fig. 2. At 8 h, home health registered nurses had a 5.44 percentage point lower probability of turnover compared to hospital registered nurses ($p = 0.007$), a comparable 0.88 percentage point difference in probability of turnover at 40 h ($p = 0.516$), a 5.66 percentage point increase in probability of turnover at 56 h ($p = 0.016$), and an 11.63 percentage point increase in probability of turnover at 72 h ($p = 0.009$). Interaction models identified no statistically significant differences in work-related factors associated with turnover for home health compared to hospital registered nurses in the 2022 survey.

4. Discussion

This study examined job turnover for home health relative to hospital registered nurses. Overall, levels of turnover from each setting were comparable. While home health registered nurses were somewhat more likely to turnover than hospital registered nurses, these differences were not statistically significant, particularly after adjusting for sociodemographic and workplace factors. Although longer career tenure was associated with lower probability of turnover across both settings in the 2008 and 2018 surveys, the protective effect of experience was lower in home health. We also found that home health registered nurses became increasingly more likely than hospital registered nurses to turnover as their weekly work hours increased. Although differences in turnover drivers for home health versus hospital nurses were not identified in the 2022 data, methodological limitations with the 2022 sample make these results tentative.

The need to attract early-career nurses into home health are highlighted by the relatively greater turnover of later-career home health relative to hospital registered nurses in our sample- specifically, between one and three decades into their careers. Although turnover was generally lower at later career tenures compared to very early career tenures, the protective effect of experience waned earlier for home health registered nurses, who showed higher probabilities of turnover than hospital nurses at longer durations of career experience. This contrasts with previous work that linked tenure to home health nurse job retention (Ellenbecker et al., 2008). Our findings are especially concerning given that a larger proportion of home health registered nurses were in the latter stages of their careers compared to hospital nurses, reflecting a tendency to enter home health later in one's career. Many agencies require prior hospital experience before hiring (Patterson et al., 2013) to reduce training needs and clinical risk associated with the clinical autonomy of home health. Yet the loss of tenured nurses highlights the urgency of attracting early-career nurses. In home health, targeted training programs may be a more effective strategy for attracting and retaining nurses than experiential hiring, given the distinct practice environments and competencies required (Meadows, 2009). Although early career nursing is a vulnerable period marked by burnout and job transitions (Boamah and Laschinger, 2016; NSI Nursing Solutions, 2025), retention benefits have been demonstrated from enhanced training endeavors in home health, like residencies and mentorship programs for newly licensed and newly hired home health registered nurses (Linscheid and Bell, 2021; Pennington and Driscoll, 2019).

Enhanced training may also permit more relaxed hiring practices around education in home health. Larger proportions of home health registered nurses in our sample reported diploma or associate degrees to be their highest level of nursing education. Although bodies like the Institute of Medicine (2011) have urged preference toward baccalaureate (BSN)-prepared nurses, this requirement may disproportionately impair staffing in home health. BSN preparation may be appropriate in hospital settings (Lasater et al., 2024), but associate-prepared nurses may safely play critical and complementary roles to registered nurses in less acute home health settings. For example, alternating registered and licensed practical/vocational nurse visits for patients requiring technical skills (e.g., wound care) can provide registered nurses the bandwidth to perform complex and supervisory tasks like case management and continuous care delivery for sicker and more complex patients (D'Errico and Lewis, 2010). Associate-prepared registered nurses in home health have demonstrated comparable levels of clinical skills and job retention following participation in an internship program (Rosenfeld et al., 2010), suggesting that strong training programs may support staffing without compromising clinical care via continued and expanded hiring of associate-prepared nurses.

We found that turnover of home health registered nurses was sensitive to working overtime (ie., above 40 h per week), with a clear linear trend linking additional weekly hours worked to growing probability of

Table 3
Marginal effects from logistic regression models estimating impact of nurse type and sociodemographic, labor and workplace characteristics on probability of job turnover for home health versus hospital registered nurses (95 % CI), n = 3,381,768.

	Model 1: Work setting	p-Value	Model 2: Sociodemographic, labor, workplace	p-Value	Model 3: Geography & time	p-Value
Work setting						
Hospital [ref]						
Home health	2.49 (0.42, 4.57)	0.018	2.19 (0.01, 4.39)	0.051	1.62 (−0.53, 3.78)	0.140
Gender binary						
Male [ref]						
Female			−2.39 (−4.79, 0.01)	0.051	−2.70 (−5.13, −0.27)	0.03
Race & ethnicity						
White non-Latine [ref]						
Latine			0.10 (−3.37, 3.58)	0.954	−0.05 (−3.50, 3.40)	0.977
Black			−0.92 (−3.57, 1.74)	0.499	−0.78 (−3.50, 1.95)	0.577
Asian Pacific Islander			−3.07 (−6.21, 0.06)	0.055	−3.67 (−6.78, −0.57)	0.02
American Indian/Alaska Native			5.35 (−4.10, 14.80)	0.267	3.78 (−5.23, 12.82)	0.412
Other or multiple race(s)			0.45 (−3.33, 4.24)	0.814	0.17 (−3.57, 3.91)	0.929
Children under six			0.07 (−1.78, 1.93)	0.937	0.10 (−1.74, 1.95)	0.911
Marital status						
Married/domestic partnership [ref]						
Widowed, divorced, separated			3.58 (1.70, 1.93)	<0.001	3.52 (1.64, 5.39)	<0.001
Never married			0.20 (−1.69, 2.10)	0.831	0.62 (−1.30, 2.54)	0.526
Highest nursing or related degree						
Diploma/associate [ref]						
BSN			−0.02 (−1.33, 1.29)	0.972	0.63 (−0.7, 1.97)	0.353
Masters/doctorate			2.56 (−0.54, 5.67)	0.105	3.62 (0.44, 6.80)	0.026
Country of nursing education						
Outside US [ref]						
US or US territories			3.01 (−1.02, 7.04)	0.143	3.29 (0.67, 7.26)	0.103
Years as RN						
Under five [ref]						
Six to ten			−4.28 (−6.29, −2.26)	<0.001	−3.96 (−5.97, −1.96)	<0.001
11 to 20			−6.21 (−8.08, −4.33)	<0.001	−6.07 (−7.91, −4.23)	<0.001
21 to 30			−7.17 (−9.26, −5.08)	<0.001	−6.84 (−8.92, −4.76)	<0.001
Over 30			−5.46 (−7.88, −3.04)	<0.001	−4.60 (−7.07, −2.13)	<0.001
Hourly wage ($)			−0.14 (−0.21, −0.08)	<0.001	−0.17 (−0.24, −0.10)	<0.001
Weekly hours worked			0.08 (0.02, 0.15)	0.013	0.07 (0.00, 0.13)	0.043
Age at RN graduation			0.04 (−0.04, 0.13)	0.345	0.05 (−0.04, 0.13)	0.287
Percent of work time devoted to patient care			0.00 (−0.04, 0.03)	0.799	−0.01 (−0.05, 0.02)	0.392
Percent of work time devoted to non-nursing tasks			0.13 (0.04, 0.21)	0.003	0.10* (0.02, 0.18)	0.019
Percent of work time devoted to administrative, management and supervisory tasks			0.01 (−0.04, 0.05)	0.801	0.00 (−0.05, 0.04)	0.887
Patient population						
Adult 18–64 [ref]						
Geriatric 65+			−1.01 (−2.58, 0.56)	0.207	0.58 (−1.09, 2.27)	0.495
Prenatal			−6.40 (−9.66, −3.14)	<0.001	−5.72 (−8.97, −2.48)	0.001
Neonatal			−6.20 (−8.72, −3.68)	<0.001	−5.51 (−8.00, −3.02)	<0.001
Pediatric			−2.85 (−5.09, −0.62)	0.012	−1.67 (−3.95, 0.61)	0.151
Other/multiple age groups			−3.95 (−5.71, −2.19)	<0.001	−3.20 (−4.96, −1.44)	<0.001
Region						
New England [ref]						
Middle Atlantic					−0.99 (−3.41, 1.42)	0.421
East North Central					−0.66 (−2.91, 1.59)	0.566
West North Central					0.53 (−1.81, 2.87)	0.656
South Atlantic					1.85 (−0.46, 4.15)	0.116
East South Central					1.92 (−0.65, 4.49)	0.143
West South Central					3.26 (0.38, 6.14)	0.026
Mountain					2.81 (0.41, 5.21)	0.022
Pacific					4.37 (1.28, 7.45)	0.006
Year						
2008 [ref]						
2018					−3.94 (−5.22, −2.66)	<0.001
Setting × years as RN interaction						
Home health × under five					−3.43 (−8.63, 1.77)	0.196
Home health × six to ten					−1.93 (−6.41, 2.56)	0.400
Home Health × 11 to 20					2.61 (−1.07, 6.29)	0.164
Home health × 21 to 30					5.28 (0.88, 9.68)	0.019
Home health × over 30					2.55 (−2.70, 7.79)	0.341
Setting × weekly hours worked						
Home health × 8 h					−5.44 (−9.36, −1.52)	0.007
Home health × 24 h					−2.78 (−5.84, 0.30)	0.077

(*continued on next page*)

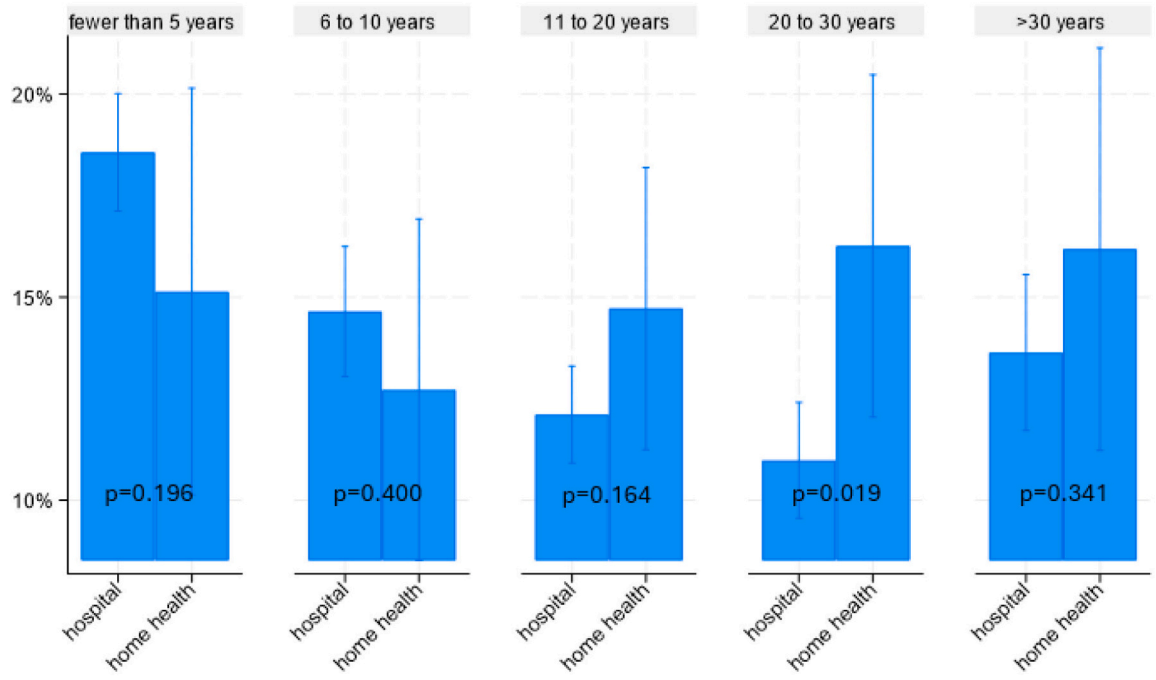
Table 3 (*continued*)

	Model 1: Work setting	p-Value	Model 2: Sociodemographic, labor, workplace	p-Value	Model 3: Geography & time	p-Value
Home health × 40 h					0.88 (−1.77, 3.52)	0.516
Home health × 56 h					5.66 (1.06, 10.26)	0.016
Home health × 72 h					11.63 (2.92, 20.33)	0.009

Marginal effects are multiplied by 100 and report the percentage point (pp) change in the predicted probability of turnover per unit change of covariate or compared to the reference category, controlling for all other covariates. Estimates obtained using survey weights provided by the National Sample Survey of Registered Nurses (NSSRN). Unweighted n = 27,818.
US = United States; RN = registered nurse.
Source: National Sample Survey of Registered Nurses 2008, 2018.

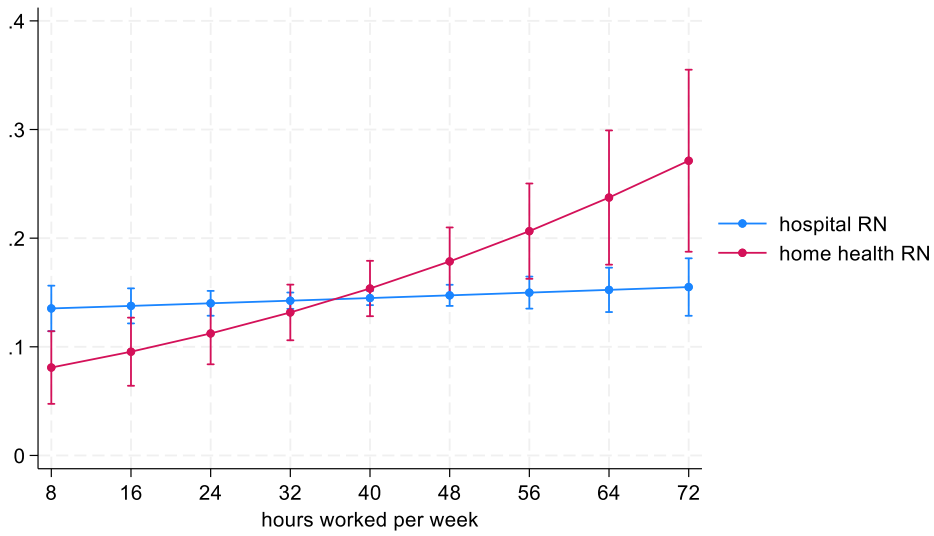
turnover. Heavy workloads and long, unscheduled overtime hours have been linked to turnover (Anthony and Milone-Nuzzo, 2005; Ellenbecker et al., 2006) and job dissatisfaction (Narayan et al., 2023) among home health nurses, in line with the effect of hours in our sample. Recent studies report time pressure and workload issues among home health nurses from diverse countries, including Germany (Petersen and Melzer, 2023), Canada (Nizzer et al., 2024), Iran (Ghezeljeh et al., 2022), and Japan (Ikeda et al., 2021)- suggesting that these challenges are shared worldwide, although specific roles and responsibilities may vary by country or locale. Heavy workloads and working time loads detract from time with patients, create spillover into nurses' personal and family time, adversely affect nurses' mental health, and can promote moral distress, which is a powerful driver of burnout and turnover intention among nurses (Karakachian and Colbert, 2019). Conversely, balanced lifestyle (Jarrín et al., 2017) and flexible scheduling has been associated with work-life balance, patient care continuity, and intent-to-stay in home health nursing jobs (Garza and Taliaferro, 2021; Tourangeau et al., 2014, 2017). Although home health would presumably be more amenable to flexible scheduling than hospital or office-based settings, the reality of home health nursing entails an inability to clock out to the relief of next shift's nurse. In this way, unmanageable workloads may undermine efforts to create flexible scheduling options, particularly under the unpredictable conditions in which home health nurses work (Agbonifo et al., 2017; Bien et al., 2020).

Our findings on work hours suggest a need to address modifiable time-related factors to make workloads more manageable. For instance, unreasonable productivity demands, measured in home health by number of visits performed per day, have been linked to home health nurse turnover consideration (Ellenbecker et al., 2006) and job dissatisfaction (Narayan, 2023), meaning that clinicians may be asked to see too many patients per shift. Paperwork and documentation burdens, including the tool known as the Outcome and Assessment Information Set (OASIS) in US Medicare-reimbursed home health (Narayan, 2023; McCreary, 2020), have been cited as dissatisfying and deterrents to working in home health. Streamlining and reducing documentation redundancies could improve the work experiences of a large sector of US home health registered nurses. We encourage researchers to continue investigating the breakdown of work time and activities of home health



Source: National Sample Survey of Registered Nurses 2008, 2018

Fig. 1. Predicted probability of turnover by years in the nursing workforce for home health compared to hospital registered nurses.



Source: National Sample Survey of Registered Nurses 2008, 2018

Fig. 2. Predicted probability of turnover by weekly hours worked.

nurses to inform areas to make their work more efficient and less burdensome.

Our results connecting overtime to turnover may also relate to "schedule volatility," or variability in daily patient visits, which has been linked to home health nurse turnover (Bergman et al., 2021). For the proportion of home health registered nurses paid on a per-visit basis (18.51 % per the Hospital and Healthcare Compensation Service, 2022), such volatility would translate to both irregular hours and compensation, as nurses bear the cost of canceled visits and exposure to financial risks typically shouldered by the healthcare organization. Nurses may then be forced to take on additional work, potentially contributing to high patient load and overtime. In contrast, research in Canada has connected income stability to intention-to-stay in home health nurse positions (Tourangeau et al., 2017). Pay was only a modest predictor of turnover across both hospital and home health nurses in our study; although our measure of wage was adjusted for national inflation and controlled by region, it may still have overlooked local variations in compensation and cost of living which could influence home health nurses' experience of pay. Future investigations should further explore relationships between compensation, scheduling and turnover.

Finally, our findings are situated within a policy landscape that shapes the challenges and dynamics of home health nursing. We identified drivers of turnover in a time period defined by the 2020 installation of a Prospective Payment System, which transformed the home health work environment and may have contributed to nurse dissatisfaction. More recently, the 2020 the Patient-Driven Groupings Model (PDGM) has led to reduced therapy use through financial disincentives (Medicare Payment Advisory Committee, 2024), potentially shifting care demands to nurses beyond their training and scope of practice. These developments underscore the importance of monitoring registered nurse work experiences to promote care quality under evolving payment models.

4.1. Limitations

The study has several limitations. First, results are associative, not causative. Next, pooling data can obscure temporal changes. To address this, year was included as a time control variable in pooled models. We were also deliberate in pooling decisions, combining datasets only in which relevant US home health policy (ie., the Prospective Payment System) context was shared. We analyzed 2022 data separately due to both methodological constraints and contextual shifts in home health delivery, including a novel reimbursement system, and broader shifts across the nursing workforce, like the COVID-19 pandemic. Our analyses were also restricted to the variables available in the National Sample Survey of Registered Nurses, which may have overlooked important turnover predictors—such as workplace violence—which has risen among nurses (McLaughlin and Khemthong, 2024) and in home health in recent years (Lombardi et al., 2024). Key variable definitions also varied across years- specifically, turnover included turnover intention in 2008 and likely inflated estimates of turnover levels. To minimize bias, we coded our turnover variable along the most conservative timeframe available, 12 months versus one to three years. We encourage research that explores these concepts distinctly. The survey also exclusively samples registered nurses and excludes the licensed practical and vocational nurses who constitute a significant proportion of the home health nursing workforce (Smiley et al., 2023) and play key clinical and complementary roles to registered nurses (D'Errico and Lewis, 2010). Thus, our study could not capture the full range of workplace dynamics in US home health and practical application of our findings may vary by agency's staffing mix.

Finally, methodological challenges with the 2022 data hampered interpretability of our most recent data. However, research has suggested that the COVID-19 pandemic exacerbated longstanding workplace issues for registered nurses (Aiken et al., 2023). Our findings on turnover predictors from earlier years also align with more recent findings regarding contemporary issues affecting the home health nurse workforce. Specifically, reports of labor law enforcement issues, staffing shortages, and workload pressures in home health care (Ghezeljeh et al., 2022; Nakrem and Kvanneid, 2022; Nizzer et al., 2024; Tyler et al., 2021) are consistent with our findings on overtime and turnover. Collectively, this suggests that our findings may have ongoing relevance and could be considered in measures designed to support the home health registered nurse workforce.

5. Conclusion

Building a durable home health nursing workforce is important for the development of a healthcare infrastructure that effectively meets the needs of its patients. Without measures to improve work experiences of home health registered nurses, the workforce may dwindle. In our nationally representative sample of US nurses, we found that late career

tenure and long work hours were associated with turnover among home health registered nurses. While these findings are concerning given recent accelerations in job and career departure of US nurses, they also highlight key areas of actionable reform. For instance, enhanced and specialized training and efforts to meaningfully improve home health scheduling may serve to attract and retain new registered nurses to home health. Future research should continue to explore contemporary drivers of home health registered nurse turnover to reconcile workplace experiences with observed turnover rates, while searching for policy-focused solutions to build and sustain the nursing workforce of the growing home health industry.

CRediT authorship contribution statement

Zoe Samson: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Laura M. Wagner:** Writing – review & editing, Writing – original draft, Visualization, Supervision, Methodology, Conceptualization. **Lauren J. Hunt:** Writing – review & editing, Writing – original draft, Visualization, Supervision, Methodology, Investigation, Conceptualization. **Ulrike Muench:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of Generative AI and AI-assisted technologies in the writing process

When drafting revisions, the authors used ChatGPT to provide suggestions for clarity and readability. At times, adjustments were made to phrasing and sentence structure based on the tool's suggestions. No AI tools were used in a generative fashion. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijnurstu.2025.105301.

Data availability

Our analysis utilized data from a publicly available dataset, provided by the US Census Bureau and Health Resources and Services Administration: the National Sample Survey of Registered Nurses, survey years 2008, 2018 and 2022.

All data are available for download at the following URL: https://data.hrsa.gov/topics/health-workforce/nursing-workforce-survey-data

Data are available here in a variety of file formats. We utilized the STATA format with .dta extension. In 2008, that format was not available and it was necessary to convert ASCII format to STATA format. We are happy to provide the STATA code that we used to clean and analyze data.

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