

PROMOTING PHYSICAL ACTIVITY AMONG FEMALE PATIENTS FOLLOWING CARDIAC REHABILITATION

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Background

- Heart disease leading cause of death in both men and women
- Cardiac rehabilitation provides secondary and tertiary prevention- however gains are typically not maintained after discharge
- Women are less likely to meet cardiac rehab goals and less likely to maintain physical activity behavior
- Women are exceedingly understudied during and after cardiac rehab

Care partner involvement

- Connection to supportive others can promote physical activity self-management
- Care partner involvement can help individuals overcome adherence-related challenges and maintain healthy behaviors.
- Care partner involvement is most often examined within spousal dyads.
- Most research focuses on married men with female care partners, despite gender disparities in the cardiac continuum of care.

Purpose

Pilot study to examine characteristics and support exchanges of female patients and their care partners following participation in cardiac rehabilitation.

Aims:

Identify role relationships of care partners involved in helping female patients manage heart disease

Explore care partner involvement in promoting heart disease management of female patients

Study protocol

- The total sample of 54 female patients managing heart disease included those who 1) had participated in outpatient cardiac rehabilitation; and were 2) 40 years of age or older, 3) residing in the United States, and 4) able to read and respond in English.
- Participants identify (up to 3) close others who help with managing their heart disease, including person most involved (i.e., primary care partner).
- Report care partner characteristics such as relationship (e.g., adult child, spouse), living arrangement, and involvement in disease management routines (e.g., exercise, diet).

Women with Heart Disease and Care Partner Characteristics (N=54)

Characteristic	Spouse Care Partner (n=27) n (%) or M(SD)	Non-spouse Care Partner (n=27) n (%) or M(SD)
Women age, years**	59.7 (9.8)	68.7 (11.9)
Women marital status (% married)***	26 (96.3%)	10 (37.0%)
Women self-rated health		
Excellent/very good	6 (22.2%)	11 (40.7%)
Good/fair/poor	21 (77.8%)	16 (59.3%)
Employment status (% yes)*	17 (63.0%)	9 (33.3%)
Race (% White)	26 (96.3)	25 (92.6%)
Women physical function		
Can perform all activities without SOB	8 (29.6%)	5 (18.5%)
Becomes SOB with strenuous activities	13 (48.1%)	17 (63.0%)
Becomes SOB with daily activities	6 (22.2%)	5 (18.5%)
Care partner gender (% female)***	2 (7.4%)	17 (63.0%)
Living arrangement (% reside together)***	24 (88.9%)	7 (25.9%)
Relationship quality	6.7 (0.5)	6.7 (0.5)

Care Partner Involvement in Health-Related Activities (Participant Reports)

	Spouse Care Partner (n=27)	Non-spouse Care Partner (n=27)
Health-related activity	n (% yes)	n (% yes)
Help you maintain healthy diet	19 (70.4%)	18 (66.7%)
Help you maintain regular exercise	21 (77.8%)	16 (59.3%)
Help you monitor B/P	8 (29.6%)	11 (40.7%)
Accompany you to HCP visits	17 (63.0%)	14 (51.9%)

Results

➤ Care partner relationship

spouse ($n = 27$, 50%)

another network member (50%), adult child ($n = 17$), sibling ($n = 3$),
or friend ($n = 7$)

➤ Care partner involvement in health-related activities

Contrary to expectation, no significant difference was detected in involvement of spouse and non-spouse care partners in women's health-related activities

maintaining healthy diet, regular exercise, monitoring blood pressure, attending healthcare visits.

Discussion

- Among women managing heart disease, half identified their spouse as their primary care partner, while the other half identified a non-spouse care partner (e.g., adult child, sibling, or friend).
- Some married women (37%) identified someone other than their spouse as their primary care partner.
- Women with non-spouse care partners were significantly older, more likely to report a female care partner, and less likely to live with their care partner compared to those with spouse care partners.
- No significant differences were found between spouse and non-spouse care partners in helping women with their health-related activities.

Implications

- Implications for cardiac rehabilitation and intervention include expanding efforts to recognize and engage non-spousal care partners in supporting women's heart health.
- Leveraging the involvement of members of women's broader social network can galvanize available support for disease management, ultimately improving health outcomes and quality of life for women with heart disease.

Collaborators

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The U.S. Nursing Shortage

A Data Briefing on Statistics, Impacts & Solutions

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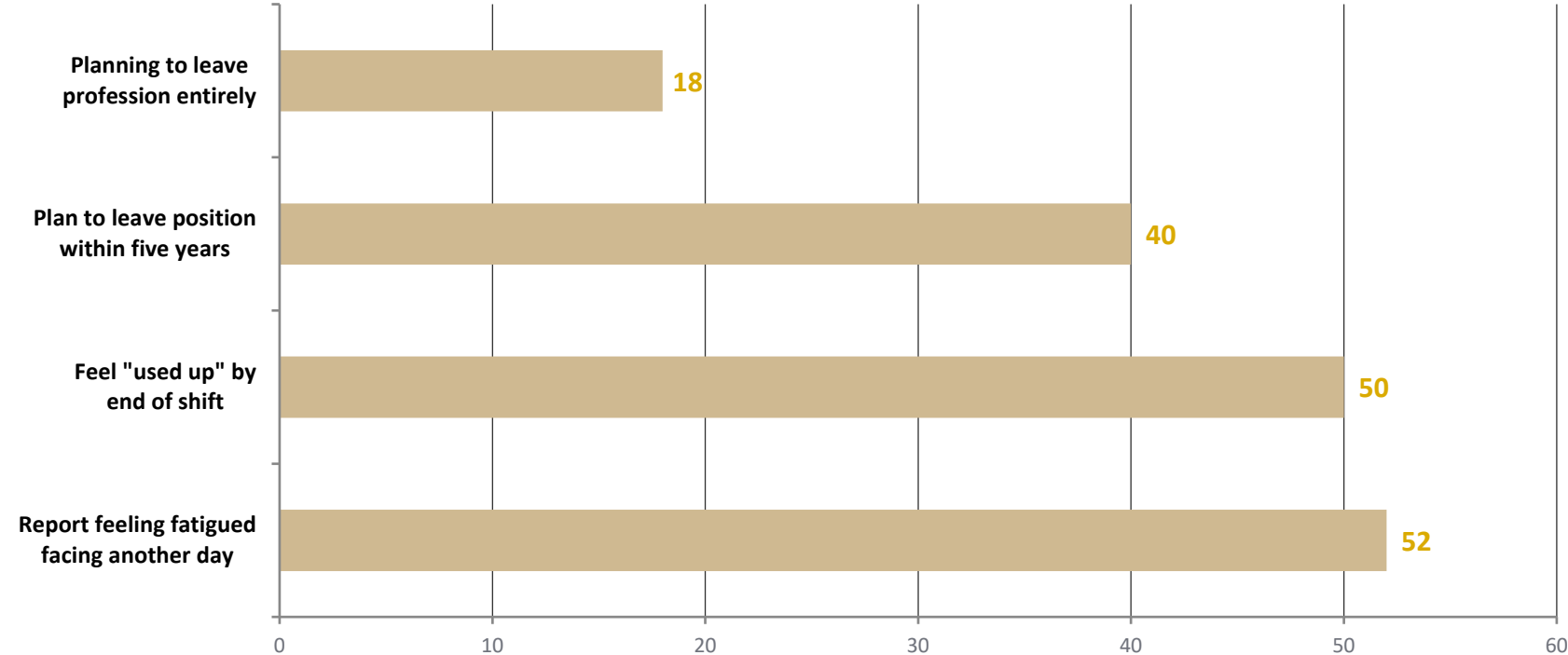
College of Health and Human Sciences

Scope of the Crisis: Key Workforce Indicators

Indicator	Value
RN job growth, 2023–2033	+6% (~195,000 positions)
NP job growth, 2023–2033	+46% (~135,500 jobs)
Projected RN shortage by 2030	63,720 full-time RNs
Qualified applicants turned away (2024)	80,000+
RNs over age 45	60% of current workforce

Note: RN growth is driven primarily by replacement demand (retirements) and population aging. NP growth reflects expanded scope-of-practice legislation and primary care access gaps in underserved areas.

Nurse Burnout Indicators: Survey Data, 2025



Workplace Violence

Nurses are 5x more likely to experience violence at work than any other profession

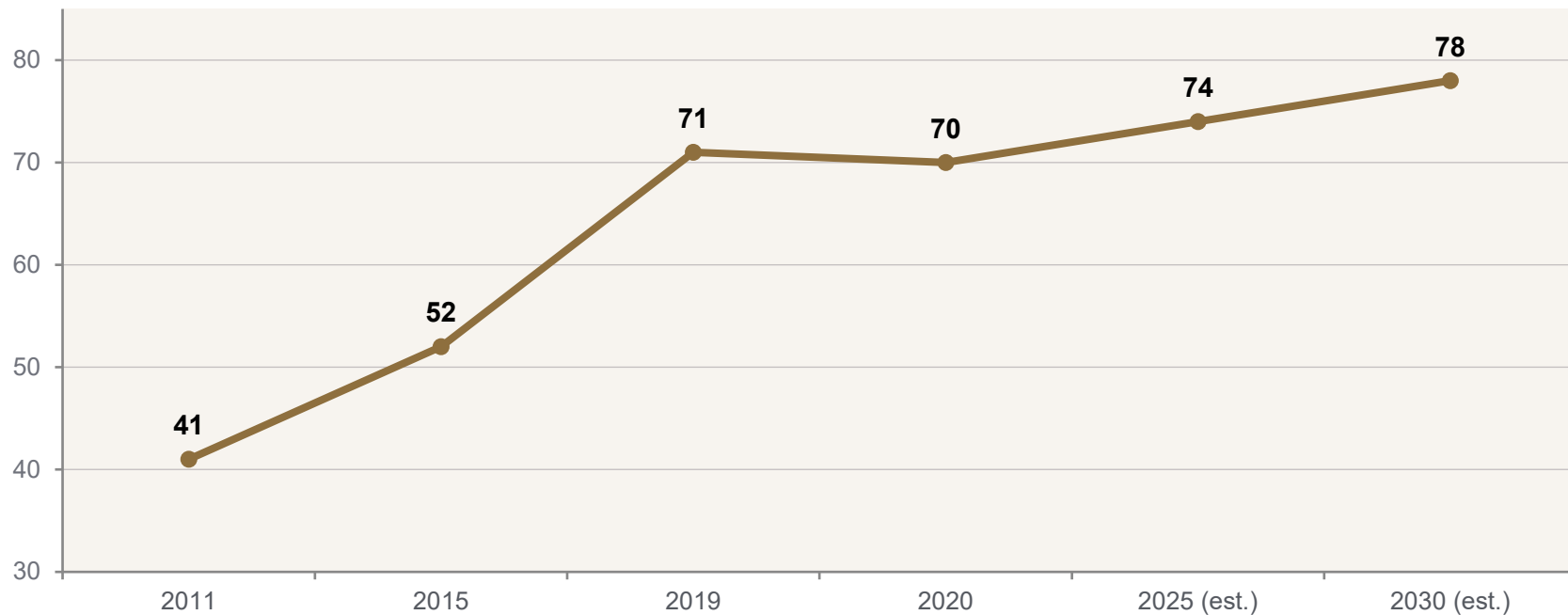
- **70–80% of workplace violence incidents** in healthcare are perpetrated by patients or visitors.
- **~50% of nurses** report experiencing physical violence from patients during their careers.
- **Verbal abuse rates exceed 60–90%** in many studies.
- High-risk settings:
 - Emergency departments
 - Psychiatric/behavioral health
 - Intensive care units
 - Long-term care



Workforce Demographics & Retirement Pipeline

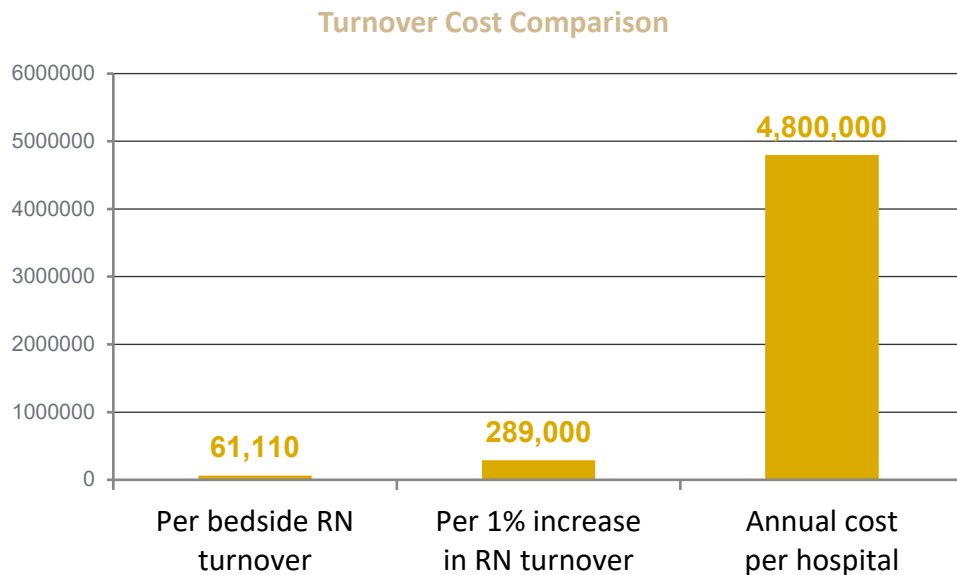
Demographic Factor	Figure	Implication
Current RNs over age 45	60%	Majority of workforce approaching retirement eligibility
RNs over age 50	~50%	Accelerated retirement wave expected within 5–10 years
Projected nurse retirements by 2030	>1,000,000	Loss of experienced professionals, institutional knowledge
U.S. population age 65+ in 2011	41 million	Baseline before baby boomer retirement surge
U.S. population age 65+ in 2019	71 million	73% increase in eight years; trend continues
U.S. population age 65+ by 2030 (est.)	73–78 million	Demand for geriatric and chronic care nursing rises sharply

U.S. Population Age 65+: Growth Trajectory, in Millions



This 73% increase in the 65+ cohort between 2011 and 2019 drives demand for geriatric care, chronic disease management, and long-term care nursing — precisely the specialties most affected by workforce shortages.

Turnover Costs & Patient Safety Impact



Patient Safety Data

Recommended ratio	1:4 (nurse:patient)
Mortality risk per additional patient	+7%
Annual hospital cost (agency reliance)	\$5M-\$8M
RN turnover rate (high-burnout orgs)	≥12%
Global annual nurse departures	260,000+

Understaffing creates a self-reinforcing cycle: turnover increases workloads, which accelerates burnout and further turnover.

Shortages by State

According to HRSA, the nursing shortage varies considerably from state to state. Some states are projected to face much larger gaps in RN supply compared to demand by 2037. The following ten states are expected to experience the highest projected shortages:

- **North Carolina:** 22%
- **Washington:** 22%
- **Maryland:** 20%
- **South Carolina:** 19%
- **Michigan:** 19%
- **New Mexico:** 19%
- **Oklahoma:** 18%
- **California:** 18%
- **Idaho:** 17%
- **Georgia:** 17%

RN Adequacy by State

State	2025 Supply	2025 Demand	2025 Adequacy	2037 Adequacy
Illinois	121,700	116,130	105%	108%
Ohio	120,690	122,640	98%	118%
Indiana	65,570	67,310	97%	99%
Michigan	86,090	102,000	84%	81%
Tennessee	60,580	72,070	84%	95%
Kentucky	39,890	49,470	81%	101%
Iowa	25,350	32,020	79%	97%
Idaho	10,940	17,570	62%	83%

The Education Pipeline: Capacity Constraints

Pipeline Constraint	Data Point	Detail
Qualified applicants turned away (2024)	80,000+	Insufficient faculty, clinical sites, classroom space, and funding
Qualified applicants turned away (2023)	65,766	Per AACN; consistent year-over-year capacity shortfall
Nursing schools seeking new faculty	82%	Per AACN survey; indicates systemic faculty pipeline failure
Faculty shortage root causes	Multiple	Budget constraints, aging faculty, competition from clinical pay
Faculty pay vs. clinical pay gap	Significant	Nursing educators earn substantially less than clinical practitioners
Rural RN workforce share	16%	Serves 52+ million Americans; disproportionate access gap

Evidence-Based Strategies: Expanding Educational Pipeline

Strategy	Detail / Evidence
Increase program capacity	University–healthcare–government partnerships to fund seats, clinical sites, and simulation labs
Incentivize nurse educators	Address pay gap between faculty and clinical roles through salary supplements and loan forgiveness
Expand clinical training sites	65,766 applicants turned away in 2023 due in part to insufficient clinical placements (AACN)
Promote nursing careers	Targeted outreach to younger and second-career populations; scholarship funding
International recruitment	Direct-hire programs for foreign-educated nurses as a long-term supplementary strategy

Federal involvement

On the eve of National Nurses Week, the Department of Education released its final rule, set to take effect on July 1, 2026, that excludes nursing from its definition of professional degree programs.

“Reimagining and Improving Student Education - Federal Student Loan Program Final Regulations”

Despite thousands of comments from the nursing community and the public, pushback from more than **150 bipartisan members of Congress**, and a demonstrated need for nurses across the healthcare workforce, the DoE made it clear that it does not consider nursing to be a professional degree.

Starting July 1, 2026, new federal loan rules, part of the RISE rule, cap graduate nursing students at **\$20,500 annually** and **\$100,000 total** in federal loans. Nursing is classified as a general graduate program, not a "professional" program, meaning they are ineligible for the higher \$50,000 annual/\$200,000 aggregate limits applied to medical/law/pharmacy schools.

Guess who didn't advocate?

Department of Education noted that the following programs were professional:

- Medicine, including DO
- Pharmacy
- Law
- Dentistry
- Optometry
- Veterinary medicine
- Podiatry
- Chiropractic
- Theology
- Clinical psychology

**This meant that
nurses, nurse
practitioners,
physical therapists,
physician
assistants, and
audiologists were
excluded**

Evidence-Based Strategies: Retention & Workforce Optimization

Strategy	Detail / Evidence
Continuous feedback	Real-time nurse engagement data to identify dissatisfaction before turnover occurs
Onboarding & mentorship	Structured programs reduce early-career attrition; address 90-day turnover risk
Mental health support	Evidence-based wellness programs, not performative; address root causes of burnout
Safe staffing ratios	Maintain 1:4 nurse-to-patient ratio; each additional patient raises mortality risk 7%
Real-time staffing models	Dynamic, data-driven frameworks that adjust nurse-to-patient ratios minute-by-minute or shift-by-shift rather than relying on static, traditional schedules

New Nursing & Pharmacy Education Building

Open for classes January 2027

Advanced Simulation Labs

XR / VR Training

Expanded Enrollment
Capacity

Interprofessional Education

Research Space

What's going in this new building?

Classrooms

- 240p tiered collaborative
- 186p tiered collaborative
- 108p flat floor active
- 108p flat floor active
- 32p active
- 48p active

Grab and Go Cafe

Skills and Assessment Lab

- 10 skills bays
- 10 assessment bays

Simulation Center

- 8 flex/med-surg rooms
- 1 two-bed, IPE room
- 1 homecare suite
- 2 mental health consult rooms
- 1 30-person VR room

Student Collaboration Space

Offices

- Nursing
 - 60 private office
 - 10 shared
 - 15 open assigned workstations
 - 1 open shared workstation
 - 12 graduate student workstations
- Pharmacy
 - 23 private office
 - 3 shared
 - 22 open assigned workstations
 - 1 open shared
 - 12 graduate student workstations

Health and Behavior Research Space

- One focus group room for 20 people
- Three secure meeting rooms for 10 people

Nuclear Pharmacy Lab

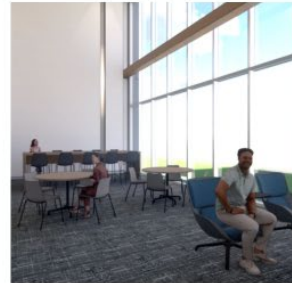
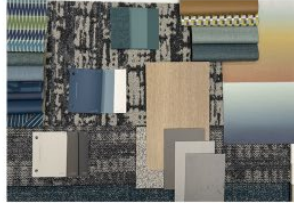
Pharmacy OSCE suite

Nursing Executive Suite

Pharmacy Executive Suite

Nursing Pharmacy Education Building Updates

Move in December 2026; Classes January 2027



PURDUE
UNIVERSITY.

3/31/23

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Summary & Outlook

The U.S. faces a structural nursing shortage driven by converging demographic, educational, and workforce factors. Over 1 million nurses are projected to retire by 2030 while the 65+ population will exceed 78 million. The education pipeline cannot keep pace, and turnover costs hospitals \$4.8 million annually.

Addressing this crisis requires coordinated action across educational investment, workforce retention, and evidence-based staffing practices.

Data Sources

People Element. (2025). 2025 Nursing Shortage Statistics. <https://peopleelement.com/blog/nursing-shortage-statistics-2025/>
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