

Article

Not peer-reviewed version

Role Clarity Among Patient Care Technicians in Saudi Arabia: Outcomes of a Structured Educational Program

[Nashi Masnad Alreshedi](#) , [Afaf Mufadhi Alrimali](#) * , Wadida Darwiesh Alshammari , Kristine Angeles Gonzales , Maram Nasser Alawad , Eida Habeeb Alshammari , Mohmmad Khalf Al-Shammari , Ohoud Awadh Alreshidi , [Fawziah Nasser Alrashedi](#) , Asrar Eid Alrashedi , Lueife Ali Alrashedi

Posted Date: 20 November 2025

doi: 10.20944/preprints202511.1590.v1

Keywords: Patient Care Technicians; nursing assistants; healthcare assistants; role clarity; scope of practice; education



Preprints.org is a free multidisciplinary platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This open access article is published under a [Creative Commons CC BY 4.0 license](#), which permit the free download, distribution, and reuse, provided that the author and preprint are cited in any reuse.

Disclaimer/Publisher's Note: The statements, opinions, and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions, or products referred to in the content.

Article

Role Clarity Among Patient Care Technicians in Saudi Arabia: Outcomes of a Structured Educational Program

Nashi Masnad Alreshedi ¹, Afaf Mufadhi Alrimali ^{1,*}, Wadida Darwiesh Alshammari ¹, Kristine Angeles Gonzales ¹, Maram Nasser Alawad ², Eida Habeeb Alshammari ³, Mohammad Khalf Al-Shammari ⁴, Ohoud Awadh Alreshidi ⁵, Fawziah Nasser Alrashedi ⁶, Asrar Eid Alrashedi ¹ and Lueife Ali Alrashedi ⁷

¹ Nursing Executive Administration, Hail Health Cluster, Hail, Saudi Arabia

² Academic Affairs and Training and Research Center, Hail Health Cluster

³ Maternity and Children's Hospital, Hail Health Cluster, Hail, Saudi Arabia

⁴ Erada Complex for Mental Health Hospital, Hail Health Cluster, Hail, Saudi Arabia

⁵ King Salman Specialist Hospital, Hail Health Cluster, Hail, Saudi Arabia

⁶ Cardiac Center, Hail Health Cluster, Hail, Saudi Arabia

⁷ Ghazalah Hospital, Hail Health Cluster, Hail, Saudi Arabia

* Correspondence: Afafalrimali@gmail.com

Abstract

Objectives: Role clarity is a persistent challenge among Patient Care Technicians (PCTs), contributing to inconsistent task performance and safety risks. In Saudi Arabia, little is known about PCTs' understanding of their responsibilities. This study assessed baseline knowledge and evaluated the impact of a targeted educational program aimed at improving clarity in roles, safety practices, and communication. **Methods:** A quasi-experimental pre-post design was used in September 2025 with 35 participants from the Hail Health Cluster. The one-day intervention included lectures, discussions, role-play, and case scenarios. A validated survey assessed four domains: role clarity, core clinical tasks and safety, communication and ethics, and objective knowledge. Paired t-tests were performed using SPSS v29, with effect sizes reported via Cohen's d. **Results:** Baseline scores were lowest in objective knowledge (41.4%) and role clarity (62.8%). Post-training, total composite scores improved significantly (+10.88%, $p < .001$), with the greatest gain in objective knowledge (+19.8%, $p < .001$). Role clarity showed only a modest, non-significant increase (+3.98%, $p = .088$). No demographic differences were found. **Conclusion:** Training enhanced PCT knowledge, but improving role clarity may require longer-term, system-level strategies.

Keywords: Patient Care Technicians; nursing assistants; healthcare assistants; role clarity; scope of practice; education

Background

The Patient Care Technician (PCT) in Saudi Arabia is a supportive clinical role that provides direct patient care under the supervision of a registered nurse. Internationally, similar positions are referred to as nursing assistants, nursing aides, or healthcare assistants (Blay & Roche, 2020). Although the titles and regulatory frameworks for these roles vary widely, their core function is consistent: assisting with basic clinical procedures, daily living activities, or basic observations essential to patients' outcomes (Jackson et al., 2024). As a measure to avoid confusion in narration within this paper, the term *healthcare assistants* (HCAs) is used when discussing international literature, and the term *Patient Care Technician (PCT)* is used when referring to the Saudi context.

Globally, the employment of HCAs has expanded in response to persistent shortages of licensed nurses, rising patient acuity, and cost pressures (Jackson et al., 2024; Kagonya et al., 2023). Health systems increasingly rely on these roles to reduce the workload of registered nurses and sustain patient care delivery (Duffield et al., 2019). Recent reports show that HCAs represent one of the largest healthcare occupations, with more than 1.4 million employed in the United States alone in 2024 (U.S. Bureau of Labor Statistics, 2024). While international comparisons are complicated by differences in titles and regulations, the global trend reflects heavy reliance on unregulated staff (Griffiths et al., 2023). In Saudi Arabia, supportive roles resembling PCTs existed for years, but without formalized training or a clear scope. The Saudi Commission for Health Specialties (SCFHS) has since introduced a structured one-year PCT program through the Health Academy, which now serves as the main source of graduates entering the workforce (SCFHS, 2022). In the Hail Health Cluster, most PCTs are employed with less than three years of experience, reflecting the recency of the program and the limited number of graduates available.

The heavy reliance on unregulated staff sometimes occurs at the cost of increased risks when training and role boundaries are unclear (Griffiths et al., 2023). Preparation for HCAs worldwide varies greatly, ranging from no formal training to short programs lasting a few weeks (Duffield et al., 2019; Saiki et al., 2020). The absence of consistent standards in education and regulation has been linked to inconsistent performance, role overlap, and risks to patient safety (Blay & Roche, 2020). A recent integrative review identified that limited training, unclear scope definitions, and low nurse confidence in assistants are among the primary barriers to effective delegation, which are linked to missed care and adverse outcomes (Crevacore et al., 2023). When delegation frameworks are unclear, assistants may also become uncertain about their responsibilities, resulting in confusion and compromised care (Walker et al., 2021). Ambiguity in role boundaries also directly undermines communication. Nurses' perceptions of assistants strongly influence how they share information and engage in collaboration. More positive perceptions are associated with higher frequency of communication behaviors such as asking, expressing, feedback, and responsiveness (Saiki et al., 2020). At the same time, assistants often aspire to a broader set of responsibilities than they believe nurses expect of them, and a misalignment between these expectations and their perceived roles tends to reduce their participation in team processes (Saiki et al., 2021). A recent qualitative study of HCAs' dyads also found that role demarcation is heavily shaped by ward culture and interpersonal negotiation, reinforcing the importance of formal agreement on roles to avoid conflict or task duplication (Carroll et al., 2024).

Clarity alone is not sufficient; it must be reinforced by how teams are led and organized. Clear role definitions, supportive supervision, and development opportunities are consistently associated with better job satisfaction and care quality, while nurse coaching enhances assistants' competence, confidence, and teamwork, especially when supervisors respect autonomy and adapt communication (Van Kuppenveld et al., 2023). A systematic review of clinical supervision across healthcare settings showed that effective supervision is associated with reduced burnout and greater staff retention, while poor supervisory support contributes to stress and turnover (Martin et al., 2021). **In addition to these organizational factors**, working conditions also influence the performance and well-being of HCAs. Systematic reviews report that, in addition to persistent role ambiguity, heavy workloads and emotional stress contribute to burnout, injuries, and reduced job satisfaction among HCAs (Huang et al., 2025). Evidence shows that younger, less experienced assistants are particularly vulnerable to burnout and stress (Norful et al., 2024). This body of research underscores that role clarity must be reinforced through structured supervision, team-based communication strategies, and healthy working conditions to maximize the contributions of HCAs.

Educational interventions targeting role clarity have been associated with improved confidence, communication, and adherence to safety protocols across healthcare teams (Buljac-Samardzic et al., 2020; Kilpatrick et al., 2020). Brief interventions that explicitly outline job duties and boundaries help clarify what tasks PCTs are responsible for and how they relate to the broader nursing team, and can significantly improve role clarity (Munn et al., 2011). Targeted patient safety workshops have been

shown to significantly improve HCAs' awareness; for example, one study found that even a brief training session yielded greater confidence in incident handling and a reduction in adverse events (Kantaris et al., 2020), while another trial reported significantly higher post-intervention knowledge and self-rated competence among trained HCAs (Cheong & Hsu, 2021).

Clear role understanding is therefore a cornerstone of effective healthcare teamwork (Campbell et al., 2021). When PCTs are knowledgeable about their responsibilities and boundaries, they are better equipped to provide safe, efficient, and patient-centered care. Research on PCTs' roles is underdeveloped compared to studies on professional nurses and other healthcare workers (Huang et al., 2025). And no evidence has been identified from Saudi Arabia or the wider Middle East, underscoring a significant gap in the literature and the need for context-specific research on PCTs. **This study seeks to address this gap by evaluating PCTs' knowledge of their roles and job descriptions in Saudi Arabia. A structured one-day educational program was delivered, and knowledge was assessed using a validated survey administered before and after the training. By doing so, the study aims to generate local evidence on PCT role clarity and the effectiveness of targeted education.**

Methods

Study Design

This study employed a quasi-experimental pre–post design to evaluate the effect of a structured educational program on PCTs' knowledge of their roles and job descriptions. The intervention consisted of a one-day training workshop, and knowledge was assessed using a validated survey administered before and after the program.

Setting and Participants

The study was conducted in September 2025 in the Hail Health Cluster, Saudi Arabia. Employed participants worked across multiple secondary and tertiary hospitals within the cluster, which has recently integrated PCT graduates from the SCFHS program, most of whom had less than three years of experience. The study population included both employed PCTs (n=18) and PCT trainees (n=17) who were still undergoing their training. The inclusion of trainees was intentional, aimed at supporting capacity-building and promoting standardized knowledge of role boundaries early in their career pathway. Eligible participants were certified PCTs actively working in inpatient or outpatient settings, as well as PCT trainees currently enrolled in the SCFHS program. PCTs on extended leave or those who declined participation were excluded. Recruitment was facilitated through the Nursing Offices in each hospital via email and departmental announcements, while trainees were invited through coordination with the Academic Center in Hail.

Sample size was calculated using G*Power software based on Cohen's (1992) guidelines for an independent-samples t-test, assuming a medium effect size ($d = 0.5$), $\alpha = 0.05$, and statistical power of 0.80. The minimum required sample size was 34 participants. In this study, 35 PCTs completed both the pre- and post-intervention surveys, meeting the calculated requirement and ensuring sufficient statistical power for the planned analyses.

Educational Intervention

The intervention was a structured, one-day educational workshop designed collaboratively by nurse educators and clinical supervisors, following the SCFHS PCT curriculum. Delivered over eight hours, the workshop used a blended instructional format combining didactic teaching, small-group discussions, role-playing exercises, and interactive case scenario simulations to promote engagement and real-world application. The program is accredited by the American Nurses Credentialing Center (ANCC), a subsidiary of the American Nurses Association, which is internationally recognized for setting standards in nursing education and credentialing.

The curriculum was delivered through four core modules, supplemented by additional thematic sessions:

1. **Professional Responsibilities and Scope of Practice**

Covered PCT role definitions, boundaries of delegation, tasks requiring nurse oversight, and escalation protocols for changes in patient condition. Accountability and time management strategies were emphasized to strengthen personal responsibility and daily workflow efficiency.

2. **Patient Safety and Clinical Competence**

Addressed infection control (e.g., hand hygiene, PPE use), error reporting, and response to patient deterioration and emergencies. This module also included essential clinical skills training (vital sign measurement, hygiene support, mobilization, and documentation) reinforced through demonstrations.

3. **Communication, Ethics, and Teamwork**

Introduced structured communication tools such as SBAR, professional documentation standards, and patient confidentiality. Dedicated sessions on interprofessional collaboration and handover communication were reinforced through simulated emergencies and team-based exercises. Empathy and emotional support techniques were practiced using patient-centered role-play scenarios.

4. **Humanistic and Culturally Sensitive Care**

Integrated sessions on humanity in care delivery, including respect for patient dignity, family involvement, and religious considerations relevant to Saudi clinical settings. Group activities and case discussions allowed participants to explore ethical challenges and culturally respectful behavior in care delivery.

Educational materials included printed handouts, visual presentations, and hands-on activities. Facilitators guided scenario-based learning tailored to common ward situations, encouraging reflection and problem-solving.

Data Collection Tools

Knowledge of roles and job descriptions was measured using a survey developed specifically for this study. Guided by domains highlighted in prior research on HCAs' roles, scope boundaries, safety practices, communication and documentation standards, and professional conduct. Constructs and candidate items were mapped to established domains, then refined for coverage, clarity, and alignment with hospital practice.

The instrument consisted of four sections. The demographic section captured participant characteristics such as age, gender, employment status (employed or trainee), years of experience, area of work, and prior training. Section A included Likert-scale items (1 = strongly disagree to 5 = strongly agree) that assessed role clarity and boundaries (7 items), focusing on the scope of practice, tasks requiring nurse supervision, escalation of patient changes, and perceptions of role ambiguity. Section B examined core tasks and safety practices (7 items), including vital signs measurement, assistance with activities of daily living, infection prevention, and emergency response. Section C addressed communication, documentation, ethics, and teamwork (9 items), covering confidentiality, reporting practices, and patient interaction. Section D included (14 items) scored as true, false, or "don't know," which tested factual knowledge of role boundaries, patient safety, and professional conduct. The survey was administered twice: once before the educational intervention (pre-test) and again immediately after completion of the program (post-test).

Face and Content validity were ensured through expert review by nursing educators. Construct validity was supported by aligning the survey domains with the core competencies and job descriptions defined in the SCFHS PCT curriculum. Reliability was evaluated via a test-retest procedure with 10 pilot PCTs completing the tool twice, two weeks apart, to assess clarity, cultural relevance, and comprehension. The resulting correlation coefficients indicated strong temporal stability: 0.84 for Role Clarity & Boundaries, 0.81 for Core Tasks, Safety & Infection Prevention, and 0.89 for the Knowledge Test. Internal consistency was also acceptable to strong, with Cronbach's α

values of 0.89 (Role Clarity & Boundaries), 0.79 (Core Tasks, Safety & Infection Prevention), 0.73 (Communication, Documentation, Ethics & Teamwork), and 0.75 (Knowledge Test). The overall 37-item scale yielded a Cronbach's α of 0.86.

Coding, Scoring, and Transformation

All attitudinal/practice items were coded so that higher scores reflected clearer roles, safer practice, and stronger communication/ethics. Negatively phrased items (for example, pressure to work beyond scope) were reverse-coded before aggregation. Each section's items were averaged to yield a raw section score. To place sections on a common 0–100 metric, raw means were linearly transformed to percentages based on the response range; this enabled direct comparison across sections. The Knowledge test was scored objectively: correct answers received one point, while incorrect and "Don't know" received zero; the total correct was then expressed as a percentage of 14 items. An overall composite percentage was calculated at pre- and post-training as the mean of the four section percentages, and individual improvement was computed as Post – Pre in percentage points for each section and for the overall composite.

Statistical Analysis

All analyses were performed in IBM SPSS Statistics, version 29.0. Section scores were computed when all required items for that section were present after coding; analyses used listwise deletion within each section and did not apply imputation. Paired t-tests compared pre- and post-training scores for each section and for the overall composite. To examine whether improvement varied by participant characteristics, one-way ANOVAs were used to test the association between change scores and demographic/professional factors (gender, age group, employment status, years of experience, area of work, orientation, refresher training, and whether the job description had been read in the last 12 months). Effect sizes and p-values were highlighted for statistically significant results, while nonsignificant patterns were summarized to maintain transparency.

Results

Sample Characteristics

The analytic sample comprised 35 Patient Care Technicians. Most participants were female, as females constituted 88.6% ($n = 31$) and males 11.4% ($n = 4$). The age distribution was young overall: 80.0% were 20–29 years ($n = 28$), 14.3% were 30–39 years ($n = 5$), and 5.7% were 40–49 years ($n = 2$). All participants held a bachelor's degree (100%). Employment status was nearly balanced, with 51.4% employed staff ($n = 18$) and 48.6% trainees ($n = 17$). By experience, 51.4% reported 1–3 years ($n = 18$) and 48.6% were trainees for whom years of experience did not apply ($n = 17$).

With respect to work setting, 34.3% worked in inpatient units ($n = 12$), 11.4% in outpatient clinics ($n = 4$), 5.7% in critical care ($n = 2$), and 48.6% were trainees without a fixed placement ($n = 17$). Orientation had been received by 45.7% ($n = 16$), while 5.7% ($n = 2$) had not, and 48.6% were trainees ($n = 17$). Refresher training in the previous 12 months was split evenly between "yes" and "no" (25.7% each; $n = 9$ for both), with the remaining 48.6% being trainees ($n = 17$). Most respondents reported having read their job description in the last 12 months (77.1%, $n = 27$), whereas 22.9% had not ($n = 8$) (Table 1).

Table 1. Participant demographic and professional characteristics ($n = 35$).

Variable	Category	Count (%)
Gender	Female	31 (88.6%)
	Male	4 (11.4%)
Age group - years	20–29	28 (80.0%)
	30–39	5 (14.3%)

	40–49	2 (5.7%)
Education level	Bachelor's degree	35 (100.0%)
Employment status	Employed	18 (51.4%)
	Trainee	17 (48.6%)
Years of experience	1–3 years	18 (51.4%)
	Does not apply (trainee)	17 (48.6%)
Area of work	Critical care unit (e.g., ICU, CCU, etc.)	2 (5.7%)
	Does not apply (trainee)	17 (48.6%)
	In-patient (e.g., Medical, Surgical, etc.)	12 (34.3%)
	Outpatient	4 (11.4%)
Orientation received	Yes	16 (45.7%)
	No	2 (5.7%)
	Does not apply (trainee)	17 (48.6%)
Refresher training in the last 12 months	Yes	9 (25.7%)
	No	9 (25.7%)
	Does not apply (trainee)	17 (48.6%)
Read job description in the last 12 months	Yes	27 (77.1%)
	No	8 (22.9%)

Section-Specific Pre- and Post-Training Changes

Section A (role clarity and boundaries) showed a small, non-significant mean increase from 62.76% (SD 10.37) pre-training to 66.74% (SD 12.33) post-training. The mean difference was +3.98 percentage points, the 95% CI ranged from -0.63 to 8.59, and the paired t-test did not reach statistical significance ($t(34) = 1.76, p = .088$). Although the point estimate favored improvement, the confidence interval included zero. Section B (core tasks, safety, and infection prevention) demonstrated a large and statistically significant gain. Scores rose from 79.39% (SD 9.05) to 92.96% (SD 10.16), yielding a mean difference of +13.57 (95% CI 9.38 to 17.77). The effect was robust on the paired test ($t(34) = 6.57, p < .001$). Section C (communication, documentation, and ethics) improved from 80.40% (SD 11.75) to 86.59% (SD 8.74). The mean difference was +6.19 (95% CI 1.49 to 10.89), and the paired comparison was statistically significant ($t(34) = 2.68, p = .011$). Section D (objective knowledge test) showed the largest absolute increase. Scores increased from 41.43% (SD 9.92) to 61.22% (SD 15.23), a mean gain of +19.80 (95% CI 12.93 to 26.66), with strong statistical evidence ($t(34) = 5.86, p < .001$). The overall composite score rose from 65.99% (SD 5.74) to 76.88% (SD 6.46). The mean change was +10.88 (95% CI 8.59 to 13.18) and was statistically significant ($t(34) = 9.65, p < .001$) (Table 2).

Table 2. Section-specific pre- and post-training scores with paired t-tests (n = 35).

Outcome	Pre Mean \pm SD	Post Mean \pm SD	Mean Δ (Post-Pre)	95% CI for Δ	t (df=34)	p-value
Role clarity & boundaries (%)	62.76 \pm 10.37	66.74 \pm 12.33	+3.98	-0.63 to 8.59	1.76	.088
Core tasks, safety & infection prevention (%)	79.39 \pm 9.05	92.96 \pm 10.16	+13.57	9.38 to 17.77	6.57	<.001
Communication, documentation & ethics (%)	80.40 \pm 11.75	86.59 \pm 8.74	+6.19	1.49 to 10.89	2.68	.011
Knowledge test score (%)	41.43 \pm 9.92	61.22 \pm 15.23	+19.80	12.93 to 26.66	5.86	<.001
Overall composite score (%)	65.99 \pm 5.74	76.88 \pm 6.46	+10.88	8.59 to 13.18	9.65	<.001

Change in the Overall Composite Score by Participant Factors

Differences by group in overall improvement (post-pre) were explored using one-way ANOVA. None of the tested factors showed statistically significant variation in mean improvement at the $\alpha = .05$ level.

By gender, females improved by a mean of 11.14 points and males by 8.88 points; the difference was not significant ($F = 0.401, p = .531$). By age, mean improvements were 10.59 (20–29 years), 11.49

(30–39 years), and 13.49 (40–49 years); variance across age groups was not significant ($F = 0.191$, $p = .827$). Employment status showed comparable gains for employed staff (10.70) and trainees (11.04), with no significant difference ($F = 0.021$, $p = .885$). Years of experience followed the same pattern, with 10.70 for those with 1–3 years and 11.06 for trainees ($F = 0.025$, $p = .874$).

Across work areas, mean improvements were 16.07 in critical care, 11.41 in outpatient, 9.76 in inpatient wards, and 10.95 among trainees without a fixed unit. Although the point estimate was highest in critical care, the overall test did not show a significant difference ($F = 0.503$, $p = .683$). Orientation status showed a numerically larger improvement among those without orientation (20.19) compared with those oriented (9.65) and trainees (10.95), but this contrast did not reach significance ($F = 2.398$, $p = .107$). Refresher training in the previous year was not associated with differential gains (means 12.19 with refresher, 9.46 without, 10.95 for trainees; $F = 0.365$, $p = .697$). Reading the job description in the previous 12 months yielded similar improvements (11.21 vs 9.80; $F = 0.270$, $p = .607$). The improvement appeared broadly distributed across subgroups, with no single demographic or professional factor showing a statistically distinct pattern of change in the composite outcome (Table 3).

Table 3. Improvement in overall composite score (Post–Pre) by participant factors (one-way ANOVA; $n = 35$).

Variable	Category	Mean improvement (Post–Pre)	ANOVA F	p-value
Gender	Female	11.143	0.401	.531
	Male	8.879		
Age group - years	20–29	10.590	0.191	.827
	30–39	11.488		
	40–49	13.492		
Education level	Bachelor's degree	10.884	—	—
Employment status	Employed	10.702	0.021	.885
	Trainee	11.038		
Years of experience	1–3 years	10.697	0.025	.874
	Does not apply (trainee)	11.062		
Area of work	Critical care unit (e.g., ICU/CCU)	16.071	0.503	.683
	In-patient (Medical/Surgical)	9.755		
	Outpatient	11.409		
	Does not apply (trainee)	10.948		
Orientation received	Yes	9.654	2.398	.107
	No	20.188		
	Does not apply (trainee)	10.948		
Refresher training (last 12 months)	Yes	12.191	0.365	.697
	No	9.458		
	Does not apply (trainee)	10.948		
Read job description (last 12 months)	Yes	11.207	0.270	.607
	No	9.797		

Discussion

The educational intervention led to a significant increase in overall knowledge, with the total composite score rising by +10.88 percentage points ($p < .001$). The most substantial improvement occurred in the objective knowledge domain, which rose from a low baseline of 41.43% to 61.22%, underscoring critical gaps in understanding of scope, safety, and professional conduct. Core clinical tasks, safety, and communication also improved significantly. In contrast, role clarity showed only a modest, non-significant gain, rising from 62.76% to 66.74%, the lowest among baseline domains. No significant differences in improvement were observed across demographic groups. These findings reflect both the effectiveness of the intervention in closing key knowledge gaps and the persistent challenge of improving conceptual clarity around role boundaries.

Similar studies using pre-post-intervention designs on HCAs show clear increases in composite knowledge and performance scores after brief training programs. Many training evaluations administer comprehensive tests or competency assessments covering multiple skill areas, and results indicate significant overall improvement. For example, a trial in nursing homes found that HCAs who received a structured education program had higher overall care knowledge scores and self-rated competence post-intervention compared to controls (Cheong & Hsu, 2021). In one study with targeted patient safety workshops, HCAs reported greater confidence in handling untoward incidents and a post-training drop in adverse events on the ward, indicating better patient safety outcomes (Kantaris et al., 2020). A pre/post study found that HCAs significantly improved their recognition of Nursing home-acquired pneumonia and Urinary tract infection symptoms following targeted infection training, with gains maintained at follow-up (Quail et al., 2015). Another intervention showed that nursing home aides improved communication knowledge after dementia-focused training, with clear gains from baseline to post-training (Williams et al., 2016). This suggests that even relatively short, targeted programs can elevate the combined knowledge base of assistants across various care topics and improve their practical performance.

Furthermore, similar to our study, such training benefits appear consistent across staff demographics (e.g., gender, age, and years of experience). In other words, short educational interventions tend to be equally effective regardless of assistants' background factors. For example, a recent study on standardized training for HCAs found no statistically significant differences in training effectiveness scores based on participants' gender or age groups and several other personal demographics, implying that older vs. younger or male vs. female assistants benefited similarly from the program (Wu et al., 2025).

While the training significantly improved overall knowledge and task performance, the modest gain in role clarity suggests that short interventions alone are insufficient to resolve entrenched issues related to professional identity, accountability, and delegation. Role ambiguity among PCTs stems not only from knowledge gaps but also from systemic factors such as inconsistent supervision, vague expectations, and hierarchical dynamics within clinical teams. Assistants frequently operate in informal zones of delegation where tasks are assigned without explicit agreement, leading to overlap, missed care, and friction (Crevacore et al., 2023; Saiki et al., 2021). Moreover, mismatched expectations between assistants and nurses, where HCAs seek broader involvement than nurses anticipate, can undermine communication and reduce team cohesion. As Carroll et al. (2024) note, role boundaries are often shaped by ward culture and interpersonal negotiation more than by policy. These realities point to the need for structured role-definition frameworks integrated into routine practice, reinforced by ongoing coaching, interprofessional dialogue, and leadership support. A one-day educational program may spark awareness, but sustained change requires systems that cultivate shared clarity and mutual trust between HCAs and supervising staff.

Limitations

While the study demonstrated significant short-term improvements, its single-group pre-post design without a control group limits causal interpretation. The short duration also precluded assessment of long-term knowledge retention or translation into clinical behavior. Additionally, the use of self-reported knowledge measures may not fully capture actual competency. The inclusion of participants from a single health cluster limits generalizability, and the scarcity of regional data on PCTs/HCAs further constrains comparative analysis. Future research should incorporate longitudinal follow-up, objective performance metrics, and context-tailored, multi-session training models embedded in team-based practice.

Conclusion

This study is the first in Saudi Arabia to assess the effectiveness of a structured educational program specifically tailored for PCTs. The intervention resulted in significant improvements in

overall knowledge, particularly in clinical tasks, safety, and professional conduct, while more modest gains were observed in role clarity. Baseline data revealed critical gaps in PCTs' understanding of scope and responsibilities, underscoring the need for continued, targeted training. Given the scarcity of regional research on this workforce, these findings provide foundational evidence to support ongoing investment in structured education for PCTs, but also highlight that role clarity may require more than brief training; systemic reinforcement and interprofessional alignment will be necessary to ensure lasting clarity in responsibilities.

Author Contributions: Conceptualization, N.M.A. and A.M.A.; Methodology, N.M.A.; Validation, N.M.A., A.M.A., and W.D.A.; Formal Analysis, A.M.A.; Investigation, W.D.A., K.A.G., M.K.A., and E.H.A.; Resources, K.A.G. and W.D.A.; Data Curation, K.A.G. and M.K.A.; Educational Program Development and Implementation, N.M.A., W.D.A., K.A.G., M.K.A., E.H.A., O.A.A., F.N.A., A.E.A. and L.A.A.; Original Draft Preparation, A.M.A. and W.D.A.; Review & Editing, N.M.A., M.N.A., O.A.A., F.N.A., L.A.A. and A.E.A.; Visualization, A.M.A.; Supervision, N.M.A. and M.N.A.; Project Administration, N.M.A. and W.D.A.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Hail Health Health Cluster Institutional Review Board (approval number (2025-106) on date of approval).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data supporting the findings of this study are available from the corresponding author upon reasonable request. Due to institutional policies and participant confidentiality agreements, the dataset is not publicly available.

Conflicts of Interest: The authors declare no conflicts of interest related to this study.

References

- Blay, N., & Roche, M. A. (2020). A systematic review of activities undertaken by the unregulated Nursing Assistant 非规范化助理护士活动的系统综述. *Journal of Advanced Nursing*, 76(7), 1538–1551. <https://doi.org/10.1111/JAN.14354>
- Buljac-Samardzic, M., Doekhie, K. D., & Van Wijngaarden, J. D. H. (2020). Interventions to improve team effectiveness within health care: A systematic review of the past decade. *Human Resources for Health*, 18(1), 1–42. <https://doi.org/10.1186/S12960-019-0411-3/TABLES/2>
- Campbell, A. R., Kennerly, S., Swanson, M., Forbes, T., Anderson, T., & Scott, E. S. (2021). Relational Quality between the RN and Nursing Assistant: Essential for Teamwork and Communication. *Journal of Nursing Administration*, 51(9), 461–467. <https://doi.org/10.1097/NNA.0000000000001046>
- Carroll, R. E., De Vries, K., Goodman, C., & Brown, J. (2024). Health care assistant and registered nurse dyads, working together and apart – a qualitative study. *BMC Nursing*, 23(1), 1–10. <https://doi.org/10.1186/S12912-024-02619-Z/PEER-REVIEW>
- Cheong, P. L., & Hsu, N. (2021). Developing and Evaluating a Continuous Education Program for Healthcare Assistants in Macao: A Cluster-Randomized Trial. *International Journal of Environmental Research and Public Health* 2021, Vol. 18, Page 4990, 18(9), 4990. <https://doi.org/10.3390/IJERPH18094990>
- Crevacore, C., Jacob, E., Coventry, L. L., & Duffield, C. (2023). Integrative review: Factors impacting effective delegation practices by registered nurses to assistants in nursing. *Journal of Advanced Nursing*, 79(3), 885–895. <https://doi.org/10.1111/JAN.15430>
- Duffield, C., Twigg, D., Roche, M., Williams, A., & Wise, S. (2019). Uncovering the Disconnect Between Nursing Workforce Policy Intentions, Implementation, and Outcomes: Lessons Learned From the Addition of a Nursing Assistant Role. *Policy, Politics & Nursing Practice*, 20(4), 228–238. <https://doi.org/10.1177/1527154419877571>

- Griffiths, P., Saville, C., Ball, J., Dall'Ora, C., Meredith, P., Turner, L., & Jones, J. (2023). Costs and cost-effectiveness of improved nurse staffing levels and skill mix in acute hospitals: A systematic review. *International Journal of Nursing Studies*, *147*, 104601. <https://doi.org/10.1016/J.IJNURSTU.2023.104601>
- Huang, S., Yau, S. Y., Lee, Y. K. L., Song, J., Guo, Y., & Dong, D. (2025). Job characteristics, personal characteristics and well-being of nursing assistants in long-term care facilities: A mixed methods systematic review and narrative synthesis. *International Journal of Nursing Studies*, *161*, 104934. <https://doi.org/10.1016/J.IJNURSTU.2024.104934>
- Jackson, J., Gadimova, F., & Epko, S. (2024). A nurse by any other name? An international comparison of nomenclature and regulation of healthcare assistants. *International Journal of Nursing Studies Advances*, *6*, 100200. <https://doi.org/10.1016/J.IJNSA.2024.100200>
- Kagonya, V. A., Onyango, O. O., Maina, M., Gathara, D., English, M., & Imam, A. (2023). Characterising support and care assistants in formal hospital settings: a scoping review. *Human Resources for Health*, *21*(1), 1–14. <https://doi.org/10.1186/S12960-023-00877-7/TABLES/4>
- Kantaris, X., Radcliffe, M., Acott, K., Hughes, P., & Chambers, M. (2020). Training healthcare assistants working in adult acute inpatient wards in Psychological First Aid: An implementation and evaluation study. *Journal of Psychiatric and Mental Health Nursing*, *27*(6), 742–751. <https://doi.org/10.1111/JPM.12633>
- Kilpatrick, K., Paquette, L., Jabbour, M., Tchouaket, E., Fernandez, N., Al Hakim, G., Landry, V., Gauthier, N., Beaulieu, M. D., & Dubois, C. A. (2020). Systematic review of the characteristics of brief team interventions to clarify roles and improve functioning in healthcare teams. *PLoS ONE*, *15*(6), e0234416. <https://doi.org/10.1371/JOURNAL.PONE.0234416>
- Martin, P., Lizarondo, L., Kumar, S., & Snowdon, D. (2021). Impact of clinical supervision on healthcare organisational outcomes: A mixed methods systematic review. *PLoS ONE*, *16*(11), e0260156. <https://doi.org/10.1371/JOURNAL.PONE.0260156>
- Munn, Z., Tufanaru, C., Aromataris, E., Mccbride, L.-J., Molineux, M., & Pearson, A. (2011). *Clinical Education and Training for Health Assistants: A systematic review to support an external evaluation of clinical education and training for allied health assistants Report to Queensland Health*.
- Norful, A. A., Brewer, K. C., Cahir, K. M., & Dierkes, A. M. (2024). Individual and organizational factors influencing well-being and burnout amongst healthcare assistants: A systematic review. *International Journal of Nursing Studies Advances*, *6*, 100187. <https://doi.org/10.1016/J.IJNSA.2024.100187>
- Quail, P., Shaw, M., Ahmed, S., Parry, S., Hofmeister, M., & Drummond, N. (2015). Effectiveness of a Health Care Aide Educational Intervention to Improve Recognition of Urinary Tract Infection and Nursing Home Acquired Pneumonia Symptoms in Long-Term Care Facilities: A Pre-Post Intervention Trial. *The Journal of Nursing Home Research*. <https://www.jnursinghomeresearch.com/498-effectiveness-of-a-health-care-aide-educational-intervention-to-improve-recognition-of-urinary-tract-infection-and-nursing-home-acquired-pneumonia-symptoms-in-long-term-care-facilities-a-pre-post-i.html>
- Saiki, M., Kunie, K., Takemura, Y., Takehara, K., & Ichikawa, N. (2020). Relationship between nurses' perceptions of nursing assistant roles and information-sharing behaviors: A cross-sectional study. *Nursing & Health Sciences*, *22*(3), 706–713. <https://doi.org/10.1111/NHS.12717>
- Saiki, M., Takemura, Y., & Kunie, K. (2021). Nursing assistants' desired roles, perceptions of nurses' expectations and effect on team participation: A cross-sectional study. *Journal of Nursing Management*, *29*(5), 1046–1053. <https://doi.org/10.1111/JONM.13242>
- SCFHS. (2022). *PATIENT CARE TECHNICIAN (PCT)*. www.scfhs.org.sa
- U.S. Bureau of Labor Statistics. (2024). *Nursing Assistants Week recognizes the third-largest healthcare occupation : The Economics Daily: U.S. Bureau of Labor Statistics*. https://www.bls.gov/opub/med/2025/nursing-assistants-week-recognizes-the-third-largest-healthcare-occupation.htm?utm_source=chatgpt.com
- Van Kuppenveld, M., Lovink, M. H., & Persoon, A. (2023). Experiences and needs of certified nursing assistants regarding coaching by bachelor-educated registered nurses in nursing homes: A qualitative study. *Nursing Open*, *10*(6), 4044–4054. <https://doi.org/10.1002/NOP2.1664>
- Walker, F. A., Ball, M., Cleary, S., & Pisani, H. (2021). Transparent teamwork: The practice of supervision and delegation within the multi-tiered nursing team. *Nursing Inquiry*, *28*(4), e12413. <https://doi.org/10.1111/NIN.12413>

- Williams, K. N., Perkhounkova, Y., Bossen, A., & Hein, M. (2016). Nursing Home Staff Intentions for Learned Communication Skills: Knowledge to Practice. *Journal of Gerontological Nursing*, 42(3), 26–34. <https://doi.org/10.3928/00989134-20160212-06>
- Wu, M., Yang, Y., Lin, Y., Chen, M., & Chen, Y. (2025). Effectiveness and influencing factors of standardised training for nursing assistants: a cross-sectional study. *BMJ Open*, 15(2), e088644. <https://doi.org/10.1136/BMJOPEN-2024-088644>

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.