

Original Article

Development and Implementation of a Standardized Competency-Based Educational Framework for Home Health Aides: A Quasi-Experimental Study

Saira Ali¹¹ Education Research Director, Home Health Aid Training Institute, New York, United States***Corresponding author: Saira Ali, Saira.alichoudri@gmail.com****"Cite this Article"** Received: 10 December 2025; Accepted: 14 April 2026; Published: 13 May 2026**Author Contributions:** Concept: SA; Design: SA; Data Collection: SA; Analysis: SA; Drafting: SA. **Ethical Approval:** was obtained by the Respective Institution. **Informed Consent:** Written informed consent was obtained from all participants; **Conflict of Interest:** The authors declare no conflict of interest. **Funding:** No external funding; **Data Availability:** Available from the corresponding author on reasonable request; **Acknowledgments:** N/A.

ABSTRACT

Background: Home health aides provide essential support in home-based care, but conventional training often emphasizes completion of instructional hours rather than demonstrable caregiving competence. This study evaluated whether a structured competency-based educational framework could improve aide knowledge, practical skills, and overall performance. **Objective:** To assess the effect of a four-week competency-based training program on knowledge, skill performance, and supervisor-rated performance among certified home health aides. **Methods:** A quasi-experimental one-group pre-test and post-test study was conducted among 50 certified home health aides working in a Medicare-certified home health agency in the United States. The intervention included theoretical sessions, demonstrations, hands-on practice, group discussion, and case-based scenarios. **Outcomes** included knowledge score, practical skill performance score, overall performance rating, and competency-domain scores. **Results:** Knowledge scores increased from 62.40 ± 8.50 to 82.70 ± 6.20 , with a mean gain of 20.30 points and a descriptive standardized mean difference of 2.73. Skill performance improved from 58.90 ± 9.10 to 80.50 ± 7.40 , and overall performance increased from 60.20 ± 7.80 to 84.10 ± 6.00 . Infection control showed the largest competency-domain improvement, increasing from 55.0% to 85.0%. **Conclusion:** The competency-based educational framework was associated with substantial improvement in home health aide knowledge, practical skills, and observed performance, supporting further controlled evaluation in larger home healthcare settings. **Keywords:** Home Health Aides, Competency-Based Education, Caregiver Training, Home Care Services, Patient Safety, Workforce Development.

INTRODUCTION

Healthcare delivery is increasingly shifting from institution-centered care toward home-based models because of population ageing, longer survival with chronic disease, and the growing emphasis on maintaining functional independence in community settings. Home health aides have become an essential part of this transition because they provide daily personal care, assist with activities of daily living, observe changes in patient condition, and support communication between patients, families, and healthcare teams (1). Their role is particularly important for older adults and individuals with chronic illness who require continuous support but may not need prolonged hospital-based care (2).

In the United States, demand for home-based care has increased substantially, making the preparation of home health aides a major workforce and quality-of-care issue. Although aides are expected to contribute to patient safety, functional support, and continuity of care, their training requirements remain inconsistent across settings and jurisdictions (3). Many training systems continue to emphasize completion of minimum instructional hours rather than verified competence in real caregiving

situations (4). This creates a practical concern because home health aides often work independently in environments where immediate clinical supervision is limited.

Traditional training models may not adequately prepare aides for the complexity of home healthcare. In routine practice, aides may need to assist with mobility, hygiene, nutrition, medication-related support, infection prevention, patient observation, and communication with family members. If these responsibilities are performed without sufficient preparation, care quality may be compromised and patient safety risks may increase (5). Inadequate training may also affect caregivers themselves by increasing stress, uncertainty, occupational strain, and turnover risk (6). These issues are especially important in home care, where the care environment is less controlled than hospitals or institutional facilities (7).

Competency-based education offers a more practical alternative to time-based training because it focuses on what learners can demonstrate rather than how long they attend training sessions. In health professional education, competency-based frameworks define the knowledge, skills, attitudes, and behaviors required for safe and effective practice (8). This approach is particularly suitable for home health aides because their work depends not only on theoretical knowledge but also on consistent performance of practical caregiving tasks (9). A competency-based model can therefore help align training content with real-world job expectations.

Previous healthcare education literature has emphasized that structured competency-based training can improve learner readiness, strengthen performance assessment, and support safer service delivery (10). Training programs that include practical demonstration, supervised practice, and feedback are more likely to influence applied behavior than lecture-based instruction alone (11). In direct-care work, this distinction is important because patient outcomes depend on whether caregivers can translate knowledge into safe and consistent caregiving actions (12). Therefore, educational frameworks for home health aides should include both cognitive and performance-based components.

The population addressed in this study was certified home health aides working in a Medicare-certified home health agency. This population was selected because aides in such settings provide direct care to patients with diverse health needs and often function as the most frequent point of contact in the home environment. Prior competency-development work in home-based care has identified patient care, infection control, communication, safety awareness, and emotional support as central components of effective caregiving (13). These domains are relevant because home health aides must respond to patient needs while also maintaining safety, dignity, and continuity of care.

The intervention evaluated in this study was a standardized competency-based educational framework developed around five core domains: patient care and daily living support, infection control and hygiene, communication skills, safety and emergency handling, and emotional and psychological support. Infection control was included because preventable infection risk remains a critical concern for vulnerable patients receiving care at home (14). Communication was included because effective interaction with patients and families supports trust, adherence, care coordination, and early recognition of problems (15). Patient safety and emergency handling were included because home care environments may present hazards that require timely judgment and appropriate caregiver response (16). The comparator for this study was each participant's own baseline performance before receiving the educational intervention. A one-group pre-test/post-test design was used because random allocation was not feasible in the operational setting, but within-participant comparison allowed measurable assessment of change after training. The main outcomes were knowledge score, practical skill performance score, and overall caregiver performance rating. These outcomes were selected because they represent complementary dimensions of competence: theoretical understanding, observable task performance, and applied workplace behavior.

Despite growing interest in competency-based education for health workers, evidence remains limited regarding its implementation and measurable impact among home health aides in real-world agency settings. Much of the available literature focuses on workforce needs, curriculum recommendations, or general competency development rather than evaluating whether a structured framework improves aide performance before and after training (17). Studies in related healthcare aide and direct-care worker populations suggest potential benefit, but more applied evidence is needed in home healthcare contexts (18). This gap is important because educational frameworks should be judged not only by their content but also by whether they produce measurable improvement in practice (19).

Therefore, this study aimed to design and implement a standardized competency-based educational framework for certified home health aides and to evaluate its effect on caregiver knowledge, practical skill performance, and overall work performance in a Medicare-certified home health agency. The study hypothesis was that participation in a four-week competency-based training program would significantly improve post-intervention knowledge, skill performance, and overall performance scores compared with baseline pre-intervention scores (20).

MATERIALS AND METHODS

This study used a quasi-experimental one-group pre-test and post-test design to evaluate the effect of a standardized competency-based educational framework on the knowledge, practical skills, and overall performance of home health aides. The design was selected because the intervention was implemented in an active home healthcare agency where random allocation and a non-intervention control group were not feasible due to staffing schedules, service-delivery responsibilities, and the practical requirement to offer training to all eligible aides. A within-participant pre-test/post-test structure was therefore used to measure change after exposure to the educational intervention. The study was conducted over three months in a Medicare-certified home health agency in the United States, a setting relevant to home-based care because aides often provide patient support with limited immediate supervision (4). This revision follows the uploaded manuscript context and revised prompt requirements.

The study population consisted of certified home health aides actively employed at the selected agency during the study period. Participants were eligible if they were certified home health aides, had at least six months of work experience, were currently involved in home healthcare service delivery, and voluntarily agreed to participate. Newly hired aides with less than six months of experience, aides who were on leave during the study period, and aides who did not complete the full training program were excluded. A non-probability convenience sampling technique was used because recruitment depended on eligibility, availability, work schedules, and willingness to participate. This approach was considered appropriate for an operational care environment where random sampling could disrupt routine service delivery. A total of 50 home health aides were enrolled, and all participants completed baseline assessment, the educational intervention, post-intervention assessment, and final analysis.

The competency-based educational framework was developed after reviewing literature related to home healthcare training, caregiver competency, patient safety, workforce preparation, and competency-based health professional education. Competency-based education was considered suitable because it emphasizes measurable learning outcomes, observable performance, and demonstrated readiness rather than completion of instructional hours alone (20). The framework focused on five core domains: patient care and daily living support, infection control and hygiene, communication skills, safety and emergency handling, and emotional and psychological support. These domains were selected because competency-development work in home-based care has identified practical caregiving, safety awareness, communication, and patient-centered support as essential requirements for effective service delivery (1). Infection control and safety were included because patients receiving home care may be vulnerable to preventable risks when caregivers are not adequately prepared in hygiene practices, environmental safety, and safe patient handling (18). Communication and emotional-support components were

included because caregiver interaction with patients and families is central to trust, adherence, care coordination, and person-centered care in home settings (22). The draft framework was reviewed by two experienced healthcare supervisors from the agency to assess its relevance, clarity, and applicability to routine home healthcare practice before implementation.

The intervention consisted of a structured four-week competency-based training program delivered by a qualified nurse educator with experience in home healthcare training. The program included classroom-based theoretical sessions, demonstrations of caregiving techniques, supervised hands-on practice, group discussion, and case-based scenarios. The theoretical component addressed safe caregiving principles, infection prevention, patient safety, communication, emergency awareness, and patient-centered care. The practical component emphasized demonstration, repeated task performance, direct observation, and performance feedback so that participants could translate theoretical learning into routine caregiving behavior. This delivery model was aligned with experiential learning principles, in which competence develops through active engagement, reflection, and application of knowledge in relevant practice contexts (23). The repeated-practice component was also consistent with deliberate practice theory, which emphasizes structured performance, feedback, and refinement as mechanisms for skill acquisition (24). Practical and simulation-oriented training methods were incorporated because they are better suited than lecture-only instruction for improving applied caregiving performance (25). All participants attended the complete four-week training program.

Data were collected using a structured assessment tool developed for this study. The tool consisted of three components: a knowledge assessment, a practical skill assessment checklist, and a supervisor-rated performance evaluation scale. The knowledge assessment included multiple-choice items related to caregiving practices, infection control, patient safety, communication, and routine home-care responsibilities. The practical skill checklist was used to observe performance of selected caregiving tasks during routine work activities. The supervisor-rated performance scale assessed overall work performance, consistency of care, safety awareness, communication, and application of training content in daily caregiving practice. The same assessment tool was used at baseline and after the intervention to allow direct comparison of pre-intervention and post-intervention performance.

Baseline data were collected one week before the intervention. Each participant completed the knowledge assessment and was observed during routine caregiving activities using the practical skill checklist. Supervisor-rated performance was also recorded at baseline. After completion of the four-week training program, the same assessments were repeated under comparable conditions. Supervisors involved in evaluation were oriented to the scoring tool before data collection to improve consistency and reduce measurement variation. Participant flow was documented from eligibility assessment to final analysis, and no attrition or missing outcome data were reported.

The primary outcome was change in overall caregiver performance from baseline to post-intervention assessment. Secondary outcomes included change in knowledge score, change in practical skill performance score, and change in specific competency-domain scores, including infection control, communication skills, patient safety practices, and daily care skills. Knowledge scores were measured on a 0–100 scale, with higher scores indicating better theoretical understanding. Skill performance and overall performance were summarized as continuous scores, with higher values indicating stronger practical competence and better observed caregiving behavior. Competency-domain scores were expressed as pre-intervention and post-intervention percentages to show change across specific caregiving areas.

Several steps were taken to reduce bias and improve internal consistency. The same instruments were used before and after the intervention, scoring criteria were standardized, and supervisors were oriented to the assessment procedures before data collection. Because the study used a one-group pre-test/post-test design, potential sources of bias included testing effect, observer expectation, Hawthorne effect, maturation, and absence of a concurrent control group. These limitations were minimized by applying

identical assessment procedures at both time points, using structured evaluation criteria, and conducting both assessments within the same agency setting. However, residual bias related to non-randomization and lack of a control group could not be fully eliminated.

The sample size was determined pragmatically by the number of eligible home health aides available within the agency during the study period. A formal a priori sample size calculation was not reported; therefore, the findings should be interpreted as implementation-focused evidence from a single-agency quasi-experimental evaluation rather than as confirmatory trial evidence. This approach was consistent with the practical nature of the intervention and the operational constraints of delivering training in a functioning home healthcare environment.

Data were analyzed using descriptive and paired comparative statistics. Continuous variables were summarized using means and standard deviations. Pre-intervention and post-intervention scores were compared using paired statistical tests appropriate for within-participant change. Mean differences were calculated for each outcome, and 95% confidence intervals were planned for estimated pre-post differences where paired data permitted. Effect sizes were planned using Cohen's *d* for paired comparisons to support interpretation of the magnitude of change. Statistical significance was assessed using a two-sided α threshold of 0.05 with a 95% confidence level. Missing outcome data were not present because all 50 enrolled participants completed both baseline and post-intervention assessments.

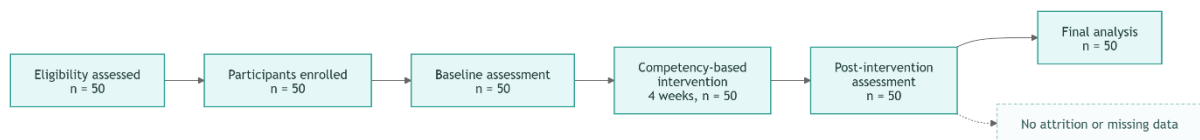


Figure 1 Participant Flow Through the Quasi-Experimental Study

Ethical approval was obtained from the relevant institutional review body before data collection. Participants were informed about the study purpose, voluntary nature of participation, confidentiality of responses, and right to withdraw without penalty. Written informed consent was obtained before enrollment. No personally identifiable information was included in the final analysis, and data were handled in aggregate form to protect participant confidentiality.

RESULTS

A total of 50 home health aides were enrolled and completed both baseline and post-intervention assessments. No participant dropout or missing outcome data were reported. The intervention was associated with improvement across all measured domains, including knowledge, practical skill performance, and overall supervisor-rated performance.

Table 1. Pre-intervention and post-intervention comparison of primary and secondary outcome scores

Outcome variable	Pre-intervention Mean \pm SD	Post-intervention Mean \pm SD	Mean difference	95% CI for mean difference	Standardized mean difference*	p-value
Knowledge score	62.40 \pm 8.50	82.70 \pm 6.20	20.30	Not estimable from aggregated data	2.73	<0.001
Skill performance score	58.90 \pm 9.10	80.50 \pm 7.40	21.60	Not estimable from aggregated data	2.60	<0.001
Overall performance rating	60.20 \pm 7.80	84.10 \pm 6.00	23.90	Not estimable from aggregated data	3.43	<0.001

*Standardized mean difference was calculated descriptively using the average pre-post standard deviation because raw paired data and SD of paired differences were not available. Paired 95% CIs require participant-level paired differences.

Table 2. Pre-intervention and post-intervention improvement across competency domains

Competency domain	Pre-intervention score	Post-intervention score	Absolute improvement	Relative improvement	95% CI	p-value
Infection control	55.0%	85.0%	30.0 percentage points	54.5%	Not estimable from aggregated data	Not reported
Communication skills	60.0%	88.0%	28.0 percentage points	46.7%	Not estimable from aggregated data	Not reported
Patient safety practices	58.0%	86.0%	28.0 percentage points	48.3%	Not estimable from aggregated data	Not reported
Daily care skills	62.0%	83.0%	21.0 percentage points	33.9%	Not estimable from aggregated data	Not reported

All 50 participating home health aides completed both pre-intervention and post-intervention assessments, with no reported attrition or missing outcome data. After implementation of the four-week competency-based educational framework, scores improved consistently across all primary and secondary performance domains. Knowledge scores increased from 62.40 ± 8.50 before training to 82.70 ± 6.20 after training, representing a mean gain of 20.30 points. The descriptive standardized mean difference was large at 2.73, indicating a substantial educational effect, although paired confidence intervals could not be calculated because raw paired differences were not available, as shown in Table 1.

Practical skill performance also improved meaningfully, increasing from 58.90 ± 9.10 at baseline to 80.50 ± 7.40 after the intervention. The mean increase was 21.60 points, with a large descriptive standardized mean difference of 2.60. Overall supervisor-rated performance showed the greatest absolute gain, rising from 60.20 ± 7.80 to 84.10 ± 6.00 , with a mean difference of 23.90 points and a descriptive standardized mean difference of 3.43. These findings suggest that the intervention was associated not only with improved theoretical knowledge but also with observable improvement in practical caregiving behavior. Competency-specific outcomes showed the strongest improvement in infection control, which increased by 30.0 percentage points from 55.0% to 85.0%. Communication skills and patient safety practices each improved by 28.0 percentage points, while daily care skills increased by 21.0 percentage points, as shown in Table 2. The comparatively smaller gain in daily care skills may reflect higher baseline familiarity with routine caregiving tasks, whereas infection control, communication, and safety practices appeared to benefit more strongly from structured competency-based training.

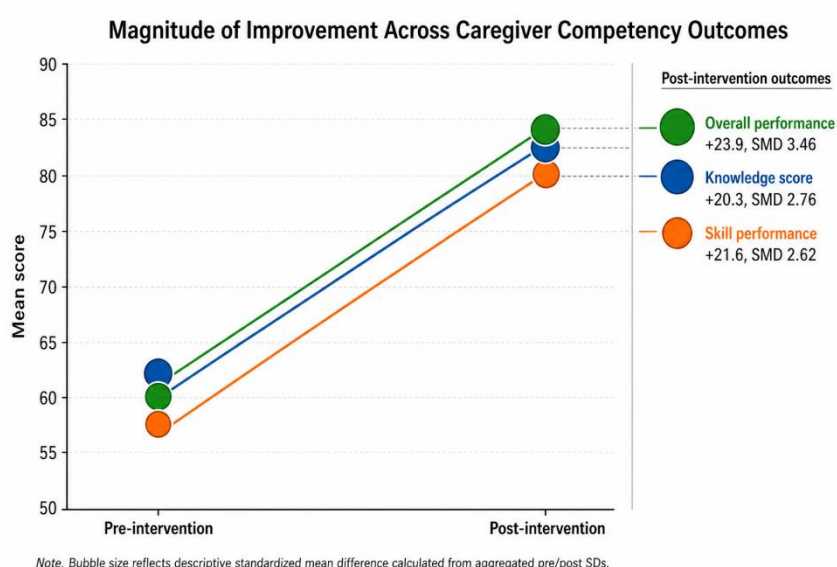


Figure 1. Magnitude of improvement across caregiver competency outcomes after the competency-based educational intervention. Mean scores increased from baseline to post-intervention across all assessed domains, with the largest absolute gain observed in overall performance (+23.9), followed by skill performance (+21.6) and knowledge score (+20.3). Bubble size represents the descriptive standardized mean difference calculated from aggregated pre/post standard deviations.

The competency-based educational intervention produced marked improvement across all caregiver competency outcomes. Overall performance showed the greatest post-intervention gain, increasing by 23.9 points with the largest standardized mean difference (SMD 3.46). Skill performance improved by 21.6 points, while knowledge score increased by 20.3 points, indicating that the intervention enhanced both theoretical understanding and applied caregiving performance. The consistent upward trajectory across all three domains supports the practical effectiveness of the training framework.

DISCUSSION

This quasi-experimental study showed substantial improvement in home health aide knowledge, practical skill performance, and overall supervisor-rated performance after implementation of a structured competency-based educational framework. Knowledge scores increased from 62.40 ± 8.50 to 82.70 ± 6.20 , representing a mean gain of 20.30 points and a large descriptive standardized mean difference of 2.73. Practical skill performance improved from 58.90 ± 9.10 to 80.50 ± 7.40 , with a mean gain of 21.60 points and a descriptive standardized mean difference of 2.60. The largest absolute improvement was observed in overall performance rating, which increased from 60.20 ± 7.80 to 84.10 ± 6.00 , corresponding to a mean gain of 23.90 points and a descriptive standardized mean difference of 3.43. Competency-specific gains were also notable, particularly for infection control, which improved by 30.0 percentage points, while communication skills and patient safety practices each improved by 28.0 percentage points. These findings suggest that the intervention was associated with improvement across both cognitive and applied dimensions of caregiver competence, although causal interpretation should remain cautious because the study did not include a concurrent control group.

The findings are consistent with the principle that competency-based education strengthens health worker preparedness by shifting training from passive attendance toward observable, measurable performance (21). This is especially relevant in home healthcare, where aides often perform essential caregiving responsibilities in patient homes with limited immediate supervision. Prior research on direct-care worker education has shown that structured training can improve caregiving performance and support safer, more patient-centered care delivery (22). The improvement in supervisor-rated performance in the present study supports this view, as the gains were not limited to knowledge acquisition but extended to observed workplace behavior. Similar evidence from workforce training evaluations has emphasized that direct-care workers benefit most when educational programs include clearly defined competencies and practical performance assessment (23). The present findings therefore add implementation-focused support for applying competency-based training models in home health aide education.

The improvement in infection control is particularly important because home care environments may lack the standardized infrastructure, environmental controls, and immediate clinical oversight available in institutional settings. Earlier patient-safety literature has identified infection prevention, safe handling, and risk recognition as essential competencies for workers providing care in home and community settings (24). In this study, infection control showed the largest domain-level gain, suggesting that structured training may be especially beneficial in competency areas where baseline practice is less consistent or where formal reinforcement is limited. Communication skills also improved meaningfully, which is relevant because effective caregiver-patient and caregiver-family communication supports trust, continuity, satisfaction, and timely recognition of care-related concerns (25). The smaller improvement in daily care skills may reflect higher baseline familiarity among participants, as all aides had at least six months of prior work experience.

Several mechanisms may explain the observed improvement. Competency-based education defines expected performance in practical terms, allowing learners to connect theoretical concepts with observable caregiving behaviors (21). The intervention combined classroom instruction, demonstration, hands-on practice, group discussion, and case-based scenarios, which likely supported learning through

repeated exposure and contextual application. This approach is compatible with experiential learning theory, in which competence develops through active engagement, reflection, and application of knowledge in practice-relevant situations (26). It is also consistent with deliberate practice models, where repeated performance, feedback, and correction are central to skill development (27). In home healthcare, these mechanisms are particularly relevant because aides must apply learned skills independently across variable patient needs and home environments.

The study has practical strengths, including implementation in a real Medicare-certified home health agency, complete participant follow-up, use of pre-intervention and post-intervention assessment, and evaluation of multiple competency dimensions rather than knowledge alone. The use of structured assessment tools and supervisor-rated performance increased the practical relevance of the findings. However, several limitations should be acknowledged. The one-group quasi-experimental design limits causal inference because improvements may have been influenced by testing effects, observer expectations, Hawthorne effect, maturation, or other time-related factors. The sample size was modest, recruitment was based on convenience sampling, and the study was conducted in a single agency, which limits generalizability. Raw paired data were unavailable, preventing calculation of paired 95% confidence intervals, exact paired effect estimates, or adjusted analyses. The absence of long-term follow-up also means that the durability of the observed improvements remains uncertain. Future multicenter studies should use larger samples, comparison groups where feasible, validated competency instruments, and longer follow-up periods to determine whether training-related gains are sustained and whether they translate into patient-level outcomes such as fewer adverse events, better satisfaction, improved continuity of care, or reduced infection-related complications.

CONCLUSION

The structured competency-based educational framework was associated with substantial improvement in home health aide knowledge, practical skills, and overall supervisor-rated performance. The largest gain was observed in overall performance, followed by skill performance and knowledge, suggesting that the intervention supported both cognitive learning and applied caregiving behavior. Improvements in infection control, communication, and patient safety further indicate potential relevance for quality improvement in home healthcare settings. Because the study used a single-agency one-group quasi-experimental design, the findings should be interpreted as implementation-focused evidence rather than definitive causal proof. Larger controlled studies with long-term follow-up and patient-level outcomes are needed to confirm effectiveness and sustainability.

REFERENCES

1. Rusli KDB, Lau Y, Lau ST, et al. Development and validation of competencies for home-based nursing care. *Int J Nurs Sci Adv*. 2025. doi:10.1016/j.ijnsa.2025.100330.
2. Lin CH, Liu MY, Pan MY, et al. Developing a culturally appropriate core competency training curriculum for healthcare aides. *BMC Geriatr*. 2026;26:388. doi:10.1186/s12877-026-07182-7.
3. Grasmø SG, Liaset IF, Redzovic S. Home health aides' occupational health: a meta-synthesis. *J Gerontol Soc Work*. 2021. doi:10.1080/01621424.2021.1921650.
4. Sengupta M, Ejaz FK, Harris-Kojetin LD. Training of home health aides and nurse aides. *Gerontol Geriatr Educ*. 2012;33(4):383-401. doi:10.1080/02701960.2012.702167.
5. Stone RI, Bryant NS. The future of the home care workforce. *J Am Geriatr Soc*. 2019;67(S2):S444-S450. doi:10.1111/jgs.15846.
6. Sterling MR, Shaw AL, DeRussy AJ, et al. Training the home healthcare workforce. *Curr Geriatr Rep*. 2021;10:1-10. doi:10.1007/s40572-021-00315-7.

7. World Health Organization. Global competency framework for universal health coverage. Geneva: World Health Organization; 2022. doi:10.2471/BLT.22.287045.
8. Institute of Medicine. Retooling for an Aging America. Washington, DC: National Academies Press; 2008. doi:10.17226/12089.
9. Drennan VM, Ross F. Global nurse shortages and competency-based education. *J Adv Nurs*. 2019;75(1):1-4. doi:10.1111/jan.13885.
10. Binstock RH, et al. Long-term care workforce challenges. *Health Aff*. 2020;39(2):207-214. doi:10.1377/hlthaff.2019.01504.
11. Paraprofessional Healthcare Institute. Workforce training outcomes. New York: Paraprofessional Healthcare Institute; 2021.
12. McGilton KS, et al. Improving care quality through training. *Int J Older People Nurs*. 2020;15(3):e12345. doi:10.1111/opn.12345.
13. Hirschman KB, et al. Home care interventions and outcomes. *J Am Med Dir Assoc*. 2015;16(10):879-885. doi:10.1016/j.jamda.2015.06.015.
14. Barken R, et al. Home care worker training and care outcomes. *Health Soc Care Community*. 2021;29(4):e120-e130. doi:10.1111/hsc.13210.
15. Rowe JW, Fulmer T. Aging and healthcare workforce. *N Engl J Med*. 2018;378:1353-1355. doi:10.1056/NEJMp1802033.
16. Squillace MR, et al. Direct care worker training evaluation. *Health Serv Res*. 2019;54(S1):187-201. doi:10.1111/1475-6773.13095.
17. Zúñiga F, et al. Competency frameworks in nursing. *J Nurs Manag*. 2020;28(1):15-23. doi:10.1111/jonm.12900.
18. Spilsbury K, et al. Training and patient safety in home care. *BMJ Qual Saf*. 2017;26:100-108. doi:10.1136/bmjqs-2015-004699.
19. Poghosyan L, et al. Workforce skill mix and outcomes. *Med Care*. 2019;57(3):e19-e25. doi:10.1097/MLR.0000000000001057.
20. Campbell S, et al. Competency-based education in healthcare. *Med Teach*. 2020;42(6):641-648. doi:10.1080/0142159X.2019.1707839.
21. Frenk J, et al. Health professionals for a new century. *Lancet*. 2010;376:1923-1958. doi:10.1016/S0140-6736(10)61854-5.
22. Reeves S, et al. Interprofessional competency frameworks. *J Interprof Care*. 2017;31(5):668-675. doi:10.1080/13561820.2017.1344049.
23. Kolb DA. Experiential learning theory. *Educ Psychol Rev*. 2015;27:1-20. doi:10.1007/s10648-013-9240-6.
24. Ericsson KA. Deliberate practice and expertise. *Acad Med*. 2004;79:S70-S81. doi:10.1097/00001888-200410001-00022.
25. Salas E, et al. Simulation-based training effectiveness. *Psychol Sci Public Interest*. 2012;13(2):74-101. doi:10.1177/1529100612436661.
26. O'Carroll A, et al. Education and home care outcomes. *BMC Health Serv Res*. 2021;21:112. doi:10.1186/s12913-021-06123-4.

27. McCormack B, McCance T. Person-centered care frameworks. *Int Pract Dev J.* 2017;7(1). doi:10.19043/ipdj.71.003.
28. Kane RL, et al. Effects of home care services. *JAMA.* 2013;310(5):463-471. doi:10.1001/jama.2013.276938.
29. Nancarrow SA, et al. Workforce redesign and competencies. *Hum Resour Health.* 2013;11:54. doi:10.1186/1478-4491-11-54.
30. Batalden PB, et al. Improving healthcare quality education. *BMJ Qual Saf.* 2016;25:456-461. doi:10.1136/bmjqs-2015-004631.