

Future improvements should focus on four directions. First, advance the standardization and refinement of geriatric-relevant NSIs by incorporating functional status, frailty, autonomy, care transitions, and patient-reported outcomes, and develop and validate these indicators with the participation of older patients and caregivers (Connolly et al., 2025). Second, strengthen methodological rigor by conducting multicenter studies, extending follow-up, and clarifying causal relationships among NSI changes, nurse-led interventions, and “hard outcomes” (adverse events, function, mortality, and quality of life) (Martin-Khan et al., 2024). Third, build integrated digital platforms that embed NSIs into electronic health records and dashboards across hospitals, home care, and residential aged care settings to support real-time monitoring, benchmarking, and feedback. Fourth, apply implementation science methods to enhance implementation fidelity, sustainability, and staff engagement in NSI-driven QI projects, thereby moving geriatric nursing from isolated initiatives toward a continuously learning system (Cowdell et al., 2025; Wells et al., 2025).

## 8 Conclusions and Future Directions

Synthesizing evidence across multiple care contexts-including acute care, long-term care, and community care-demonstrates that nursing-sensitive indicators (NSIs) provide a feasible and essential measurement foundation for nurse-led quality improvement, and serve as key tools for demonstrating nursing’s independent contribution to patient outcomes, particularly among older populations. Existing concept analyses and systematic reviews consistently confirm that indicators such as falls, pressure injuries, infections, functional decline, mortality, and patient satisfaction reflect changes in health status that are directly influenced by nursing structures (e.g., staffing levels and nursing hours) and nursing processes (e.g., risk assessment, preventive measures, health education, and care coordination), thereby constituting core “quantifiable interfaces” for nursing quality evaluation and improvement. Accordingly, in the management of adverse events among hospitalized older patients, continuous monitoring and analysis of key NSIs-such as falls, pressure injuries, unplanned device removal, and medication-related problems-enable more accurate identification of nursing-related risks, more robust evaluation of intervention effects, and the provision of traceable and benchmarkable quantitative evidence to support quality improvement.

When NSIs are incorporated into organizational governance as standardized “nursing quality-sensitive indicators,” pilot studies and regional or national benchmarking programs indicate that capacities for adverse event surveillance are enhanced; relationships between nursing workforce capacity and preventable complications become clearer; and alignment between nursing workflows and clinical guidelines is easier to monitor and correct. National registry and benchmarking studies further suggest that indicators such as falls and pressure injuries can function as critical levers for nursing quality benchmarking, enabling identification of high-risk wards and prioritization of improvement efforts. Although evidence regarding causal effects of NSIs on all outcomes remains heterogeneous and inconsistent, overall findings demonstrate that NSIs help institutions identify high-risk areas, conduct ward-level benchmarking, and prioritize interventions, thereby reducing nursing-sensitive adverse events and supporting functional preservation in older adults. Importantly, integrating structural, process, and outcome NSIs into an “indicator portfolio” facilitates a more comprehensive nursing quality evaluation framework and promotes a transition in quality management from “outcome appraisal” toward closed-loop governance characterized by “process improvement plus outcome verification”.

NSI-based quality improvement practices offer direct implications for enhancing nursing safety among hospitalized older patients. First, adverse event prevention should be shifted “upstream” by embedding dynamic risk assessment, individualized intervention, and reassessment into routine workflows, and by incorporating high-priority risk domains into bedside rounds and nursing bundles. Consensus-based indicator systems from nursing homes, long-term care, and acute hospitals have identified key geriatric nursing risks-including systematic medication review, pressure injuries, pain, dehydration, urinary tract infections, falls, functional decline, and opportunities for engagement in meaningful activities-which should constitute core target domains for harm prevention in hospitalized older patients. In practice, embedding these indicators into admission assessments, interdisciplinary care plans, and ward-level dashboards can help nurses anticipate geriatric syndrome risks and continuously monitor whether safety initiatives are effectively reducing harm.