6.3 Integrated evaluation of nursing quality and patient safety

In evaluating the effects of QI in geriatric nursing, reliance on a single NSI or adverse event rate is insufficient to capture overall improvements in nursing quality and potential trade-offs. Concept analyses and reviews consistently emphasize the integration of structural indicators (e.g., nursing hours, staffing mix, competency levels), process indicators (e.g., risk assessment, adherence to preventive measures, humanistic communication, medication safety practices), and outcome indicators (e.g., falls, pressure injuries, infections, delirium, length of stay, readmission rates, satisfaction, and quality of life) within Donabedian's structure-process-outcome framework to form a multidimensional evaluation model (Connolly et al., 2025). In studies of "high-quality" or "seamless" nursing care for older patients, combined evaluation of clinical outcomes (complications, functional status, symptom control) with patient satisfaction and quality of life provides a more comprehensive reflection of the clinical and managerial value of improvements than reliance on event rates alone (Zuo et al., 2023; Liu, 2025; Wei et al., 2025).

At the same time, evaluation frameworks should incorporate mechanistic and mediating indicators to explain why improvements or rebounds occur. Emerging evidence highlights the critical role of safety culture, humanistic care, and informatics support in nursing quality evaluation. Safety culture training has been shown to significantly enhance nurses' safety knowledge, attitudes, and practices; such intermediate outcomes are believed to contribute to long-term reductions in adverse events. Qualitative studies of humanistic geriatric nursing grounded in three-dimensional quality structure theory identify communication, individualized needs assessment, prevention in high-risk situations, and medication safety as key nursing process domains, with satisfaction and adverse event rates serving as important endpoint indicators (Yuan et al., 2025). Informatics-focused reviews further demonstrate that enhanced documentation and decision support are associated with reductions in pressure injuries and medication errors, shorter lengths of stay, and improved adherence to preventive care, supporting a testable pathway of "informatics→process control → outcome improvement" (Shi et al., 2025). Therefore, robust evaluation of QI in inpatient geriatric nursing should adopt a triangulation approach combining NSI trajectories, adverse event incidence, and functional or patient-reported outcomes (PROs), with explicit assessment of mediating mechanisms such as safety culture and guideline adherence (Shoukr et al., 2025).

7 Managing Adverse Events in Older Patients Based on Nursing-Sensitive Indicators

7.1 Significance of nursing-sensitive indicators in managing adverse events in older patients

From the perspective of nursing-sensitive indicators (NSIs), this study systematically discusses pathways for monitoring adverse events during hospitalization and for improving quality among older patients, further underscoring the central role of NSIs in geriatric safety management. NSIs capture changes in health status that are directly influenced by nursing care and are considered foundational tools for monitoring and managing adverse events in high-risk populations. Within Donabedian's structure-process-outcome framework, NSIs link nursing structures and processes (e.g., staffing levels, skill mix, and guideline adherence) with outcomes such as falls, pressure injuries, infections, delirium, length of stay, readmission, functional decline, and satisfaction-outcomes that are highly prevalent among hospitalized older adults. Therefore, compared with traditional evaluation approaches focused primarily on medical outcomes, NSIs more directly reflect how nursing behaviors and care processes influence adverse event occurrence, thereby revealing nursing's independent contribution to patient safety.

More importantly, NSIs can support a shift in adverse event management for older patients from "post-event response" to "pre-event prevention." Research in acute geriatric care shows that outcome or quality indicators centered on geriatric syndromes and functional status help identify key points requiring targeted nursing interventions, thereby preventing complications and functional loss (Martin-Khan et al., 2024). Among frail older surgical patients, indicators such as falls, pressure injuries, delirium, pneumonia, and mortality show clustered distributions, suggesting that NSIs are not merely "outcome statistics" but also "risk markers" for identifying high-risk subgroups and promoting proactive, individualized nursing models. At the system level, trend data from regional or national programs can reveal deficiencies in functional outcomes and complication-related mortality, providing evidence to support policymaking, staffing allocation, and practice priorities in services for older adults.