Supplemental Table 2. Theme Groups of Patient Safety Nursing Research

Themes of 1 step	Themes of 2 step	Themes of 3 step	Themes of 4 step	keywords
1 Patient	1-1 Patient with risk	1-1-1 Patient characters	1-1-1-1 Patient's attributes	**patient**, act, attribute, benefit, blood, cancer, caregivers, check, complexity, concept, contribution, decision, delivery, deterioration, handling, institution, interaction, long-term, material, note, patient record, practitioner, pressure, priority, rating, recognition, recovery, responsibility, room, routine, scenario, sepsis, trauma, trust, vital sign
			1-1-1-2 Patient outcomes	**mortality**, morbidity, length of stay
			1-1-1-3 Patient undergoing surgery and anesthesia	**anesthesia**, provider, surgery
			1-1-1-4 Signs of patient harm	cue, symptom
			1-1-1-5 Patient with tube	placement, tube
			1-1-1-6 Classification of patients	category, triage
		1-1-2 Patient & medication	1-1-2-1 Patient on IV therapy	**IV**, therapy, infusion, pump, device, chemotherapy, sedation, insulin
			1-1-2-2 Patient on medication	**administration**, record, medicine, antibiotics, monitoring, procedure
			1-1-2-3 Patient in community healthcare	**health**, community, wellbeing, oral, worker, profession
		1-1-3 Patient monitoring	1-1-3-1 Monitoring	**monitor**, alarm, bed
			1-1-3-2 Audit	**audit**, chart, follow up

Themes of 1 step	Themes of 2 step	Themes of 3 step	Themes of 4 step	keywords
		1-1-4 Patient's condition	1-1-4-1 Severity of disease	**disease**, severity, chronic, transport
			1-1-4-2 Perioperative patient	**postoperative**, delirium, pain, preoperative
			1-1-4-3 Core component	**core,** element, component
	1-2 Patient at risk	1-2-1 Means of nursing care		**care**, emergency, situation, reason, obstetric, miss, ethical, transfer, requirement, provision, patient centered, mechanical ventilation, maternity, legal, expert, delegation, access, OR
		1-2-2 Inpatient care		**unit**, inpatient, ward, acute, rehabilitation, psychiatric, medical-surgical, stroke, specialty, oncology, facility, acute care setting, mental health, geriatric, certification
		1-2-3 Intensive care		**ICU**, neonate, pediatric, surgical, medical, admission, cardiac, checklist, equipment
		1-2-4 home care		**birth**, home, labor, infant, discharge, criterion, child
		1-2-5 perioperative care		**setting**, acute care, perioperative, ambulatory, homecare, personnel
2 Preventable patient harm	2-1 Infection	2-1-1 Type of infection		**infection**, respiratory, complication, healthcare-associated, CLABSI, UTI, HAI, reduction, surveillance, incidence, wound, pneumonia, death, specialist
		2-1-2 Prevention of catheter-related infection		**catheter,** urinary, insertion, utilization, maintenance, site, PICCs, central venous catheters, line
	2-2 Pressure ulcer	2-2-1 Management of pressure ulcer		**assessment,** tool, screening, treatment, diagnosis, documentation, instrument, framework, measurement, planning
		2-2-2 risk identification of pressure ulcer		**risk**, skin, injury, condition, exposure
		2-2-3 Classification of pressure ulcers		**pressure ulcer**, risk assessment, scale, classification, identification, status

Themes of 1 step	Themes of 2 step	Themes of 3 step	Themes of 4 step	keywords
	2-3 Falls	2-3-1 Risk management of falls		**prevention**, ventilator-associated pneumonia, protocol, bundle, awareness, oral care, mobility
		2-3-2 Falls in nursing home		**compliance**, standard, guideline, precaution, control
	2-4 Prevention activity	2-4-1 Prevention of Incidents		**falls,** intervention, harm, fear, occurrence, restraint, adverse event, decline, evidence-based, cost, plan
		2-4-2 Compliance		**resident**, nursing home, dementia, long-term care, high-risk, elderly
3 Practice	3-1 Practice & knowledge	3-1-1 Standard of practice		**practice**, handwashing, policy, adherence, theory, health professionals, opportunity, standardization, principle, integration, alert
		3-1-2 Knowledge		**knowledge**, gap, application, competency, EBP, understanding, competence, development, curriculum, informatics
	3-2 Communication	3-2-1 Communication & teamwork		**communication,** team work, team, collaboration, interprofessional, physician, pattern, interdisciplinary, training, professional, multidisciplinary, role, pharmacist, nurse leader, leader, NP, course
		3-2-2 Strategy of communication education		**learning**, strategy, simulation, experience, web, teaching, ER, midwife
		3-2-3 Education using communication		**staff,** education, leadership, senior, lack, feedback, shortage, skill, thinking, empowerment
	3-3 Reporting	3-3-1 Factors related with reporting		**reporting,** barrier, perception, attitude, behavior, belief, nursing staff, clinician, nurse manager
		3-3-2 Student's reporting		**student,** faculty, undergraduate, educator, confidence, pharmacy
		3-3-3 Frontline of patient safety		**RN**, clinical nurse specialist, nursing assistants, frontline
4 Error	4-1 Factors related with error			**error**, near miss, frequency, adverse, event, transition, prescribing, prescription, response, problem, solution, order
	4-2 Medication error			**medication**, dose, drug, preparation, calculation, omission, adverse effect, round, accuracy
	4-3 Error management			**management**, task, workflow, interruption, information, source, resource, human, financial, conflict

Themes of 1 step	Themes of 2 step	Themes of 3 step	Themes of 4 step	keywords
5 Environment	5-1 Work environment & Job	5-1-1 Safety culture		**work**, environment, shift, relationship, organization, culture, life, quality, sleep, fatigue, staff nurse, cognitive, failure, climate, dimension, partnership, workplace
		5-1-2 Workload		**outcome**, measure, staffing, effect, evaluation, characteristic, work environment, performance, workload, psychological
		5-1-3 Job satisfaction		**job,** satisfaction, stress, burnout, intention, turnover, user
	5-2 Institutional system	5-2-1 Institutional process		**process**, handover, bedside, implementation, structure, organizational, system, context, stage
		5-2-2 Decision-making & Participation		**participation**, family, HCP, decision-making
		5-2-3 Resources		**hospital**, administrator, clinic, EMR, adoption, employee, indicator
	5-3 Activity for patient safety	5-3-1 Threat & Effectiveness of Patient safety activity		**safety**, **patient safety**, incident, threat, compromise, efficiency, effectiveness, evidence, commitment, manager, injection, technique
		5-3-2 QI activity related with Patient safety		**QI**, initiative, effort, QSEN, improvement, activity

ICU=intensive care unit; IV=intravenous; OR=operating room; RN=registered nurse; ER=emergency room; NP=nurse practitioner; EBP=evidence based practice; UTI=urinary tract infection; HAI=healthcare-acquired infection; CLABSI=central line associated blood stream infection; PICCs=peripherally inserted central catheters; QI=quality improvement; HCP=healthcare provider; EMR=electronic medical record; QSEN=Quality and Safety Education for Nurses

The keywords within each group were presented in the order of the highest degree of centrality